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MS0001: Social Media and Export Innovation: The Role of Digital Leadership, Digital Entrepreneurial Orientation, and Organizational Capabilities

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Social media and export innovation: The role of digital leadership, digital entrepreneurial orientation, and organizational capabilities

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Abstract

In this study, we focus on the key question – What roles do digital leadership, digital entrepreneurial orientation, and organizational capabilities play in the social media – innovation conceptualization in the context of export enterprises? Building on the innovation literature, knowledge-based view theory, upper echelons theory, and organizational capabilities theory, our study proposes a new theorization consisted of social media, export innovation, digital leadership, digital entrepreneurial orientation, and organizational capabilities (absorptive capacities). In the conceptual model, we theorize a series of propositions for exploring the underlying logic behind the social media - innovation paradigm under moderating and mediating perspectives.

Keyword: Export Innovation, Social Media, Digital Leadership, Digital Entrepreneurial Orientation, Organizational Capabilities.

1. Introduction

With the widespread of digitalization in business in the past decade, social media usage has become a must for businesses around the world (Ainin et al., 2015). Researchers have highlighted the influence of social media usage on international business and export marketing strategies (e.g., Alarcón-del-Amo et al., 2018), as these applications help firms reduce the barriers of distance and time between the supply and demand sides in the international market. Hence, through the enlargement of social media usage, exporting companies to date have had a greater opportunity when conducting business internationally. Extant research finds social media usage beneficial for companies' marketing campaigns (Baum et al., 2019), driving new product development (Nohutlu et al., 2022), and leading to growth in export performance (Alarcón-del-Amo et al., 2018). However, despite this development, when and how social media usage influences export innovation still remains undiscovered.

A review of recent studies reveals several key gaps that need to be filled. First, a review of the innovation literature shows that existing research has assessed the influence of social media on innovation; however, examining such a relationship in the context of exporting firms is still uncovered in the literature (e.g., Alarcón-del-Amo et al., 2018). Second, the majority of existing research on innovation potential for organizations arises from problems and queries rather than from a supporting innovation perspective (e.g., Patroni et al., 2022). As such, it is still unclear whether the social media – innovation conceptualization is affected by firms' online customers' problem-solving and handling customer queries abilities. To this part, research needs to investigate the moderation role of key factors such as digital leadership (e.g., linkage between digitization and leadership) in the social media – export innovation paradigm. Third, recent studies have also focused on the influence of entrepreneurial orientation on organizations' innovation (Kraus et al., 2023); however, it still remains unknown when and how firms' digital entrepreneurial orientation plays in the social media- export innovation paradigm. Lastly, to strengthen the social media- innovation paradigm, existing studies point out several factors, including managerial learning networks (Corral de Zubielqui & Jones, 2019), multiple digital channels (Torres de Oliveira et al., 2020), absorptive capacity and knowledge transfer effectiveness (Zhang et al., 2020), and strategic flexibility (Zhang & Zhu, 2022). Despite this

development, it is still unclear whether organizational capabilities such as absorptive capacities play a mediating role in the social media – export innovation relationship.

To address these important gaps in the existing literature, this paper aims to make a number of key contributions. First, this paper conceptualizes social media usage and export innovation relation from mediating and moderating perspectives. Second, by examining the moderation role of digital leadership and digital entrepreneurial orientation in the relationship between social media and innovation, our research adds new insights into the body of knowledge concerning social media usage and export innovation (Papa et al., 2018). This new finding provides new research directions on the infancy development of digital entrepreneurship in social media and innovation framework (Kraus et al., 2019a). Third, by exploring the mediating role of firms' absorptive capacities in the social media usage and export innovation framework, our study adds new findings to recent research focusing on social media-based knowledge sourcing and innovation performance (Tippakoon & Jiang, 2022).

2. Literature and framework

2.1 Theoretical background

In this research, we based on the combination of four extant theories and literatures to explain our conceptual model. First, the literature on innovation suggests that acquiring knowledge from a variety of external sources allows businesses to remain competitive in a fast technology changing world and a highly dynamic market (Vivas & Barge-Gil, 2015). Second, previous research using knowledge-based view theory shows that when enterprises possess knowledge about technology, markets, and internationalization, they can generate innovation and gain a foothold in the global market (Adomako et al., 2021). Hence, we consider social media platforms as a pool of knowledge where exporters can gather information and knowledge about international markets thanks to customer engagement on social media platforms, which drives to innovations. Third, we draw from upper echelon theory to link digital leadership and digital entrepreneurial orientation as the moderator of the relationship between social media usage and export innovation. Upper echelon theory posits that the characteristics of top executives can significantly influence corporate decisions and their outcomes (Hambrick, 2007; Hambrick & Mason, 1984). Although previous research applying the theory of upper echelons has

often focused on demographic traits (Hambrick, 2007), a number of recent studies have emphasized deeper characteristics such as top executives' characteristics' influence on enterprise innovation (Ali et al., 2023; Memon & Ooi, 2023). Fourth, organizational capabilities theory is founded to explain the mechanism on how firms can turn external knowledge from social media into export innovation. Innovation outputs have been proven to be related to the organization's ability to engage new sources of knowledge or to connect with existing sources of knowledge in innovative ways (Ferraris et al., 2017). Based on this theorization, we postulate that exporters can utilize their organizational capacity, as determined by absorptive capacities, to achieve firm innovation via social media usage. Based on the indicated theories and literature, we draw our propositions, which are outlined in Figure 1.

2.2 Conceptual Framework & Research Propositions

2.2.1 Social media usage and export innovation

The trend of businesses using social media platforms for innovation purposes is increasing (Bhimani et al., 2019). Social media can be used in different stages of the innovation process, from generating idea (Mount & Martinez, 2014), developing product (Rautela et al., 2021), to launching new product (Roberts et al., 2017). Limited has examined the relationship between social media and export innovation. For example, Shen et al. (2023) explore the role of internetization strategies in Chinese exporting firms. Their study indicates that internetization may stimulate exporters' innovation activities. Therefore, based on existing research findings, we postulate that social media usage are likely to affect export innovation.

Proposition 1. Social media usage positively affects to export innovation.

2.2.2 Digital leadership in the relationship between social media usage and export innovation

Research concerning the effect of digital leadership on innovation has mainly focused on a number of aspects: innovation capability (Mihardjo et al., 2019), innovation management (Mihardjo et al., 2019; Wasono & Furinto, 2018), exploratory innovation (Wang et al., 2022), open innovation (Fatima & Masood, 2023), and innovation performance (Benitez et al., 2022). Based on existing research findings, we suggest that digital leaders may help develop export innovation capabilities because such

abilities can embrace the latest and relevant digital information that is needed for international market and innovation development through social media usage.

Proposition 2. Digital leadership positively moderates the relationship between social media usage and export innovation.

2.2.3 Digital entrepreneurial orientation in the relationship between social media usage and export innovation

Despite the significant benefits of social media, several research demonstrate that the effect of social media usage on innovation poses a few challenges. The huge amount of unstructured data (Moe & Schweidel, 2017) makes it difficult for companies to gather relevant data and prepare it for analysis in a systematic way. Also, “fake news” on social media (Pandey et al., 2022) has a negative impact on a company’s decision-making. Social media is dynamic and requires constant management attention (Silva & Elo, 2018). To avoid the traps in social media usage, we postulate that firms’ digital entrepreneurial orientation can leverage the effect of social media usage on innovation because leadership with a digital entrepreneurial orientation can minimize the negative effects of social media usage, such as unstructured data, fake news, and so on. Furthermore, digital entrepreneurial orientation can also help firms monitor the rapid changes in the business environment that can influence the effect of social media on export innovation. As such, extant research has found a positive relationship between digital entrepreneurial orientation and corporate innovation. Based on this conceptualization, we postulate that digital entrepreneurial orientation has a positive moderation role in the social media usage and export innovation relationship (Wang et al., 2022).

Proposition 3. Digital entrepreneurial orientation positively moderates the relationship between social media usage and export innovation.

2.2.4 Social media usage and organizational capabilities

Much of the existing literature identifies the organizational capabilities required for the current digital business environment (Konopik et al., 2022). They are also important drivers of innovation (Corral, 2003). According to Corral (2003), organizational capabilities are identified as the procedures and

policies that help exploit an enterprise's resources. There are a number of ways to measure organizational capabilities (Chabbouh & Boujelbene, 2022; Kafetzopoulos et al., 2023); among them, absorptive capacities are considered as the key component, particularly in making the most of social media usage to foster export innovation. Consequently, we have used absorptive capacities as the representative of a firm's organizational capabilities. Due to the accessibility and transparency of social media, the amount and variety of knowledge available to explore is increasing. The ability to absorb more diverse sources of knowledge enhances the absorptive capacities of the assimilation and absorption processes (Van de Vrande et al., 2011). In this vein, we argue that companies using social media platforms tend to approach more diverse external sources of knowledge, which in turn enable them to enhance their absorptive capacities. Therefore, we theorize:

Proposition 4. Absorptive capacities are positively influenced by social media usage.

In the mediation paradigm, research by Riana et al. (2023) on export-oriented SMEs shows that absorptive capacities partially mediate the impact of knowledge sharing on innovation. Not only does it help increase speed, but it also helps increase the frequency and level of innovation (Lane et al., 2006). We therefore postulate that absorptive capacities allow exporting firms to identify and realize the value of external knowledge through social media usage, eventually increasing the firm's export innovation.

Proposition 5. Absorptive capacities positively affect export innovation.

3. Concluding remarks

Many findings point out the positive influence of social media on innovation performance (Pérez-González et al., 2017) thanks to customer's co-creation (Hitchen et al., 2017). Despite this extant literature has shown minimal research regarding the effect of social media usage on export innovation. The growing importance of social media for export enterprises makes the field more challenging and interesting for practitioners and researchers. To advance the conceptualization that is postulated in this study, empirical research is needed. To achieve this, it is important to collect and assemble data from multiple sources and other necessary information, to maximize reliability of the research findings. In

this digital era, digital leadership, digital entrepreneurial orientation, and organizational capabilities (absorptive capacities) are needed to operate business with a global mindset and support a culture of innovation in exporting companies via the advantages of social media platforms.

To our best knowledge, this is the first theoretical research about social media's effects on export innovation. In particular, it is important to explore whether social media enhances organizational capabilities or whether digital leadership and digital entrepreneurial orientation moderate the effect of social media on export innovation. To achieve these tasks, it is vital to have a well-founded conceptual model that can be successfully operationalized to capture the paradigm of social media influencing export innovation under moderation (i.e., Proposition 2 and 3) and mediation (i.e., Proposition 4 and 5) perspectives.

4. Limitations and future research

This study has some limitations that warrants attentions of future research. First, it is important for future research to adopt a wider measurement for export innovation as this adoption can have a higher validity on this important output variable. Future research can consider the measurement of export innovation in terms of product innovation, process innovation, and administrative innovation (Chung et al., 2020) because these innovation measurements are validated empirically (Murray et al., 2011). Second, although the mediation role of organizational capabilities (absorptive capacities) are recommended here, it is still unknown whether other specific organizational capabilities such as digital capacity (Torres de Oliveira et al., 2020), or firm related organizational capacities (e.g., explorative and exploitative; Chung & Ho, 2021) can also play the same mediation role as outlined in this study. It is interesting for future research to explore these initiatives.

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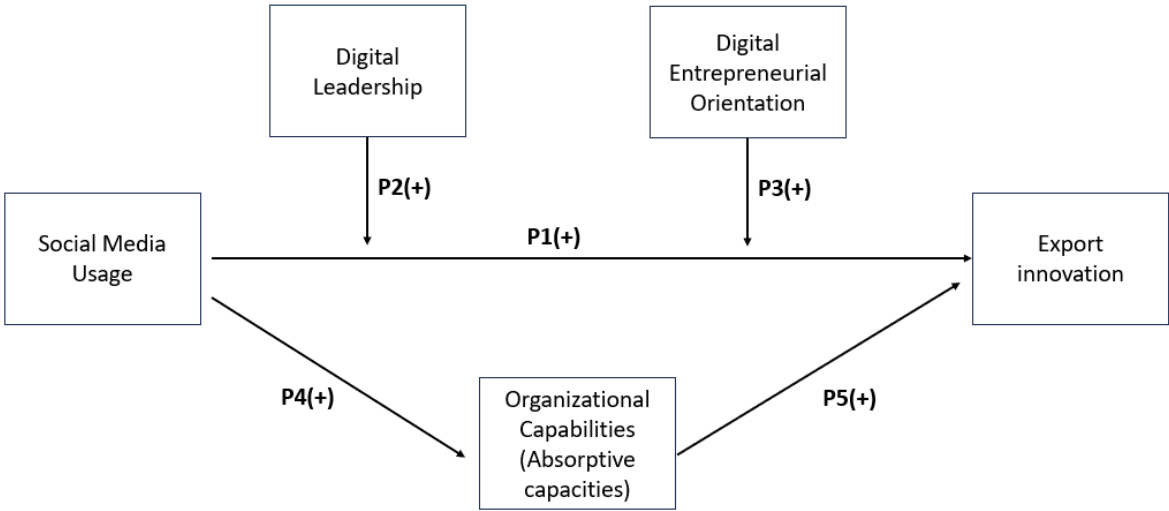
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Appendix
Figure 1 Conceptual framework.





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MS0002: IT Affordance Strategy, Business Networking and B2B Performance: A Multichannel Network Perspective

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IT affordance strategy, business networking and B2B performance: A multichannel network perspective

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Abstract

MCN (multi-channel network) institutions play a pivotal role in live streaming e-commerce. MCNs employ IT VMG (information technology visibility, meta-voicing, and guide shopping) affordance strategy to enhance the outcomes of live streaming activities. Despite this significance, research on its effect on B2B performance in the MCN industry remains scarce. Our study uses the experiences of 114 Chinese MCNs to explore a new conceptualization consisted of IT VMG affordance strategy, business networking and channel and economic performance. Our findings confirm the effect of IT VMG affordance strategy on B2B performance as well as the moderation role of business networking in the IT VMG affordance strategy-B2B performance framework. Our results have profound theoretical and managerial implications.

Keywords: Live streaming e-commerce, MCN (multi-channel network) institutions, Business networking, Organizational networking theory, Business performance.

1. Introduction

Live streaming e-commerce is an emerging marketing strategy that utilises various communication techniques for online commerce (Si, 2021). Multichannel Network institutions (MCNs) play a crucial role in live streaming activities and act as professional live streaming agencies (Li, 2021; Si, 2021). When operating in the B2B model, MCNs are responsible for managing the supply chain, facilitating live streaming activities, and other services for their principals (e.g., manufacturers and brand owners) (Yang, 2022; Wang et al., 2022). In the live streaming videos production, MCNs communicate with their customers (e.g., wholesalers and buying agents) and work to stimulate purchases (Wang et al., 2022). Engaging within such a B2B model, MCNs contribute to increasing sales revenues for their principals and collect a commission fee proportional to the live streaming sales (TOPKLOUT, 2023). Hence, it is essential to explore from the MCN perspective for mutual benefits of principals and MCNs.

MCNs employ diverse live streaming strategies to engage viewers and prompt purchasing behaviour (Si, 2021; Dong & Wang, 2018). Among them, the information technology (IT) affordance strategy is considered as vital one because it entails viewers' perception of informational and technical features (Dong & Wang, 2018). Extant research on IT affordance strategy has primarily focused on the components of visibility, meta-voicing, and guidance shopping affordances (i.e., IT VMG). Existing research confirms that IT affordance strategy has a positive impact on purchasing behaviour in live streaming activities (Dong & Wang, 2018; Saffanah et al., 2022; Sun et al., 2019). However, despite their usefulness, prior studies mainly examine their conceptual framework from a B2C (business to consumer) aspect, such as consumer buying motivation and action (Dong & Wang, 2018; Sun et al., 2019; Volkoff & Strong, 2017). The effect of IT affordance strategy on B2B performance remains unknown within existing literature (Volkoff & Strong, 2017). To address this key research gap, our study aims to broaden existing research scope to the B2B domain. Our research aims to explore when and how IT VMG affordance strategy influences B2B business performance (e.g., economic performance and channel performance). In addition, it is also unclear whether business networking moderates the relationship between IT VMG affordance strategy and B2B performance of MCNs. Guided by organizational networking theory (Chung, 2019; Park & Luo, 2001), our study aims to

investigate the moderating impact of business networking in the IT affordance strategy – B2B performance dyad in MCNs.

Our study intends to make two key contributions. First, our study offers novel insights by examining the direct effect of MCNs' IT VMG affordance strategy on B2B performance. This new finding can enrich contemporary B2B live streaming research. Based on this finding, MCNs can determine whether they can use IT VMG affordance strategy to achieve their B2B performance goals. Second, grounded in organizational networking theory (Chung, 2019; Park & Luo, 2001), our study postulates a moderation role of business networking in the IT VMG affordance strategy and MCNs' B2B performance. In light of this study's findings, research on the organizational networking theory can determine whether they should consider business networking and IT VMG affordance strategy in their future research conceptualization formulation (Chung, 2019; Park & Luo, 2001). Depending on the outcome of our research, IT VMG affordance strategy and MCNs research may also decide whether business networking should be included in their conceptual framework (Mitrega et al., 2012; TOPKLOUT, 2023) and whether enterprises should commit to the development of business networking.

2. Literature and framework

2.1. Literature review

Dong and Wang (2018) define visibility affordance as the accessibility of product details, meta-voicing affordance as enabling customers to express their voice about products, and guidance shopping affordance as the ability to offer customized services. Business performance is divided into economic performance and non-economic performance (Cavusgil & Zou, 1994). Economic performance evaluates the economic outcomes of firm operations (Cavusgil & Zou, 1994). Additionally, Morgan et al. (2004) stress the importance of channel performance in the B2B context. Extant organizational networking theory research reveals the role of business networking, which can help firms to implement their business strategy, such as via marketing orientation (Chung, 2019; Park & Luo, 2001).

2.1.1. IT affordance strategy and economic performance

Existing research suggests that IT VMG affordance strategy can mitigate customer uncertainty, thereby improving actual transactions during live streaming videos (Dong & Wang, 2018; Saffanah et al., 2022; Sun et al., 2019). In such situations, MCNs can conduct IT VMG affordance strategy to provide informational supports (e.g., product presentations, e-WOM, and customized recommendations) (Dong & Wang, 2018; Sun et al., 2019). Informational supports are confirmed to reduce customer uncertainty in live streaming activities (Mao et al., 2022). It is suggested that once customers capture supportive affordances, they would increase the trustworthiness of organizations (Zhang et al., 2022) and portray MCNs as low-risk entities. This, in turn, can lead to customer buying decisions and subsequently lead to superior economic performance of MCNs (Saffanah et al., 2022).

H1: IT VMG affordance strategy positively influences the economic performance of MCNs.

2.1.2. IT affordance strategy and channel performance

Existing IT affordance research demonstrates that visibility affordance and guidance shopping affordance can foster customer trust and experience satisfaction (Zhang et al., 2022). Likewise, meta-voicing affordance can promote interactivity and emotional support between live streamers and customers (Dong & Wang, 2018; Saffanah et al., 2022). Consequently, IT VMG affordance strategy boosts overall satisfaction and, thereby, enhance MCNs' channel performance (Morgan et al., 2004). Moreover, TOPKLOUT (2023) notes that IT VMG affordance strategy can offer timely supportive information to enhance communication efficiency and social proof, both are considered crucial for B2B firms' reputation (Mao et al., 2022; Sun et al., 2019). Based on this discussion, it is postulated that implementing IT affordance strategy enhances overall satisfaction, reputation, and channel performance for MCNs.

H2: IT VMG affordance strategy positively influences the channel performance of MCNs.

2.1.3. IT affordance strategy, business networking and business performance

Organizational theory researchers provoke that extensive business networking is important for external knowledge acquirement from channel members (Chung, 2019; Park & Luo, 2001; Mitrega et al., 2012). Channel members such as B2B buyers and distributors can provide MCNs with current customer preferences for watching live streams, IT feature usage, and new IT features. They also

enhance MCNs to implement their IT VMG affordance strategy (Li, 2021; TOPKLOUT, 2023). For instance, MCNs can acquire novel industrial insights from business members in terms of fashion trends and popular styles that are important for formulating effective guidance shopping services to customers (Dong & Wang, 2018). When implementing more effective IT VMG affordance strategy such as those supporting customer purchasing actions, MCNs can attain superior economic performance (Dong & Wang, 2018; Sun et al., 2018). High quality relationships between principals and distributors can also help MCNs to increase their firms' sales volume (Gensler et al., 2007; Mitrega et al., 2012). Furthermore, MCNs can gain external knowledge on distribution methods via intensive interactions with distribution channel members (Li, 2021; TOPKLOUT, 2023). As such, intensive interactions with distribution channel members can help MCNs to achieve their channel performance objectives. In an e-commerce industry, delivery efficiency is vital for gaining high customer satisfaction and strong business networking in the distribution channel can help MCNs to achieve this goal (Gensler et al., 2007). Taken together, strong business networking facilitates access to external intelligence and this advantage can help MCNs to improve the influence of IT VMG affordance strategy on business performance, both economic and channel performance.

H3: Business networking positively moderates the relationship between the IT VMG affordance strategy and MCNs' economic performance.

H4: Business networking positively moderates the relationship between the IT VMG affordance strategy and MCNs' channel performance.

2.2. Conceptual framework

This study presents the conceptual framework in Figure 1 which outlines how each hypothesis is postulated.

[Insert Figure 1 about here]

3. Research method

3.1 Sample and data collection

This study employs a cross-sectional quantitative method by focusing on the experiences of MCNs in China (Gardner & Lehnert, 2016). The sampling frame comprised reputable databases, including the

Taobao Live Streaming Ecological Development Report, the White paper on the development of China's MCN industry (TOPKLOUT, 2023), and assessable backend data resources of Chinese live streaming platforms (i.e., TikTok and Taobao). In early 2024, 500 MCNs were randomly selected and contacted via email and WeChat. A total of 114 valid responses were collected, with a response rate of 22.8%. This study covers a wide range of MCNs engaged in B2B live streaming in China, such as varied types, regions, and firm size, to ensure its representativeness and objectivity (Bell et al., 2018).

3.2 Measurement scales

The measurement scales of IT VMG affordance strategy have been measured by three elements; visibility affordance, meta-voicing affordance and guidance shopping affordance on a seven-point Likert scale (1=strongly disagree; 7=strongly agree) (Dong & Wang, 2018; Sun et al., 2018). Business networking is evaluated by relationships strength with related entities, such as principals, channel distributors, customers, and other business partners (1 = very little; 7 = very extensive) (Chung, 2019; Park & Luo, 2001). Economic performance is evaluated by economic metrics, including sales volume, return on investment (ROI), return on assets (ROA), and profit growth (Cavusgil & Zou, 1994). Channel performance is measured by the quality of relationships among channel members, reputation, distributor loyalty, and overall satisfaction (Morgan et al., 2004). Both forms of performance are measured by a self-evaluation seven-point Likert scale (1 = not satisfied at all; 7 = completely satisfied) and comparative seven-point Likert scale (1 = much worse; 7 = much better), to ensure robust results (Cavusgil & Zou, 1994; Morgan et al., 2004).

4. Results

The results of this study indicate a positive influence of the IT VMG affordance strategy on MCNs' economic performance (self-evaluation and comparative scale) ($\beta=0.010$; $\beta=0.042$) (H1). Moreover, the interaction of business networking and IT VMG affordance strategy also significantly enhances economic performance ($\beta=0.013$; $\beta=0.022$), suggesting the positive moderating role of business networking (H3). Additionally, the IT VMG affordance strategy positively influences MCNs' channel performance (self-evaluation and comparative scale) ($\beta=0.045$; $\beta=0.042$) (H2). Furthermore, the

interaction of business networking and IT VMG affordance strategy positively affects channel performance ($\beta=0.044$; $\beta=0.049$), supporting H4. In sum, all hypotheses are supported.

5. Conclusion

This study significantly advances current research in live streaming e-commerce, the MCN industry, business networking, and B2B performance. The results of our study provide profound theoretical and managerial implications. First, by focusing on the MCN industry, our findings reveal that IT VMG affordance strategy enhances both economic and channel performance of MCNs. These new results successfully extend extant research scope from a B2C to a B2B context (e.g., Dong & Wang, 2018; Volkoff & Strong, 2017). Second, by building on organizational networking theory (Chung, 2019; Park & Luo, 2001), this research confirms the moderating role of business networking in the IT VMG affordance strategy and B2B performance relationship. In light of these findings, MCNs are encouraged to develop their strong relationships with their business networking entities as this commitment can help MCNs to formulate and implement effective IT VMG affordance strategies and subsequently achieve superior economic performance and channel performance.

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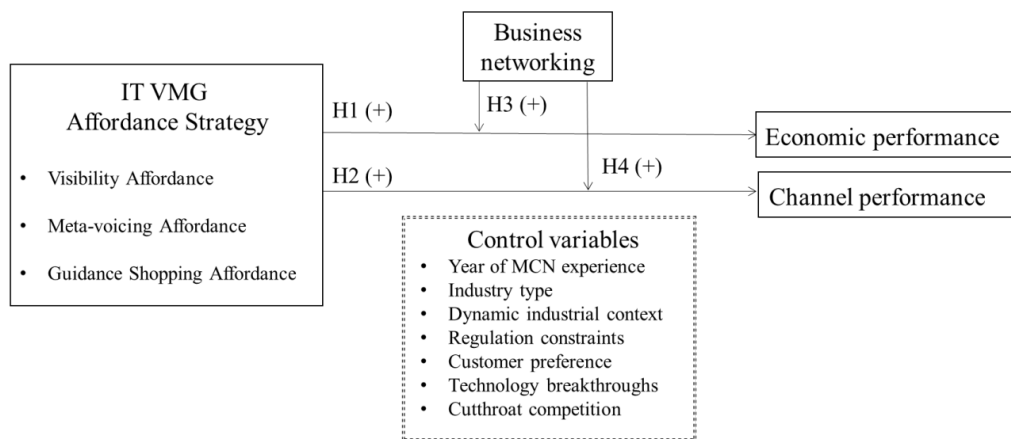
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Appendix

Figure 1: IT affordance strategy, business networking and B2B performance: A multichannel network perspective





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MS0003: International Business Management Curriculum in Thai Universities: What Are Missed Compared to the United States' Top International Business School?

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**International Business Management Curriculum in Thai Universities:
What Are Missed Compared to the United States' Top International Business School?**

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Extended Abstract

This study aims to find differences between Thai universities' international business management curriculum and that of the US first-ranked university having a global business major to recommend directions for improving those of Thailand. By using documentary research and comparison, this study found that Thai universities lack certain subjects, e.g., the business case for services offshoring, foreign market entry and growth, global stakeholder management, Islamic economics and finance, social networks and global leadership, market development and global strategy, and ethnographic methods in international marketing. Adding these subjects to the international business curriculum of Thai business schools is thus recommended to make them globally academically competitive.

Keyword: International Business Management Curriculum, Thai Universities, Global Business Education

1. Introduction

International business management is one of the major departments in the business school of many Thai colleges and universities. The first international business department was established at Assumption University of Thailand in 1990 to encourage the education of international business management and develop modern leaders and entrepreneurs [1]. Over the past 34 years, each Thai university has continuously improved its international business curriculum to be consistent with the market's changes and needs to ensure that the pedagogy in all courses can provide various views of international business operations, and that students can handle every global business challenge. This article will survey the undergraduate international business management curriculum of the top three Thai

universities having the international business department and identify what they lack compared to the university in the US which has the top ranking in the international business field – the University of South Carolina [2].

2. Objectives of Study

2.1. To compare and find differences between the curriculum of the US top-ranked international business management school and the three famous Thai universities offering an international business management baccalaureate degree.

2.2. To provide recommendations for improving the Thai international business management curriculum.

3. Research Methods

This article employs documentary research, acknowledged as a scientific research approach [3]. We gather information from various sources, for example, academic journals, research papers, online news, and trustworthy websites. Then, before the discussion is provided, we conduct a comparison which is used as a common research method with a distinctive characteristic that has long been prevalent in social science research [4].

4. Result and Discussion

4.1. What is the international business management curriculum?

International business management means diverse business operating transactions both in public and private sectors doing cross-border business, such as international trade (export and import of goods and services), international investment, joint venture with foreign companies by using existing resources and opportunities to achieve targets, including licensing, franchising, management contract, etc. Business environments are distinct according to different countries [5].

Curriculum refers to the educational management plan integrating various activities in order to develop learners to be compatible with the determined objectives. It is dynamic and modified along the

social change. A good curriculum must conform to students' and social needs and be appropriately flexible [6].

Therefore, a good international business management curriculum should provide knowledge, skills, and experience in operating transnational businesses in varied regional business ecosystems that are consistent with current social conditions.

4.2. What does the US top-ranked international business management look like?

According to the 2024 ranking of U.S. News & World Report, the University of South Carolina (USC)'s Darla Moore School of Business wins the first prize in the field of international business management. When we looked at its curriculum, we found that the required learning outcomes of this curriculum are in-depth functional capability in the business area, a strong understanding of the global business dimensions, excellent foreign language communication skills, realization of the cultural impact on the business conduct, and experience of living abroad. They design their curriculum to respond to these requirements by firstly requiring all students to pass the school's core subjects, e.g., finance, accounting, commercial law, economics, communication, management, information systems, statistics, and marketing. Secondly, all students must pass at least four advanced foreign language courses. Thirdly, apart from studying outside the US for one semester at an approved institution, students must pass the major course – Globalization and Business – and several major electives. Interesting major electives are (1) The Business Case for Services Offshoring, instructing how to formulate and professionally decide on a services offshoring initiative based on cost, benefit, risk, and strategic flexibility, (2) Foreign Market Entry and Growth, introducing international market selection, global market entry, and regional expansion strategies, (3) Global Stakeholder Management, teaching economic, political, psychological, sociological and managerial foundations of global stakeholder management and engagement in multiple countries and various industries, (4) Islamic Economics and Finance, providing an introduction to Islamic economics and financial systems and their relationship to international business and multinational enterprises, (5) Social Networks and Global Leadership, surveying social network theories to identify, build, and comply

with the social settings in multinational corporations, (6) Market Development and Global Strategy, theoretically and empirically exploring the roles of state and business in the development of emerging markets, economic reform, and the impact of business strategies on development, and (7) Ethnographic Methods in International Marketing, analyzing the relationship between anthropological and business, business cultures, and their impact on international business practices [7].

4.3. Glance at top three Thai international business management schools

We surveyed the top thirteen Thai universities [8] and investigated the top three universities having an international business management curriculum: Mahidol University [9], Thammasat University [10], and Kasetsart University [11]. We found that all of them lack two subjects the USC provides which are The Business Case for Services Offshoring and Islamic Economics and Finance. Furthermore, two of them do not provide the rest five USC-like courses as mentioned above. From my viewpoint, studying services offshoring is essential nowadays because it has a lot of benefits in doing international business, such as focusing only on core functions and capitalizing on affordable assets, decreasing cost while boosting profitability by delegating some services to other countries with lower wages, closer collaborating with regional clients, and establishing global presence [12]. Additionally, learning Islamic finance and economics is also important because it is expected that in 2050, the number of Muslims will increase from 1.7 to 2.7 trillion people, slightly following Christians accounted for 2.9 trillion. This means that Muslims will play a greater role on the world stage, including in economic terms. The economic growth among the Muslim population will be significantly higher than the world average. Therefore, businesses in various countries may have to adjust to respond to the Islamic lifestyle [13].

Apart from the two abovementioned subjects, teaching foreign market entry is also vital because it is a way to make a connection with the new customer base, reduce dependence on a single market, and take advantage of cost-efficiency in other countries [14]. Also, providing knowledge about global stakeholder management is crucial because it is a key skill for professionals working on global delivery projects like identifying, involving, and affecting the varied and frequently conflicting interests of

different groups and individuals invested in the project's results [15]. In addition, passing on knowledge about social networks and global leadership is also significant because social networks provide leaders with three unique advantages which are access to information and knowledge, access to diverse skill sets, and power [16]. Aside from that, educating market development and global strategy is noteworthy because expanding business internationally creates opportunities for increased sales and profits [17]. Finally, instructing ethnographic methods in international marketing is remarkable because it offers a detailed understanding of target audiences' attitudes, behaviors, and experiences, enabling brands to better tailor their products, services, and marketing strategies to meet customer needs [18].

5. Conclusion

All in all, Thai universities having international business management major should put or add seven subjects similar to that of USC in their curriculum. By implementing this, their students would have more skills to cope with new challenges in managing international business; and their academic rank would be higher in the global competition.

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Appendix

University of South Carolina	Mahidol University	Thammasat University	Kasetsart University	University of South Carolina	Mahidol University	Thammasat University	Kasetsart University
1. Globalization and Business		Global Environment of International Business	International Business Environment	16. Competitive Strategies in Developing Countries	Business Strategy	Strategic Management	Global Business Strategy
2. International Financial Reporting	Financial Accounting Managerial Accounting	International Accounting	Principles of Accounting International Accounting Systems	17. Global Competitive Analysis	International Business Management	Industrialization and Global Competitiveness of Firms	International Business Management
3. International Financial Management	Business Finance for Entrepreneurs	Business Finance International Finance Advanced International Finance	Financial Management I International Financial Management	18. Global Stakeholder Management		Business in a Changing World	
4. International Marketing	Principles of Marketing Global Marketing Strategy	Principles of Marketing International Marketing	Principles of Marketing International Marketing Management	19. Islamic Economics and Finance			
5. International Entrepreneurship	Business Innovation and Entrepreneurship	Modern Management and Entrepreneurship	Global Entrepreneurship	20. Comparative Innovation Systems	Business Innovation and Entrepreneurship	Special Topics in International Business 1-2	
6. International Information Systems	Management of Business Information	Business Analytics I-II Big Data and Business Analytics Business Intelligence and Analytics Artificial Intelligence	Management Information System	21. Intercultural Competencies for Working in International Teams	Diversity, Cross Culture and Expatriate Management	Culture and International Business	Cross-Cultural Analysis and Management Intercultural Business Communication
7. Research in International Business		Research Methodology	Basic Research Methods in International Business	22. Economic Globalization: Leadership and the Transnational Mandate	Leadership and Change Management in the Global Business	Global Environment of International Business	
8. The Business Case for Services Offshoring				23. Social Networks and Global Leadership	Leadership and Change Management in the Global Business		
9. International Human Resource Management	Human Resources Management	International Human Resource Management	International Human Resource Management	24. Market Development and Global Strategy	Business Strategy Internationalization Strategy		
10. International Trade Economics	Macroeconomics	Introductory Microeconomics Introductory Macroeconomics	Microeconomics Macroeconomics	25. Ethnographic Methods in International Marketing			International Business Operations
11. International Monetary Economics	Macroeconomics	Introductory Microeconomics Introductory Macroeconomics	Microeconomics Macroeconomics	26. Business in Latin America	Regional Business Study	Comparative Business Systems	Industry and Trade in South America
12. International Development Economics	Macroeconomics	Introductory Microeconomics Introductory Macroeconomics	Microeconomics Macroeconomics	27. Business in Asia	Regional Business Study	Comparative Business Systems	International Trade Business and Industry in ASEAN Industry and Trade in Asia
13. Foreign Market Entry and Growth	Global Marketing Strategy			28. Business in Europe	Regional Business Study	Comparative Business Systems	Industry and Trade in Europe
14. Cross-Cultural Behavior and Negotiations	Diversity, Cross Culture and Expatriate Management	Communication, Persuasive and Negotiation Skills	Cross-Cultural Analysis and Management International Business Negotiation	29. Business in Africa	Regional Business Study	Comparative Business Systems	Industry and Trade in Africa
15. Exporting and Importing		International Trade Operations	International Trade Theory Export and Import Management				



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MS0004: Building International Branding Capability in Small and Medium Enterprises

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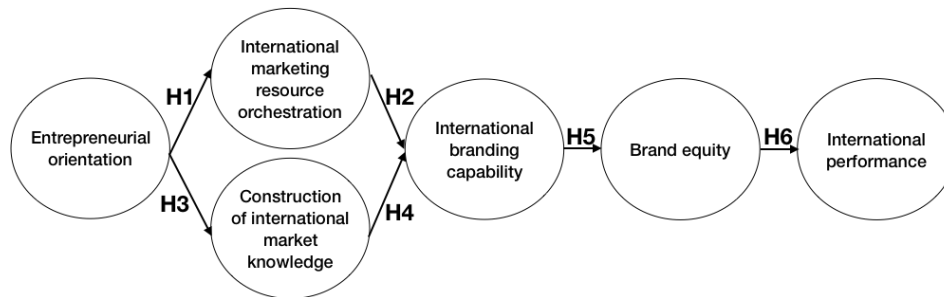
Building International Branding Capability in Small and Medium Enterprises

INTRODUCTION

The role of marketing capabilities in achieving superior firm performance has garnered significant interest (Day, 1994; Morgan, Feng, & Whitley, 2018). Among these, branding capability is particularly crucial for maximizing performance in international business (Altshuler & Tarnovskaya, 2010; Samice, Katsikeas, & Hult, 2021). Branding capability acts as a dynamic capability, enabling firms to craft superior brand strategies and build strong brands through market legitimacy and relational assets (Aaker, 1991; Keller, 1993; Gromark & Melin, 2013). For SMEs, which face the liabilities of smallness and outsidership, branding capability is vital for gaining market legitimacy and fostering business relationships (Leek & Christodoulides, 2012). It helps SMEs differentiate themselves, enhancing marketplace awareness, distinctiveness, and loyalty (Aaker, 1996; Kotler & Pfoertsch, 2006). Thus, branding capability is a key driver of international performance for SMEs, mitigating inherent disadvantages (Knight, Moen, & Madsen, 2020; Pelham, 2000).

However, previous research has not adequately addressed the empirically validated knowledge about international branding capability for SMEs, which is essential for building strong brands in international markets (Wong & Merrilees, 2007). This gap is significant, considering the different approaches small firms take compared to large firms in marketing and branding (Bocconcelli et al., 2018). Neglecting branding capability likely contributes to the failure of many international SMEs (Altshuler & Tarnovskaya, 2010). This study aims to empirically validate a theoretical framework for international branding in SMEs, drawing on the capabilities view (Alden, Steenkamp, & Batra, 1999; Homburg et al., 2014; Keller & Swaminathan, 2020). We introduce the construct of international branding capability, defined as a firm's ability to develop business networks, differentiate brand positioning, and leverage brand-related assets. This capability is crucial for creating differentiation advantages and enhancing brand equity in international markets. International performance is measured by profitability, market share, growth, ROI, and customer satisfaction. We also examine the

roles of entrepreneurial orientation, international marketing resource orchestration, and market knowledge in developing branding capability, leading to superior international performance for SMEs. The proposed conceptual framework is presented in Figure 1.



LITERATURE AND FRAMEWORK

Entrepreneurial orientation significantly influences firms' ability to leverage international marketing resource orchestration, enhancing competitive advantage through effective utilization of existing resources (Ireland, Hitt, & Sirmon, 2003). Entrepreneurial firms systematically and swiftly apply learning to develop capabilities and respond to opportunities, thereby increasing innovative capacity (Slater & Narver, 1995; Zhao et al., 2011). This internal capability development is less likely to cause conflicts across functions (Kogut & Zander, 1992). In resource-constrained international SMEs, entrepreneurial orientation drives internal searches for adaptable business models, facilitating effective international marketing resource orchestration (Dess et al., 2003).

Hypothesis 1. Entrepreneurial orientation positively relates to international marketing resource orchestration capability.

Drawing from prior studies, we argue that international marketing resource orchestration, reflecting a firm's capacity to develop new international marketing knowledge and capabilities, enhances innovation capacity and supports successful international expansion through experiential learning (Gebauer, Worch, & Truffer, 2012; De Chematony, 2010). This research emphasizes strategic innovation in branding, positing that high learning capacity improves a firm's ability to

develop branding capability, leading to superior performance (Merrilees et al., 2011). For SMEs, international marketing resource orchestration is particularly crucial, as it helps overcome the disadvantages of limited resources and relational assets, enhancing international branding capability and contributing to long-term growth and survival.

Hypothesis 2. International marketing resource orchestration capability positively relates to international branding capability.

We argue that entrepreneurial orientation drives firms to effectively acquire international market knowledge and leverage it for value-adding practices, such as branding, to increase profitability. Entrepreneurial firms enhance awareness of market opportunities through social networks (Li & Calantone, 1998; Wiklund & Shepherd, 2003). In SMEs, entrepreneurial characteristics strongly influence the construction of international market knowledge and the identification of new opportunities, even before competition arises. Lacking substantial financial resources, small firms must leverage intangible resources and capabilities for international expansion. This aligns with research showing that external relationships provide SMEs access to critical knowledge and resources (McDougall, Shane, & Oviatt, 1994; Zahra, 2005).

Hypothesis 3. Entrepreneurial orientation positively relates to construction of international market knowledge capability.

Firms integrate external knowledge to support marketing activities (Day, 1994; Keller & Lehmann, 2006). Competent branding requires innovatory activities based on international market knowledge (Brodie et al., 2017; Wong & Merrilees, 2007). Knowledge generation in social networks aids brand development (Nguyen et al., 2015). Rather than merely possessing market knowledge, constructing it drives product development and value-adding marketing practices (Li & Calantone, 1998; De Clercq et al., 2012). A strong ability to construct external market knowledge enhances market orientation and brand development capacity (Krasnikov & Jayachandran, 2008). Thus, international branding capability,

built on valuable international market knowledge from relational capital, benefits SMEs facing outsidership and limited market power (Keller & Lehmann, 2006; Nguyen et al., 2015).

Hypothesis 4. Construction of international market knowledge capability positively relates to international branding capability.

This research suggests that international branding capability enhances brand equity (Aaker, 1991; Keller, 1993).

Branding capability involves creating and improving brand value through perceived product quality, customer loyalty, stability in competitive markets, and the ability to command a price premium (Aaker, 1996; Keller et al., 2008; Kotler & Pfoertsch, 2006). Brand equity thus represents sustainable competitiveness, as strong brands are difficult to replicate.

Branding capability creates market imperfections, increasing brand value and supporting competitive advantage in profitability, market share, and customer satisfaction (Aaker, 1991; De Chernatony, 2010). Consequently, international branding capability significantly contributes to brand equity (Wong & Merrilees, 2007; Merrilees et al., 2011), particularly for international SMEs.

Hypothesis 5. International branding capability positively relates to brand equity.

Brands identify and differentiate a firm's offerings, enhance reputation through brand awareness, image, and loyalty, and create entry barriers, contributing to brand equity (Aaker, 1996; Kotler & Pfoertsch, 2006; Mudambi et al., 1997).

Brands reduce transaction costs and buyer uncertainty, benefiting the firm (Aaker, 1996; Keller et al., 2008). Strong brands enable price premiums, directly impacting profits (Aaker, 1991; Mudambi et al., 1997). Thus, brand equity enhances financial performance and strengthens customer bonds. We propose that strong brands derive more revenue, profit, and shareholder value from their brand equity.

Hypothesis 6. Brand equity positively relates to international performance.

METHOD AND RESULTS

We conducted cross-industry field survey with international SMEs from Taiwan between June and October 2020. Firms were accessed through the authors' social networks within several industrial associations. Information was gathered from annual and disclosure reports. Invitations were sent by email, and the survey was conducted using pencil and paper questionnaires. Founders, CEOs, and marketing and branding executives were surveyed face-to-face by pairs of 20 business graduate students. The authors supervised the entire process. Key informants were asked to fill out the questionnaire with information for up to three of the most important foreign markets where they run businesses using their own brands. At the end, 419 valid data were retained for analysis.

We used SEM to assess the proposed model. The model satisfactorily fit the data ($\chi^2 [1989] = 3959.198$; CFI = 0.952, TLI = 0.913; RMSEA = 0.055 [90% CI: 0.053 0.057], SRMR = 0.059) with significant explanatory power: $R^2_{\text{Branding Capability}} = 0.455$, $p = 0.000$; $R^2_{\text{IMRO}} = 0.155$, $p = 0.000$; $R^2_{\text{CIMK}} = 0.123$, $p = 0.000$; $R^2_{\text{brandequity}} = 0.096$, $p = 0.000$; $R^2_{\text{DV}} = 0.071$, $p = 0.010$. All hypotheses were supported, as in the table shown below.

<i>Path</i>	<i>Path Coefficient</i>	<i>Standard Error</i>	<i>Significance P-Value</i>	<i>Effect Size (Full Sample)</i>	<i>95% CI [LL/UL]</i>
H1: Entrepreneurial orientation → International marketing resource orchestration	0.394	0.047	0.000	1.00	[0.302 0.486]
H2: International marketing resource orchestration → International branding capability	0.349	0.055	0.000	1.00	[0.241 0.456]
H3: Entrepreneurial orientation → Construction of international market knowledge	0.351	0.047	0.000	1.00	[0.258 0.444]
H4: Construction of international market knowledge capability → International branding capability	0.531	0.050	0.000	1.00	[0.434 0.629]
H5: International branding capability → Brand equity	0.310	0.044	0.000	0.91	[0.224 0.396]
H6: Brand equity → International performance	0.225	0.049	0.000	0.84	[0.128 0.321]
Indirect Effects:					
International branding capability → Brand equity → International performance	0.070	0.018	0.000	0.81	[0.034 0.106]
International marketing resource orchestration → International branding capability → Brand equity → International performance	0.024	0.007	0.001	0.86	[0.010 0.039]
Construction of international market knowledge → International branding capability → Brand equity → International performance	0.037	0.010	0.000	0.93	[0.016 0.058]
Control variables:					
Size	-0.090	0.051	0.076		
Age	-0.074	0.061	0.224		
Industry	-0.007	0.053	0.898		
Business type (B2B/B2C)	-0.115	0.062	0.066		

DISCUSSION

The role of internationalization in achieving sustainable growth for SMEs is well documented (e.g., Acosta et al., 2018; Karami & Tang, 2019; Lu & Beamish, 2006; Lu et al., 2010). However, knowledge on value-creating processes like brand-building for internationalizing SMEs is incomplete. Our study addresses this gap by defining international branding capability, identifying its development mechanisms, and providing insights into brand-building efforts and effectiveness for internationalizing SMEs. Drawing on the capabilities view, our findings suggest that specific firm capabilities support superior performance in foreign markets. We empirically validate that SMEs with high levels of international marketing resource orchestration and international market knowledge construction are more competent in developing international branding capability. This capability helps resource-constrained SMEs create value, such as brand equity, resulting in improved international performance. Answering the call to adopt a marketing mindset in international business expansion (Samiee et al., 2021), our study offers a strategic path for SMEs to achieve superior performance by building a strong international brand. Next, we discuss theoretical and managerial implications.

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MS0006: JPEX: Identifies the “Ponzi Scams”, Provides Fraud Prevention, and Offers Insights to Maintain Investor Confidence and Financial Stability in the Age of Digitalization

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JPEX: Identifies the “Ponzi Scams”, provides fraud prevention, and offers insights to maintain investor confidence and financial stability in the age of digitalization.

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Abstract

By analyzing the recent JPEX scam in Hong Kong, this paper found that its marketing framing approximates to that of a Ponzi Scheme. The paper attempts to provide precautionary measures to regulatory bodies in preventing its possible renaissances in the Hong Kong cryptocurrency market. Ponzi schemes, a form of investment fraud where profits are paid to earlier investors by using the capital recruited from investors that join the scheme later, have quietly emerged in the cryptocurrency market because of its decentralized, anonymous, and less regulated nature in the economic system.

Through a comprehensive literature review, the paper traces the historical origins and the essential characteristics of Ponzi schemes and highlights how sophisticated frauds can appear in the cryptocurrency market by using JPEX as an example. Detailed case analyses of JPEX and other similar schemes such as Forsage and Ezubao reveal some common operational nodes, deceptive tactics, and victim profiles, that illuminate monitoring challenges faced by regulatory watchdogs in combating these scams. The paper emphasizes the demand for establishing robust regulatory frameworks, addresses the importance of investor education, and proposes technologically oriented legal frameworks to detect and prevent these scams. By identifying these vulnerabilities, the research aims to contribute to the creation of a secure and trustworthy fintech ecosystem that ultimately promotes the sustainability of the development of cryptocurrency market in Hong Kong. The implications of this study extend beyond immediate fraud prevention and offers insights to maintain investor confidence and financial stability in the Hong Kong digital economy.



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MS0007: Using Developmental Expatriation as A Means of Internationalization: A Japanese Example

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Using Developmental Expatriation as A Means of Internationalization:

A Japanese Example

EXTENDED ABSTRACT:

We use the process of the internationalization of a Japanese company, and the stresses that it produced in human resource management (HRM), to explore the interaction of a specific element of internationalization strategy - developmental expatriation - and the way that it was used to create change in HRM back in the home base of the multinational enterprise (MNE). We argue that the case study may be typical of other organizations from outside the western world, in that the company did not assume that their ethnocentric HRM policies would be best transferred to the rest of their global operation, but rather that it would benefit the company to import HRM practices from the rest of world. We explore the role of developmental expatriation in that endeavor and its relationship with external environments.

Expatriation has been seen as a key feature of the management of global organizations (Gaur, Delios & Singh, 2007; Tan & Mahoney, 2004). By expatriation here we are referring to postings of (usually already employed) individuals to assignments in countries other than their own for a temporary period of time (McNulty & Brewster, 2017). From early examinations of expatriation assignments, such policies have been characterized as being for three broad reasons (Edström & Galbraith, 1977): Some expatriates are sent to other countries because the organization perceives a lack of necessary skills in a particular location and needs to fill that gap, some, perhaps most, expatriates are sent for reasons of coordination and control, and a small number are sent for developmental reasons. Over the years, other categorizations of reasons for companies to use expatriation have been developed (Harzing, 2001; Minbaeva & Michailova, 2004), but they all draw heavily from, or reflect, these classic three categories, even if using different words. Studies of developmental expatriation assignments (Caligiuri & Colakoglu, 2007; Dickmann & Doherty, 2010; Wang, 2023) have, to date, mainly been carried out in western MNEs and their findings may miss important features of developmental assignments in MNEs from the majority of countries in the world. Further, many of these studies have referred specifically to inpatriation studies, where expatriates have been brought into headquarters specifically to internalize corporate values (Harzing, Pudenko & Reiche, 2016; Sekiguchi, Takeuchi, Takeuchi, Nakamura & Ebisuya, 2019), which may not be

relevant if an MNE is unsure of its own values.

Developmental expatriation in a non-western setting may have different purposes and hence take different forms. It is clear that many non-western companies do not share the ethnocentric view of most western businesses that their local, headquarters (HQ), practices are almost invariably superior to those in the foreign subsidiaries and that the path to globalization lies through exhorting and encouraging the subsidiaries to adopt the policies and practices operationalized at HQ (Chung, Brewster, & Bozkurt, 2020; Pudelko & Harzing, 2007). That has been the focus of much international business and international human resource management literature and an underlying assumption in much of the extensive ‘transfer of knowledge’ literature about forward transfer to subsidiaries (Harzing et al., 2016; Kim, Reiche, & Harzing, 2022) or a reverse manner back to HQ (Peltokorpi, 2015; Peltokorpi, Froese, Reiche, & Klar et al., 2022). In fact, at least as far as human resource management is concerned, many non-western companies are enthusiastic about bringing foreign, western, practices, sometimes characterized as ‘global best practices’ (Pudelko & Harzing, 2007), into their own organizations.

We report on an end-to-end developmental expatriation system from its initiation until its closing, in a major Japanese MNE. To explore the issues, we provide a brief outline of the topic, explain our case study methodology, offer a historical review of the development of developmental expatriation in the company and discuss and draw conclusions about the interaction of macro and micro levels factors in determining the company’s approach and examine the way that organizational structures and procedures can support or act as barriers to international knowledge transfer. A list of interviews and the number of expatriates are shown below.

By examining the developmental expatriation program from its initiation to its closure, we conceptualize a model of developmental expatriation to transfer back knowledge acquired from subsidiary to HQ (see Figure 1).

Here, the model demonstrates how knowledge can be acquired in a subsidiary through developmental expatriation (knowledge acquisitions) and returned to HQ (knowledge retrieval). Knowledge transfer between HQ and subsidiary is characterized as a combination of knowledge internalization and externalization (Nonaka, 1995). In expatriation, those knowledge agents dispatched to subsidiaries to internalize newly experienced knowledge about international business: On repatriation, those agents are expected to externalize their

newly acquired knowledge within HQ. The socialization of tacit knowledge takes place through day-by-day interactions of those agents at a given location. During knowledge transfer, individual and organizational factors enable and constrain the success of knowledge creation and conversion through developmental expatriation and repatriation: Factors such as individual motivation, career aspiration, linguistic skills as well as organizational structures and processes, supervisors' understandings of knowledge, a need of communication between HQ and subsidiary. Our model proposes two theoretical implications to the developmental expatriation literature and knowledge management model.

First, developmental expatriation is a multilevel phenomenon, echoing calls for multifaceted analysis (Meyer et al., 2020). Initially, the developmental expatriate program was initiated as a national identity aspiration to promote Japanese internally as future leaders. Triggered by the environmental jolt of a possibly liberalized China market, the developmental expatriate program manifests as a cultural symbol. Such a sense of national identity crisis within subsidiary triggers the initiation of the developmental expatriation program for future young PCN leaders within Beta Japan. This adds the importance of national identity to the conditions that favor actual change to fill the gaps of HQ and subsidiary capabilities. The conceptual work of Birkinshaw and Hood (1998) reminded us that unbalanced capabilities between HQ and subsidiary are necessary to trigger action to fill such perceived gaps. Here, our model rather implies that emotional attachments may create sufficient conditions to trigger developmental expatriation at HQ.

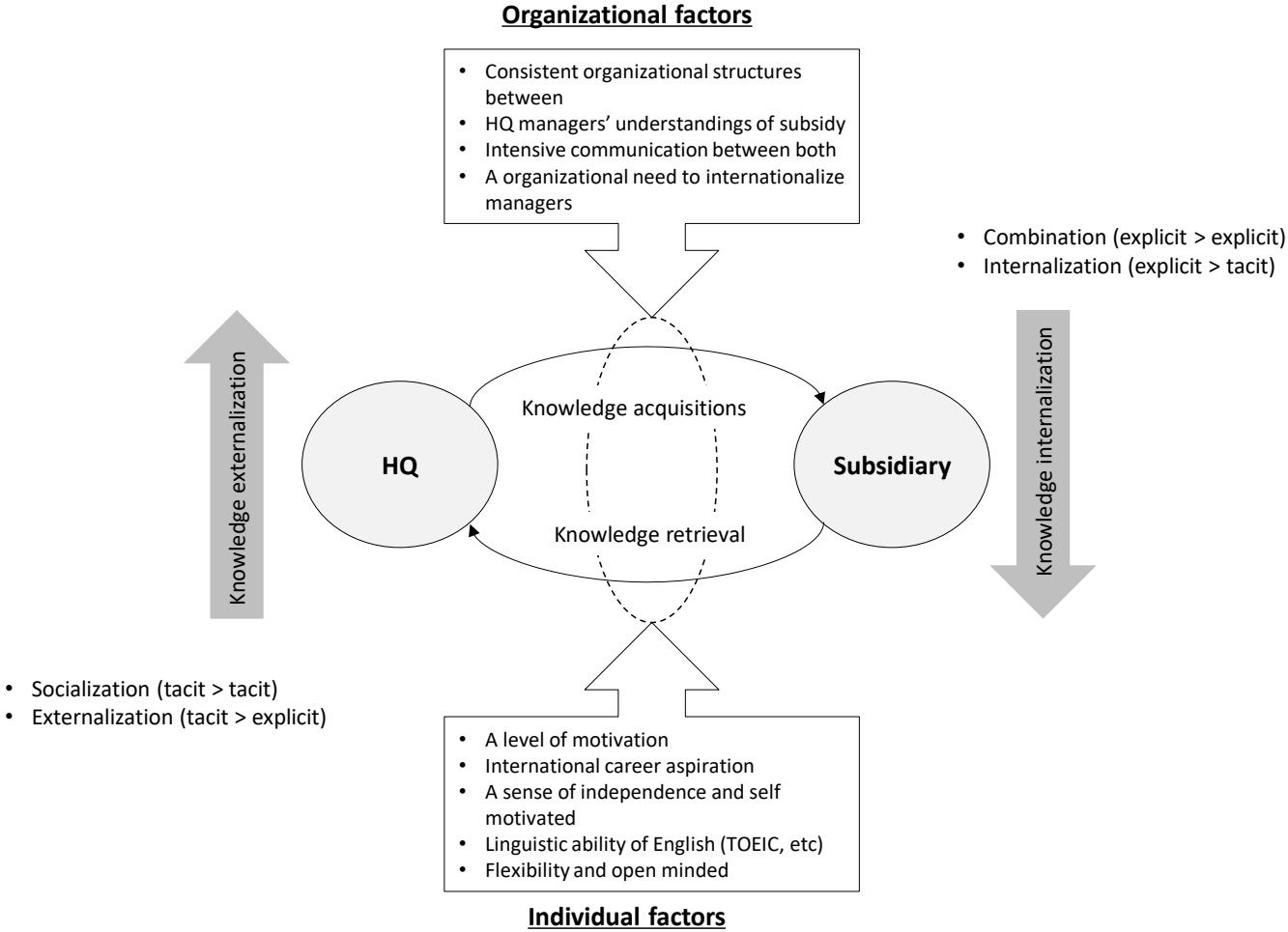
Second, our model identifies important organizational factors, that constrain knowledge retrieval through developmental repatriation back to HQ, confirming the SCEI model (Nonaka, 1994; Nonaka & Takeuchi, 1995) in the context of developmental expatriation. This was particularly evident in the first two stages of the program in which those knowledge actors attempted to bring acquired knowledge back to HQ yet found no space for their contributions of acquired knowledge. This was largely due to organizational factors, such as different organizational processes and structures, leading to a failure to transfer such acquired knowledge. Supervisors who dispatched DAs do not know how to utilize those repatriates when they returned so that their 'completely meaningless' treatments of repatriates hindered or prevented the retrieval and dissemination of newly acquired knowledge within HQ and the former developmental expatriates were demotivated, returning to HQ with 'nothing' [interview #33, 45, 48].

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Figure 1: A model of knowledge transfers through developmental expatriation





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MS0008: Reversal Post-Merger Integration (PMI): A Single Case Study of a Long Integration Process

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TITLE

Reversal Post-Merger Integration (PMI):

A Single Case Study Of A Long Integration Process

EXTENDED ABSTRACT

By and large, a Post-Merger Integration (PMI) had been assumed to be controlled by acquirer, not acquired. The current PMI literature assumes that acquirer tends to manage absorb acquired (i.e., Graebner et al., 2017; Devers et al., 2020). Indeed, each PMI itself is likely to be very different according to the type of a focal acquisition. Brueller et al., (2016) argue for three PMI temporalities as such as 1) annex and assimilate target (absorption), 2) harvest and protect target (preservation), 3) and link and promote target (symbiosis). Here, transfer of knowledge and practices in symbiosis may unfold more than in absorption and preservation because of given interactions between acquirer and acquired. This PMI temporality in repeated acquisitions, however, was not paid attention enough on the assumption that PMI is rather discussed as part of absorption. Treating PMI as part of absorption, Bresman et al. (1999) argued for two phases for unilateral transfer from acquirer to acquired first, and then reciprocal transfer as Birkinshaw et al. (2000), similarly, clarifying human integration first, and then task integration second. However, Barkeman and Schijven (2008) reminded us of the simple fact that acquisition does not stand alone but needs to be treated as a series of acquisitions for firm growth with somewhat restructuring acquired firms. Serendipitous learning (i.e., Graebner, 2004) may unfold in symbiosis because both acquirer and acquired have opportunities to interact and learn each other. In a longitudinal study, both deliberate and serendipitous learning may take place together within a process of repeated acquisitions, joint ventures, and divestitures (i.e., Bingham et al., 2015).

However, the IB literature implicitly raises a question to this assumed role of acquirer. Luo and Tung (2007; 2017) develop what they term a “springboard” theory show that internationalization through cross border acquisitions can enable subsidiary capabilities to be transferred back to headquarters and the home country operation. According to that theory, emerging economy MNEs tend to springboard to gain scarce overseas resources through strategic initiatives, such as cross-border acquisitions, due to institutional constraints in the home country. More recently, the conceptual work of Li et al. (2022) argued for the compositional views of the springboard as the springboard can be pursued by choosing one capability, not all of them – adaptability, ambidexterity, and amalgamation. It elaborates how to utilize each capability at each stage of the springboard process (Luo & Tung, 2017): 1) inward

internationalization; 2) radical overseas foreign direct investment; 3) capability transfer from host to home; 4) home-centered capability upgrading; and 5) global catapulting with stronger capabilities. Luo & Witt (2022) refined the process, adding another loop in the 1st stage moving between upgraded and continuous inward internationalization, technological & organizational learning, capability augmentation. This recent development raises the possibility that acquirer's organizational process and structure may adopt some and be even replaced by acquired firms' structure during a Post-Merger Integration (PMI) process.

In the PMI literature, the temporality is highly associated with organizational contexts of both acquirer and acquired. Bauer and Matzler (2014) argued that the success of absorption may depend on the degree of 'strategic complementarity' between acquirer and target in line with the degree of integration and cultural fit. This strategic complementarity can also be mediated by external parties, rather than internal stakeholders of both firms. Adopting a longitudinal qualitative analysis, Colman and Rouzies (2018) show that a set of actors, trade union in their case, play a key mediating role as boundary spanners, adding another set of influential actors to organizational settings and merger and acquisition (M&A) functions in PMI. Thus, transfer of knowledge and practice can dynamically be mediated by intergroup interaction in PMI processes as Kroon et al. (2021) argue for 'both hard and soft integration' with strategic and operational settings of both firms, denying the creation of tools and organizational (un)learning as one off event. Schweiger and Goulet (2005) raise the importance of cultural learning intervention during PMI processes, concluding the necessity of deep level cultural learning based on dialog and interactions. The success of learning may be due to the similarity of both acquirer and acquired as Dikova et al. (2010) argue that a former acquisition experience can positively affect next one when the target is institutionally less distant than others. Even targets in institutional less similar environments can be successfully integrated given "bi-cultural talent manager" (Liu, et al 2021). For emerging multinational firms may acquire and back integrate with target as 'post-acquisition reverse capability transfer' (Ai and Tan, 2020), prompting the importance of human side of acquisitions (Sarala et al., 2019).

This paper, therefore, set up a research question as to *how and why acquirer adopt acquired strategy and organizational processes in a reverse manner*. The paper adopts a single-case process study that provides processual views on phenomenon of a reversal of PMI in a series of acquisitions over time. It selects a Japanese multinational enterprise (MNE), who achieved the internationalization through cross border acquisitions. Two major acquired firms were global mega competitors whose headquarters were

in the US and UK while the MNE It identifies four phases of PMI in a reverse manner: 1) Cross border exchange, 2) cross border trial, 3) cross border executives, and 4) cross border (reversal) integration.

[Figure 1]

Our findings provide a long process of PMI in a reverse manner in which acquirer is being integrated into acquired firms global organizational structure and process. In the 1st cross border exchange, the acquirer starts to be accustomed to global best practice through dispatched expatriates and building corporate governance. Not only directors to manage acquired firm but also middle and front line managers were dispatched to acquired firm to deeply understand what a global firm does. In the 2nd cross border trial, acquirer's managers initiate the launch of its local brand through acquired firm's organizational structure and process. This is the first headquarters' international initiative in which home country managers face all redundant and inefficiency across both organizational units. Those home country managers started to have mirroring meetings between headquarters and subsidiaries to manage global business efficiently. In the 3rd cross border executives, a need to interact and then integrate is identified and raised to management executives, setting up global steering committee. Both organizational units of headquarters (acquirer) and foreign subsidiaries (acquired) are facing common issues of dealing with newly emerging technology in the international markets, raising a high need to communicate. In the 4th cross border (reversal) integration, as a result of failure to adopt new technology, headquarters were decided to be relocated to foreign subsidiary as those home country business becomes a single market underneath its foreign subsidiary organizational structure and process. This means that all home country business needs to report and communicate with the former foreign subsidiary in which non-Japanese managers operate.

Our findings provide two theoretical implications. First, in the IB literature, our findings connect PMI and springboard theory, adding institutional aspects to post-springboard activities to show how isomorphic forces affect both (Luo & Tung, 2007; 2017; Li et al., 2022). Shifting from mostly mimetic forces (1st exchange) to more normative forces (towards 4th integration), the evidence shows how isomorphic forces drive not only cross-border acquisitions but also parent company's HRM and organizational structure. Currently, springboard theory explains how and why internationalization can occur on the basis of economic motives, such as competition and acquisition of resources, but it does not fully capture the institutional aspects. Initially, Luo and Tung (2007) assumed that home country institutional constrains were a premise for firms to spring into internationalization, especially cross-

border acquisitions, yet later on, the relevant literature (Luo & Tung, 2017; Li et al., 2022) seems to leave out institutional isomorphic forces which have been widely noted by IB scholars (Hotho & Pedersen, 2012; Meyer et al., 2022).

Second, in the PMI literature, our findings provide how middle managers play an important role of PMI, which is not really paid attention in the current PMI literature. Middle managers are the ones who mobilize and initiate all possible changes in order to make the right degree of ‘strategic complementarity’ (Bauer and Matzler, 2014; Colman and Rouzies, 2018). Our evidence indicates a possible order of the PMI temporalities such as preservation (the 1st exchange), symbiosis (the 2nd and 3rd trial and executives), and absorption (the 4th integration) as suggested by Brueller et al., (2016). In addition, the temporality of PMI is managed by mainly middle managers, who notice redundancy and inefficiency through the renewal of local brand to global one. This also supports the importance of “bi-cultural talent manager” (Liu, et al 2021) in the MNE, which acquired western MNEs from the US and the UK. In particular, its importance may work in more soft integration (cross border exchange to trial), adding its nuanced role to the work of Kroon et al. (2021) argue for ‘both hard and soft integration’ with strategic and operational settings of both firms, In the evidence, soft integration comes first before hard integration so that headquarters nurture home country managers as bi-cultural managers.

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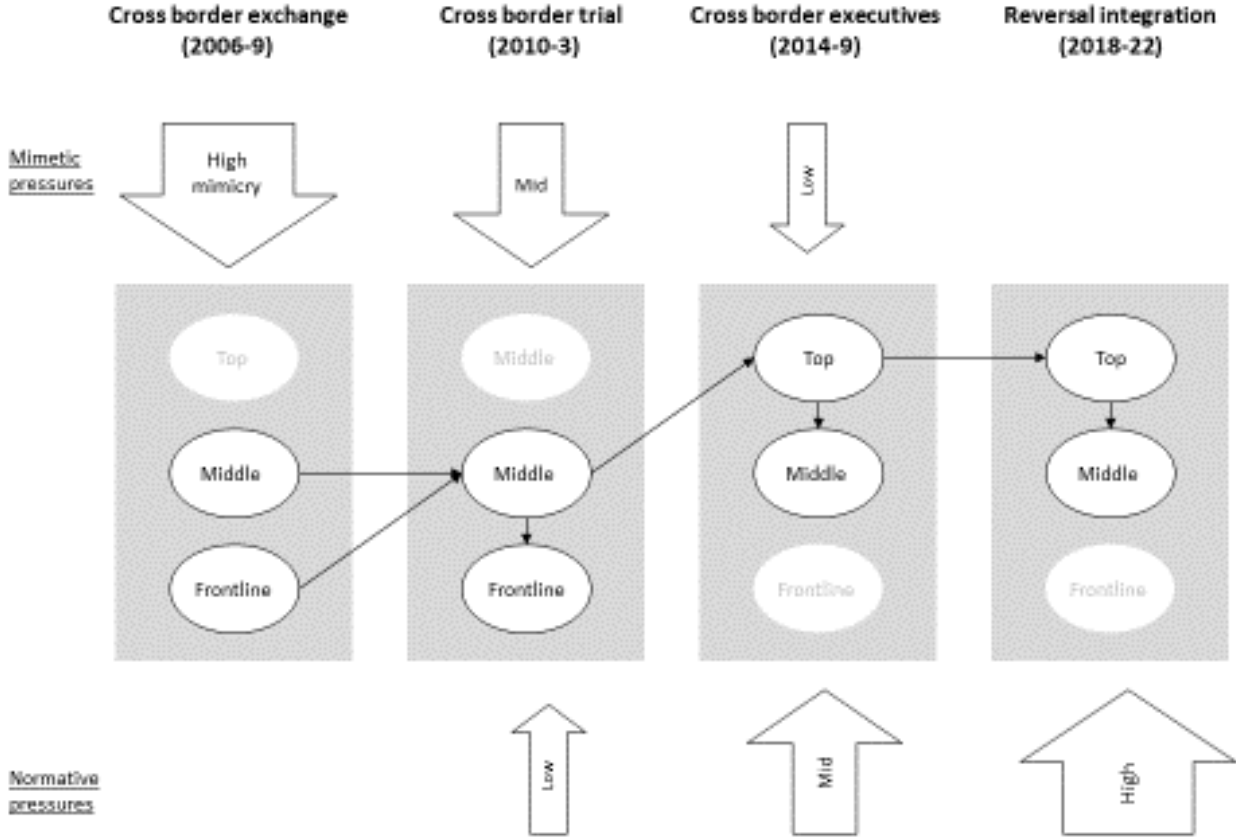
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Figure 1: A process model of PMI and middle manager





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MS0009: Are Local Platforms Better Than the Global Ones? A Comparison Study of Food Delivery Platforms in Japan and Indonesia

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Are local platforms better than the global ones? A comparison study of Food Delivery Platforms in Japan and Indonesia

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Extended Abstract

Recent studies on internationalization strategy for the platforms have primarily focused on the business model, neglecting the unique characteristics of users across regions. This comparative study examined Food Delivery Platforms in Japan and Indonesia to determine whether a platform's origin influences users' acceptance. Through two stages of analysis – Twitter content analysis and Structural Equation Modeling – our study showed that local platforms are more trusted than global ones. Furthermore, the study uncovered varying user attitudes between the two countries, signaling the need for tailored platform strategies in each market.

Keywords: Food Delivery Platforms, Internationalization strategy, platform strategy

1. Introduction

The rise of food delivery platforms (FDP) has garnered significant attention in the market, particularly following the onset of the global COVID-19 pandemic in early 2020 (Fielbaum & Tirachini, 2021; Paul, 2023; Wang et al., 2020). FDP enables customers to conveniently search and order from nearby restaurants without needing in-person visits. This multi-sided platform creates value for various parties involved: the technology serves as the intermediary, connecting restaurant owners with customers who

place orders and make payments through mobile applications.

Another notable feature of platform firms' entry into new markets has recently gained immense interest among scholars (Adner et al., 2019). Consequently, the entry strategy of platform businesses presents distinguished challenges. Prior research on entry strategy mainly examines multinational enterprises (MNEs) and multinational companies (MNCs) in terms of how enterprises build networks across different borders (Curchod et al., 2020; Ko et al., 2022). These studies also predominantly focused on creating similar business models regardless of regional distinctions and customer preferences. Limited evidence exists on platform-based businesses, facilitating borderless entry and customer response to such platforms.

In this study, we aim to shed light on this topic by exploring the following research questions: RQ1: Does the origin of FDP influence customers' attitudes toward acceptance of mobile application services? RQ2: Do attitudes toward use vary in different countries? Conducting a cross-market comparison may assist in identifying factors that influence customers' perceptions of utilizing the FDP, providing deeper insights into the dynamics of such business.

2. Literature and Framework

2.1. Business of Food Delivery Platform

A platform business provides a place for two or more sides (i.e., groups of participants) to interact and transact (Eisenmann et al., 2011). Prior research has identified two types of platforms: innovation (technology) platforms and transaction platforms (Autio et al., 2018; Gawer & Cusumano, 2014). These platform companies provide a multi-sided online marketplace to exchange goods, services, and information, highlighting the indirect network effects between interdependent groups of customers (e.g., buyers and sellers) (McIntyre et al., 2021).

This study focuses on the FDP, a platform that connects restaurants lacking delivery service with delivery personnel and provides them access to a logistics platform designed using machine learning algorithms to streamline delivery routes (Trivedi & Singh, 2021). Notably, delivery staff are often not

employed by the platform company and are independent contractors. Uber Eats and Doordash have been growing significantly in the US. Therefore, it is interesting to study further the sheer development of FDP across regions.

2.2. Internationalization of platform business

Interest in the international expansion of platform-based businesses has increased in recent years (Nambisan et al., 2019; Stallkamp & Schotter, 2021). For example, Uzunca et al. (2018) analyzed Uber and Airbnb's entry into the Netherlands, the UK, and Egypt, focusing on each country's institutional environment's effect on firms' strategies. Institutional strategy encompasses all market and non-market activities that utilize and influence regulatory, normative, and cognitive institutions to enhance a firm's competitive advantage.

However, these discussions on the mentioned issues are conceptual, and more empirical research needs to be conducted on how platform companies internationalize (Stallkamp & Schotter, 2021). It is necessary to add the perspective of competition between global and local platform firms from the users' perspectives. For example, in the case of FDP, the global Uber Eats and the local Demaecan compete against each other in Japan, and the global Grab Food and the local GoFood compete against each other in Indonesia. Based on the above, this study will compare the local (Demaencan, GoFood) and global (Uber Eats, Grab Food) FDPs in Japan and Indonesia.

3. Method and Results

3.1. Method

We divided the study into two phases. First, we gathered Twitter (X) data and performed content analysis on the collected tweets (Trivedi & Singh, 2021). Second, we developed a questionnaire based on the initial findings and distributed it to FDP users in Japan and Indonesia (Muk & Chung, 2015).

To retrieve tweet texts (in Japanese and Indonesian), we used Twitter API and inputted search keywords such as "FDP name (e.g., Uber Eats)" and "delivery staff. This approach allowed us to understand users' assessment of the ordering and delivery process rather than their general opinion about

FDP. We defined January-March, April-June, July-September, and October-December as 1Q to 4Q, respectively, and obtained a maximum of 300 tweets for every six periods from 4Q 2019 to 1Q 2021.

Subsequently, we conducted an online questionnaire survey targeting FDP users in Japan and Indonesia. In Japan, we used a research company's panel, and in Indonesia, we distributed the questionnaire through a mailing list. In total, we collected 713 respondents to complete the questionnaire.

3.2. Results

3.2.1 Twitter content analysis

The content analysis from Twitter revealed nine items that are occasionally tweeted by users. These items are categorized into three dimensions – personnel (PER), mobile applications or platforms (PLA), and restaurant (RES). The research framework (**Figure 1**) shows these items, which are considered external variables in the development of the questionnaire.

3.2.2 Structural equation modeling

We utilized Structural Equation Modeling Multi-Group Analysis (SEM-MGA) to compare data across multiple groups. This approach was chosen due to its suitability for comparing data among more than two groups. The results are presented in **Table 1**. It revealed that the origin of FDP significantly influences users' acceptance of the service. Demaechan and Gofood are statistically significant compared to Uber and Grabfood in the respective countries. Furthermore, our results indicate differing attitudes among users from different countries, as shown in **Table 2**. In Japan, users consider all external variables significant, while in Indonesia, only variable RES (incorporating price, variety of restaurants, and food selection) holds significance.

4. Discussion

The findings of this study have significant implications for previous research on platform competition and entry strategies. Traditionally, inter-platform competition has focused on either quantity or quality as the primary source of competitive advantage. However, our study introduces a new one by demonstrating that both platform and complement quality are equally important. We argued that local

platforms (Demaechan and Gofood) have an easier time establishing trust in the market than global platforms (Uber eats and Grabfood). Additionally, our research highlights the unique characteristics of user preferences, such as the tendency of Japanese users to place more excellent value on almost all measured dimensions compared to Indonesian users.

Furthermore, this study indicates that global technological competence, such as platform usability, can offer foreign platform companies an advantage when entering new markets, even without network effects across countries. While previous studies have emphasized the strength of the technological competence of global platform companies, our study suggests that it may not uniformly provide a competitive advantage across different countries. Understanding the diversity of user's preferences and the potential for securing a unique position within a country is crucial for successful foreign market entry.

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Appendix

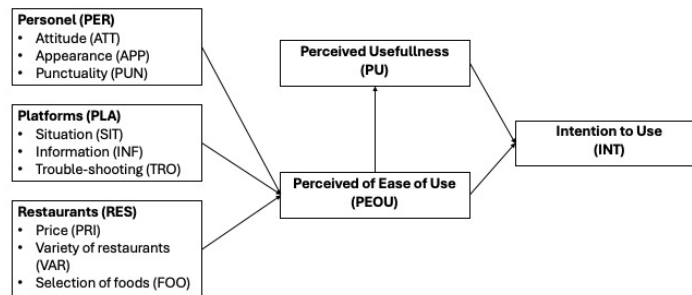


Figure 1 Research Framework

	Overall	By country			By platforms / firms		
		Japan	Indonesia	Uber	Demaechan	Grab	Gofood
PER → PEOU	-0.209	-0.549***	0.021	-0.667***	-0.724*	0.215	-0.948
PLA → PEOU	0.343***	0.562***	0.216	0.374*	0.815**	0.090	0.096**
RES → PEOU	0.769***	0.857***	0.599**	0.787	0.756***	0.525	0.782***
PEOU → PU	0.970***	0.954***	0.975***	0.983***	0.921***	0.964***	0.970***
PEOU → INT	0.103	0.855**	-0.532	0.373	0.871***	0.233	-0.715
PU → INT	0.588*	-0.158	0.585	0.374	-0.207	0.230	0.466
Observation	713	300	413	150	150	199	214

*** p < 0.000 ** p < 0.05 * p < 0.1

Table 1 Comparative model results

Table 2 Summary T-test of Covariance between groups

	Japan - Indonesia	Uber - Demaechan	Grabfood - Gofood
Chisq	3702.5	2382.1	2868.1
Chisq diff	89.97	37.42	91.52
RMSEA	0.085***	0.057	0.116***



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MS0011: Heterogeneity or Homogeneity? The Distance Paradigm in Shaping the Strategies for MNEs' Foreign Investment and Financial Institutions' Cross-border Lending

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Heterogeneity or Homogeneity? The Distance Paradigm in Shaping the Strategies for MNEs' Foreign Investment and Financial Institutions' Cross-border Lending

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Extended Abstract

This study examined how spatial distance and location conditions affect the investment decisions of multinational enterprises (MNEs) and the lending decisions of financial institutions. It compared the decision-making processes of both to identify the key influencing factors and developed a comprehensive theoretical framework. This study makes academic contributions to institutional theory and offers practical insights into MNEs' investment strategies in global markets. In addition, it guides financial institutions towards effective risk management and capital allocation in an interconnected context.

Keywords: distance, heterogeneity and homogeneity, investing and lending decision, international joint venture, formal and informal institutions

1. Introduction

The first goal of this study was to examine the factors affecting the overseas investment behaviour of MNEs. Specifically, it examined how investors in liquefied natural gas (LNG) project joint ventures (JVs), consisting mainly of multinational enterprises (MNEs), make overseas investment decisions through international JVs. This empirical study is based on the investment decisions of 84 JV sponsors for 97 LNG projects in 22 countries. Second, the study examined how financial institutions make financing decisions regarding the financing needs that arise when JV sponsors invest in LNG projects. This empirical study is based on the financing decisions of 176 financial institutions for 28 LNG projects in 13 countries for which financing data were available. As the financing data for the LNG project that JVs used for the first stage above were utilised, this study made possible a comparative analysis of the investment decisions of JV sponsors and the financing decisions of financial institutions. However, due to restrictions on the disclosure of financing data, only 28 out of 97 LNG project locations were used for the verification of financing decisions.

The motivation for using LNG project data is that a wealth of data is available for conducting empirical research on the decision-making of investors and financial institutions in LNG project JVs. The entire value chain, from natural gas extraction to the delivery of LNG to end-users, involves various stakeholders, including natural gas developers, liquefaction plant operators, LNG shipping companies, port operators, regasification plant operators, and end-users such as power companies (International Gas Union, 2022; International Group of Liquefied Natural Gas Importers, 2022). Referring to Yescombe (2013) and Ledesma (2016), the main stakeholders involved in the LNG projects are shown in Fig. 1 and Table 1.

(Insert Figure 1 and Table 1 here)

2. Literature and framework

Literature

The degree of dissimilarity between the institutional or cultural profiles of a company's home and host countries equals the distance that a company must overcome when doing business abroad (Ghemawat, 2001, 2011; van Hoorn & Maseland, 2016). The greater the distance between two countries (i.e. the

more different the institutional and cultural environments of the two countries are), the greater the cost of overcoming the distance for a company. In this respect, the concept of institutional and cultural distance is based on geographical distance (Hutzschenreuter et al., 2016)—for example, communication difficulties arising from transport costs and different time zones increase with greater geographical distance. Many of the costs are correlated with transaction costs (Hernández & Nieto, 2015). Institutional or cultural distance increases the costs of communication, coordination, monitoring, and integration (Tan & Mahoney, 2006), the number of multinational companies with subsidiaries and affiliates in different countries, and management complexity (Hutzschenreuter & Voll, 2008). The negative impact of distance on information flows reduces foreign investors' learning capacity (Johanson & Vahlne, 1977) and prevents them from utilising existing and absorbing new knowledge (Szulanski, 1996). This includes relocating to countries far from business practices (Dellestrand & Kappen, 2012) and relevant advanced technologies (Cui et al., 2006) exist. Distance reduces the competitive advantage of investing firms (Madhok, 1997) and increases the risk of losing legitimacy (Li et al., 2014). Consequently, the distance causes uncertainty (Makino & Tsang, 2011).

The impact of uncertainty on investment and financing in foreign markets pertains to gaining social legitimacy and efficiency in organisational management in institutional theory (Dacin, et al., 2007). First, by conforming to local norms and regulations, MNEs gain legitimacy and acceptance in foreign markets (Husted et al., 2016). Consequently, adopting established business practices can improve operational efficiency and reduce the risks associated with uncertainty (Lenny Koh et al., 2007).

Framework

The institutional, cultural, and geographical distances from host countries and partners can lead to uncertainties that reduce the efficiency of LNG project operations. Uncertainty is likely to create costs associated with the characteristics of each distance (Tihanyi et al., 2005). Table 2 summarises the costs of each distance considered in this study and their sources.

(Insert Table 2 here)

Space (distance) creates uncertainty and incentives to minimise the various costs arising from it. Therefore, when multinational companies and financial institutions make investment and financing decisions, their decision-making will inevitably show a negative relationship with space (distance) (i.e., they will invest and finance in objects with high homogeneity, that is, similar environments). This decision-making orientation is referred to as the *pursuit of homogeneity*.

However, it is possible to show both positive and negative relationships with space (distance). This means daring to make decisions about objects that are far apart in space (distance) and in different environments; however, what is the motivation? It is possible that the motivation behind the pursuit of heterogeneity is that there are benefits that outweigh the spatial costs arising from uncertainty and that the motivation is to acquire these benefits. In this study, this decision-making orientation is referred to as the pursuit of heterogeneity. Table 3 summarises the benefits of pursuing heterogeneity in investment and financing decisions based on the implications of the previous discussion.

(Insert Table 3 here)

MNEs may prefer to operate in an environment that is institutionally similar to that of their home country (Spencer & Gomez, 2011). This can minimise the risks associated with unfamiliar regulatory frameworks, cultural misunderstandings, and logistical challenges. MNEs' focus on stability and predictability suggests that they adopt a conservative approach to risk management. MNEs may concentrate resources in familiar environments to maximise efficiency and minimise risk. This is likely to result in more concentrated investment in fewer regions with similar characteristics. Based on these considerations, the following hypothesis was formulated:

Hypothesis 1. When investing in foreign markets, MNEs seek homogeneity vis-à-vis host country and partners to maximise concentration benefits.

Financial institutions diversify their portfolios and spread risk across different geographic, cultural, and institutional contexts. This move reduces the impact of adverse conditions in any single

market. Conversely, they also ensure stability and predictability because similar markets and partners typically offer familiar and manageable risks (Ellul & Yerramilli, 2013). Accordingly, financial institutions may adopt both heterogeneous and homogeneous strategies, depending on the circumstances. This mixed approach represents a more agile asset acquisition and risk-management strategy that balances the need for risk mitigation with the potential for higher returns. Financial institutions may favour heterogeneity when seeking higher returns, or homogeneity to ensure greater stability. The intention to diversify resources across diverse environments and optimise risk and return may underlie financial institutions' adoption of heterogeneity-seeking strategies that are not adopted by multinationals. Based on this assumption, the following hypothesis was formulated:

Hypothesis 2: When lending in foreign markets, financial institutions seek a combination of homogeneity and heterogeneity vis-à-vis host country and partners to maximise diversification benefits.

3. Method and results

Method

This study examined the investment decisions of 84 JV sponsors and the lending decisions of 176 financial institutions for 97 LNG projects in 22 countries. Tables 4–6 show the number of LNG projects, JV sponsors, and financial institution headquarters by region and country, respectively.

(Insert Tables 4, 5, and 6 here)

Tables 7 and 8 present the variable descriptions for the dependent, independent, moderating, and control variables for testing JV sponsors and financial institutions, respectively. The dependent variable is the equity share of each JV sponsor of the LNG project, the JV, and the other is a binary variable representing financial institutions' lending decisions. Data on the dependent variables were obtained from the International Gas Union (2022) and the International Group of Liquefied Natural Gas Importers (2022).

(Insert Tables 7 and 8 here)

The five independent variables comprise three distance-related variables between the JV sponsor/financial institution and the host country (geographic, institutional, and cultural) and two distance-related variables between the JV sponsor/financial institution and their JV partner(s) (institutional and cultural). We conducted a hierarchical multiple regression analysis for JV sponsors and a logistic regression for financial institutions to test for direct and interaction effects with the four moderators. Additionally, the decision-making factors of JV sponsors and financial institutions within subgroups (market and bank type), where host countries are classified by financial systems, are compared. To facilitate a holistic understanding of decision making, the results provide a comprehensive examination that considers both macro-level influences (financial system type) and micro-level factors (cultural and institutional distances).

Results

Tables 9 and 10 list the results of empirical studies on the direct effects of space (distance) and interaction effects with four adjustment variables on the decision-making of JV sponsors and financial institutions.

(Insert Tables 9 and 10 here)

Figures 2 and 3 compare the pursuit of homogeneity or heterogeneity regarding MNEs' investment decisions and financial institutions' lending decisions (geographical distance is not covered because it did not reach statistical significance). For formal and informal institutions in the host and partner countries, the figure shows whether actors choose an environment similar to their institutional environment (pursuit of homogeneity) or a different environment (pursuit of heterogeneity) based on the standardisation coefficients in coordinates. When the actor is located at a coordinate to the left of the centre, this is the case when the actor believes that the benefits of pursuing heterogeneity outweigh the cost of uncertainty created by the distance (cost of uncertainty < benefits of heterogeneity). Conversely, when the actor is located at a coordinate to the right of the centre, the actor believes that the costs of uncertainty produced by the distance outweigh the benefits of pursuing heterogeneity (costs of uncertainty > benefits of heterogeneity).

(Insert Figures 2 and 3 here)

MNEs both pursue homogeneity vis-à-vis the formal and informal institutions of the host country. Financial institutions, however, pursue homogeneity regarding the host country's formal and partner's informal institutions, and heterogeneity regarding the host country's informal and partner's formal institutions.

4. Discussion

The fundamental differences in decision-making between MNEs and financial institutions highlight the differences in their approaches to risk management, strategic objectives, resource allocation, adaptability, and market positioning, as revealed by their respective strategies. MNEs tend to prioritise operational efficiency, consistency, and stability by seeking a homogenous environment, whereas financial institutions balance the benefits of diversification and stability by mixing heterogeneous and homogeneous strategies. In this context, financial institutions can easily achieve asset and geographical diversification, whereas operating companies have limited options to expand their range of products and services and may be affected by the high transaction costs of adjusting their business portfolio (Acharya et al., 2002). Financial institutions face traditional challenges in terms of capital adequacy regulations linked to the risk of the assets they lend, and restrictions on branch expansion and asset management, which are sources of motivation for diversifying the geography and asset classes of their management resources (VanHoose, 2007).

This academic contribution is the result of a side-by-side comparative analysis of the differences in decision-making by MNEs and financial institutions, based on the same analytical conditions, with institutional theory as the axis. The contrasting strategies of MNEs, which pursue homogeneity in investment decisions, and financial institutions, which adopt an agile strategy that combines the pursuit of homogeneity and heterogeneity in financing decisions, have resulted in a focus on the fundamental differences in risk tolerance, operational objectives, and the regulatory environment.

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FIGURES

Figure 1. Stakeholders involved in the LNG project

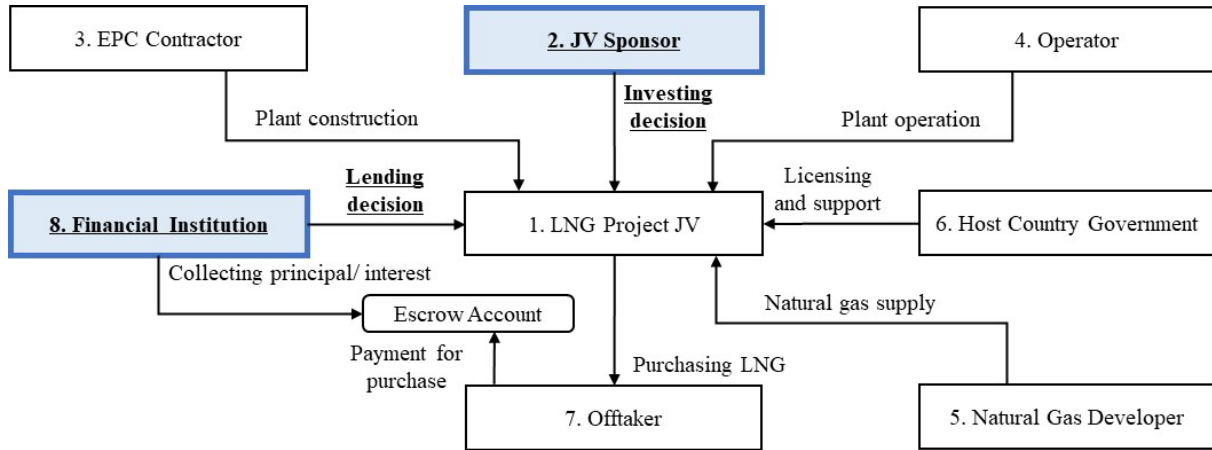


Figure 2. Homogeneity and heterogeneity position diagram (MNEs' investing decision)

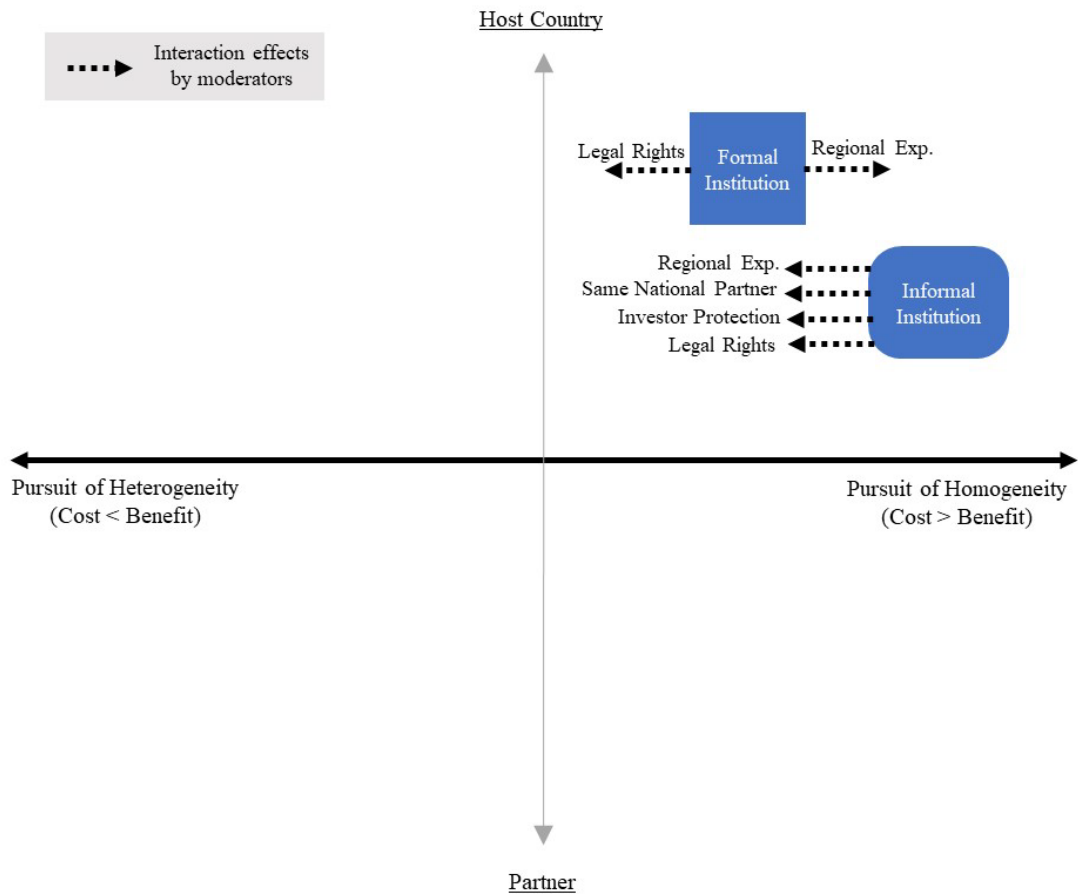
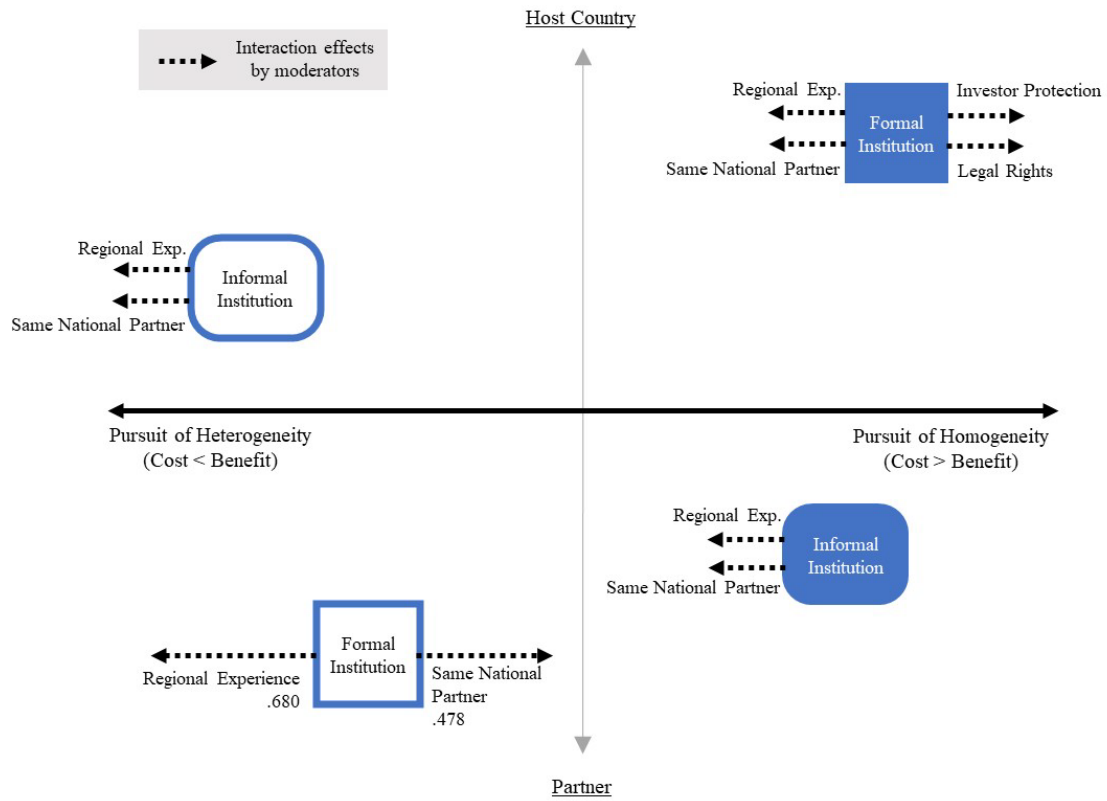


Figure 3. Homogeneity and heterogeneity position diagram (financial institutions' lending decision)



TABLES

Table 1. Description of the stakeholders in the LNG project

No.	Stakeholder	Description
1	LNG Project JV	Special purpose vehicle (SPV) established to own LNG project
2	JV Sponsor	Co-owners and co-managers by equity-investing in LNG Project JV
3	EPC Contractor	Company contracted to design, procure equipment, and construct LNG plant
4	Operator	Company operating and maintaining LNG project (LNG Project JV may act as Operator)
5	Natural Gas Developer	Company supplying natural gas as feedstock for LNG to LNG Project JV
6	Host Country Government	It grants various permits and licenses and often provides support with LNG Project JV
7	Offtaker	Company obliged to purchase LNG produced under long-term purchase agreement
8	Financial Institution	It finances to LNG Project JV. It includes banks, securities firms, insurance companies

Table 2. Potential costs arising from the uncertainty created by distance

Distance	Cost category	Assumed sources of cost
Institutional	Regulatory Compliance	Legal costs of interpreting and complying with foreign regulations. Fees and periodic administrative costs for obtaining the necessary licences and authorizations.
	Politics & Economics	Premiums and risk mitigation costs arising from political instability and economic uncertainty in host countries. Cost of managing exchange rate risk.
	Governance	Cost of aligning governance and operational standards with host country standards. Management and supervision costs to ensure compliance and monitor operations.
	Contract Enforcement	Costs related to the protection of IPRs in jurisdictions with weak contract enforcement. Legal and arbitration costs of resolving contractual disputes.
Cultural	Communication Barriers	Cost of professional translation to facilitate clear communication. Costs of cross-cultural training programs to reduce miscommunication.
	Management Practices	Cost of adapting management practices to local cultural norms. Cost of integrating diverse cultural practices into a coherent project management approach.
	Human Resources	Cost of recruiting local personnel who understand both the local and company culture. Cost of schooling, cultural adjustment assistance for expatriates.
	Stakeholder Engagement	Cost of building relationships with local communities and stakeholders. Cost for social responsibility measures in line with local cultural expectations and norms.
Geographical	Logistics & Transportation	Cost of frequent international travel for management, supervision and coordination. Cost of secure telecommunications systems to facilitate long-distance communication.
	Time Zone Differences	Cost of coordinating activities and meetings across different time zones. Cost for operational delays due to staggered communication and decision-making processes.

(Excluding geographical distance to host country as it is not subject to hypothesis testing)

Table 3. Potential benefits of pursuing heterogeneity

Distance	Benefit category	Assumed sources of benefit
Institutional	Regulatory Risk Diversification	In countries with different regulatory environments, One is less exposed to risks associated with changes in the regulatory and political situation in one country, which can provide advantages, such as tax incentives, subsidies and deregulation.
	Enhancing Compliance-Governance	Exposure to diverse institutional practices helps adopt best practice in compliance and governance. Partners from different organizational backgrounds bring diverse perspectives for understanding and navigating the complex regulatory environment.
Cultural	Broadening Market Reach	In the culturally diverse markets, one can reach a wider customer base and extend revenue flows. One with different cultural backgrounds can provide insights into local market dynamics, consumer preferences and effective marketing strategies.
	Innovation and Creativity	Cultural diversity fosters creativity and innovation, leading to more effective problem solving. The ability to adapt products and services to diverse cultural needs increases the likelihood of acceptance and success in different markets.
Geographical	Resource and Market Diversification	Regional diversification reduces the impact of natural disasters, economic recessions and political instability. By working with diverse regional partners, natural resources and infrastructure can be accessed, optimizing resource use and reducing costs.
	Operational Flexibility and Resilience	Establishing supply chains through remote partners increases operational resilience and efficiency and enables projects to be managed. Geographical dispersion increases operational scalability, spreads risk and optimizes resource utilization.

Table 4. LNG project location by region and country

Region	No. of project	Country
Asia Pacific	37	Australia (18), Brunei (3), Indonesia (9), Malaysia (6), Papua New Guinea (1)
North America	13	United States (13)
Central & South America	6	Argentina (1), Peru (1), Trinidad and Tobago (4)
Middle East	20	Libya (1), Oman (2), Qatar (13), UAE (2), Yemen (2)
Africa	14	Algeria (4), Angola (1), Cameroon (1), Egypt (2), Equatorial Guinea (1), Nigeria (5)
Western Europe	1	Norway (1)
Russian Federation	6	Russia (6)
Total	97	

Table 5. JV sponsor headquarter location by region and country

Region	No. of sponsor	Country
Asia Pacific	43	Australia (4), Brunei (1), China (5), Indonesia (4), Japan (17), Malaysia (2), Papua New Guinea (3), Singapore (1), South Korea (4), Taiwan (1), Thailand (1)
North America	12	Canada (1), United States (11)
Central & South America	1	Trinidad and Tobago (1)
Middle East	7	Kuwait (1), Libya (1), Oman (1), Qatar (1), UAE (1), Yemen (2)
Africa	6	Algeria (1), Angola (1), Egypt (2), Equatorial Guinea (1), Nigeria(1)
Western Europe	13	Belgium (1), France (1), Germany (1), Italy (1), Netherlands (1), Norway (2), Portugal (1), Spain (2), United Kingdom (3)
Russian Federation	2	Russia (2)
Total	84	

Table 6. Financial institution headquarter location by region and country

Region	No. of FIs	Country
Asia Pacific	60	Australia (5), China (7), Indonesia (4), Japan (15), Malaysia (7), Philippines (1), Singapore (4), South Korea (7), Taiwan (10)
North America	27	Canada (6), United States (21)
Middle East	25	Bahrain (4), Egypt (4), Jordan (1), Kuwait (2), Oman (4), Qatar (3), Saudi Arabia (2), UAE (5)
Western Europe	60	Austria (2), Belgium (3), France (6), Germany (20), Italy (5), Netherlands (2), Norway (2), Spain (5), United Kingdom (12), Sweden (1), Switzerland (2)
Africa	4	Nigeria (4)
Total	176	

Table 7. Variable description for JV sponsors

(I): Independent, (M): Moderating, (C): Control

Variable	Proxy	Value
(I) ID between JV sponsor and host country	World Governance Indicators' mean difference	Continuous value of 0 to 3.78
(I) CD between JV sponsor and host country	Kogut and Singh index's mean absolute difference	Continuous value of 0 to 5.89
(I) GD between JV sponsor and other sponsors	Latitude and longitude differences between capitals	Continuous value of 0 to 2,716
(I) ID between JV sponsor and other sponsors	Sum of World Governance Indicators' mean difference	Continuous value of 0 to 36.16
(I) CD between JV sponsor and other sponsors	Sum of Kogut and Singh index's mean absolute difference	Continuous value of 0 to 60.89
(M) LNG experience in the region	Number of years elapsed since the first year of investment	Integer value of 0 to 49
(M) No. of JV sponsors from the same country	Number of JV sponsors from the same country	Integer value of 0 to 7
(M) Strength of investor protection	World Bank's Index of strength of investor protection	Continuous value of 0 to 8.00
(M) Strength of legal rights	World Bank's Index of strength of legal rights	Integer value of 0 to 12
(C) GD between JV sponsor and host company	Sum of latitude and longitude differences between capitals	Continuous value of 0 to 306
(C) JV sponsor listing	Average of listed = 1 and unlisted = 0	Continuous value of 0 to 1
(C) JV sponsor credit rating	Weighted average of Moody's/S&P/Fitch ratings	Continuous value of 0 to 17.8
(C) Year dummy	Year dummies separated by decade from 1970 to 2021	Dummy
(C) Project country risk	OECD Country Risk Classification	Integer value of 0 to 7
(C) Gas liquefaction capacity (unit: mtpa)	Project's liquefaction capacity (million tons per annum)	Continuous value of 0.5 to 15.6
(C) Local government participation	Value = 1 if local government participates as JV sponsor.	Dummy
(C) JV's participation as offtaker	Value = 1 if JV sponsor participates as offtaker	Dummy

ID: Institutional Distance, CD: Cultural Distance, GD: Geographical Distance

Table 8. Variable description for financial institutions

(I): Independent, (M): Moderating, (C): Control

Variable	Proxy	Value
(I) ID between financial institution & host country	WGIs' mean absolute difference	Continuous value of 0 to 3.76
(I) CD between financial institution & host country	Kogut and Singh index's mean absolute difference	Continuous value of 0 to 8.00
(I) GD between financial institution & lead sponsor	Latitude and longitude differences between capitals	Continuous value of 0 to 301.01
(I) ID between financial institution & lead sponsor	WGIs' mean absolute difference	Continuous value of 0 to 3.62
(I) CD between financial institution & lead sponsor	Kogut and Singh index's mean absolute difference	Continuous value of 0 to 8.58
(M) LNG experience in the region	Number of years elapsed since the first year of investment	Integer value of 0 to 26
(M) No. of JV sponsors from the same country	Number of JV sponsors from the same country	Integer value of 0 to 13
(M) Strength of investor protection	World Bank's Index of strength of investor protection	Continuous value of 0 to 8
(M) Strength of legal rights	World Bank's Index of strength of legal rights	Integer value of 0 to 11
(C) GD between JV sponsor and host company	Latitude and longitude differences between capitals	Continuous value of 0 to 306.19
(C) JV sponsor credit rating	Weighted average of Moody's/S&P/Fitch ratings	Continuous value of 7.30 to 18.15
(C) Offtaker credit rating	Weighted average of Moody's/S&P/Fitch ratings	Continuous value of 0 to 18.00
(C) JV sponsor listing	Average of listed = 1 and unlisted = 0	Continuous value of 0 to 1
(C) Offtaker listing	Average of listed = 1 and unlisted = 0	Continuous value of 0 to 1
(C) Financial institution's own credit rating	Weighted average of Moody's/S&P/Fitch ratings	Continuous value of 6.50 to 21.00
(C) Year dummy	Year dummies separated by decade from 1970 to 2021	Dummy
(C) Host country risk	OECD Country Risk Classification	Integer value of 0 to 7
(C) Government credit enhancement	Value = 1 if government agency provides credit support	Dummy

ID: Institutional Distance, CD: Cultural Distance, GD: Geographical Distance

Table 9. Regression result matrix (1)

Actor	Action	Dependent Variable	Distance	Distance to	Regression Coefficient (Standardized in brackets)		
					Space Direct Effect	Context Interaction Effect	
						Market-system	Bank-system
JV Sponsor	Equity Investment	Shareholding (%)	Institutional	JV partners		+0.080 (.047)	-0.120 (-.066)
				Host country	-.604 (-.062)	-.727 (-.070)	-.791 (-.081)
			Cultural	JV partners		-.049 (-.048)	
				Host country	-.843 (-.123)	-.914 (-.143)	-.645 (-.089)
			Geographical	Other sponsors			
			Financial Institution	Lending	Binary (0/1)	Institutional	Lead JV partner
Host country	-.462 (-.354)	-.422 (-.242)					
Cultural	Lead JV partner	-.224 (-.278)					-.223 (-.265)
	Host country	+0.296 (+.373)				+0.204 (+.262)	+0.293 (+.362)
Geographical	Lead JV partner						-.003 (-.174)

Table 10. Regression result matrix (2)

Actor	Distance	Distance to	Context Interaction Effect			
			Regional Exp.	Same National	Investor Protection	Legal Rights
JV Sponsor	Institutional	JV partners	-			+
		Host country	-			+
	Cultural	JV partners	-			
		Host country	+	+	+	+
	Geographical	JV partners		+	+	+
Financial Institution	Institutional	Lead JV partner	+	-		
		Host country	+	+	-	-
	Cultural	Lead JV partner	+		+	
		Host country	+		+	
	Geographical	Lead JV partner		+		+



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MS0012: Entrepreneurial Ventures in the Face of Regulatory Challenges: A Case Study

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Entrepreneurial Ventures in the Face of Regulatory Challenges: A Case Study.

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1. Introduction:

Café Le Caire (CLC) emerged as a pioneering venture in Singapore's F&B landscape, introducing the concept of shisha cafes to the local market. Founded by Dr. Ameen Talib (AT), CLC faced a myriad of challenges, including regulatory hurdles, and the promotion of a novel product in a heavily regulated industry. This paper provides a detailed narrative of CLC's journey, shedding light on the entrepreneurial characteristics exhibited by AT.

CLC is a owner-managed business in the F&B industry. The case study delves into the entrepreneurial traits displayed by AT, the impact of regulations on business operations, and the strategies employed for promoting a new product in a heavily regulated market.

The case also highlights the challenges of regulations and how in practise many businesses circumvent the controlling regulations. Wei and Talib (2019) discussed how regulations can often drive unethical behaviours in 'Small-Owner-Managed-Enterprises' (SOME).

The paper starts with a background narrative of CLC and the founder. The case then describes the CLC journey to highlight the pertinent points. The case analysis benefits from first hand narration as the author of this paper is also the founder of CLC. Though this is useful, as the founder intentions and inner thoughts are known to the author, it could have inherent biasness.

2. Background of the Founder:

Dr. Ameen Talib's entrepreneurial journey is deeply rooted in his family history and personal experiences. A third-generation Singaporean Arab, AT leveraged his background in academia and finance to embark on ventures that aimed to revive cultural heritage while addressing contemporary societal needs.

AT is a third generation Singaporean Arab. His grandfather, Shiekh Sallim Talib, migrated to Indonesia from Hadramaut, in Yemen, in late 19th century. Shiekh Sallim Talib accumulated his wealth while in Indonesia and migrated to Singapore at the turn of the 20th century. AT's father was born in Singapore in 1920; and subsequently married from Yemen and was in Aden in the 1960s and AT was born in Hadramaut, Yemen. At the age of 10, AT moved to Singapore with his parents and siblings. AT's father had a trading business in Aden in the 1960s. The grandfather had also bequeathed a family settlement that owned a number of properties; including the premises CLC operated from (though CLC was paying commercial market rate rental).

It is worth mentioning that AT grew up financially reasonably comfortable and since moving back to Singapore from Yemen in 1972, his father was not employed nor doing any business by choice. The family income was from the family settlement that the grandfather left behind. When AT was 12 years old, he was selling Christmas cards door to door during the December

school break. As the returns from the sale of Christmas cards were meagre, he would not take public transport to travel from one housing estate to another but would walk or hitch a ride.

The family moved to Cairo, Egypt when AT was 14 years old in 1976. At that time, AT bought about a hundred music cassette tapes from Singapore with money advanced by the father and sold them to music shops in Cairo. He personally went from shop to shop in Cairo selling them. In 1978, his elder brother and a friend were recording music from LPs to cassette tapes and AT was selling it in his school. They even recorded the soundtrack of “ABBA the movie” and stood outside the cinemas (that were showing the movie) and were selling the recorded cassette tapes. (It is worth mentioning that in the 1970s the laws in Egypt on pirated recording was non-existent).

During the 1980s in London, while witnessing the popularity of the Hard Rock Café, AT would always talk to friends and relatives about the opportunity of doing an Arab theme restaurant along the lines of Hard Rock Café and he had the idea of it being a Middle Eastern renaissance café in Europe and back then was calling it Café le Caire which means Cairo café in French. He chose that name as renaissance Egypt was Francophile. However, he never did anything about it.

On returning to Singapore in 1990, AT got very involved with community work. He also felt that the Arab community in Singapore were going through an identity crises and (younger) Singaporeans were starting to forget about the existence of the Arab Community in Singapore. AT felt he needed do something. (see Talib 1996)

3. The Genesis of Café Le Caire:

The inception of CLC stemmed from AT's vision of creating a cultural hub in the heart of Arab Street, Singapore. Despite facing initial scepticism and logistical challenges, AT forged ahead with his entrepreneurial endeavour, enlisting the support of key stakeholders and formulating a strategic approach to operations.

In the first year, business consisted mainly of lunch traffic. AT was adamant not to open for breakfast as his vision was to convert Arab Street into a night spot. He was concerned that by opening for breakfast, his stubbornness and determination to draw the night crowd would diminish. The first year had extremely low night traffic; most customers were AT's personal friends and family.

CLC's early years were marked by perseverance amidst modest sales and operational constraints. AT's dual role as an academic and entrepreneur underscored the challenges of balancing professional commitments while nurturing a embryonic business.

4. Shisha Operations:

The introduction of shisha at CLC presented both opportunities and regulatory hurdles. AT's innovative marketing strategies, including word-of-mouth promotion and community engagement, proved instrumental in circumventing advertising restrictions and cultivating a loyal customer base.

Shisha-smoking is a water-based form of smoking, also known as hookah. It is a very popular leisure activity in the Middle East; with shisha cafes widely spread in most cities in the Middle East. Shisha tobacco is essentially tobacco mixed with molasses and is fruit flavored. As it is

tobacco, shisha is regulated by the tobacco regulations; including the prohibition of any forms of promotion. Shisha was not allowed to be in the menu nor advertised in any fashion.

The shisha cafes in Singapore started in 2001 by CLC of Arab Street. The founder and director of CLC had a vision of reviving the Arabic Quarters of Singapore and advocating an alternative alcohol-free night life. To achieve the vision, CLC viewed shisha as an integral part of the business model, and Arab Street as the only possible location for the premises. As shisha was a tobacco product, it was regulated by the tobacco control unit of the Health Science Authorities (HSA). AT went to meet the director of the tobacco control unit in HSA to enquire about getting a license for shisha and was told it was 'not allowed' in Singapore. There was no Act that explicitly (or implicit) disallowed shisha. After persisting, AT was asked to make written representation to present his case of why shisha should be allowed; which he did. A couple of months after submitting the representation, sometime in September 2001, CLC received a reply from HSA that to serve shisha in the café, the only requirement was the standard tobacco retail license, which CLC had already obtained.

CLC commenced shisha operation as a monopoly being the sole supplier. The resource scarcity meant that the power advantage in the supplier-buyer exchange relation was with the supplier. This, however, was not that simple. There were no barriers to entry for competition, except the uncertainty of market demand. The product was new to the market and there was demand scarcity; particularly as there was a sharp drop in tourist numbers from Middle East due to visa restrictions imposed immediately after Sept 11, 2001. CLC had to create 'local' demand; thus, pricing was set not at high levels. CLC generated demand and Shisha cafes after that mushroomed in the Arab Street area of Singapore. The area, which is a historical conservation area, flourished as an alternative night life.

The majority of Singaporeans back then did not know shisha. One problem AT faced was that the shisha license was only obtained in September 2001 and by then as a result of Sept 11 2001 there were visa requirements imposed on many Arab countries and a sharp drop in Arab visitors was anticipated. AT decided at that time to change the target customers for shisha from Arab visitors to the local market. As shisha is a tobacco product, it could not be advertised nor promoted. He therefore had to think of innovative ways to overcome this issue.

There were four main strategies adopted by AT in entering the Singapore market amidst the hostile advertising environment for tobacco products. They were word-of-mouth (WOM) marketing, utilising key ambassadors, promoting the location as a cultural centre, and ensuring visibility of the smokers and ambience.

AT identified a list of individuals as his key ambassadors in promoting his café and shisha smoking. He identified existing smokers of shisha as his key ambassadors and some of his friends as people to promote the café. When the café first started, he would invite the list of people to his café for a meal to let them get to know more about the café. He would make sure they feel at home as that was the key strategy in making them bring in their network of friends.

Member cards of three different colours was assign to the patrons. Yellow cards were given to any patrons that wanted to be a member; brown was given to the regular patrons while there were limited black cards given. Having a black card was exclusive to only a few customers that were approved by AT as it comes with special indication of their preferences. All three tiers of membership were given the same amount of discount. However, what sets them apart was the "special treatments" given only to black card holders. This exclusive treatment made them feel special and have a sense of belonging to the café. In turn, they reciprocate by bringing in more people to the place.

It was also not about the amount spent by the customers that determines their status of membership. The list of ambassadors would change as AT identifies new ones along the way of operation. The identified primary target audience were age between 20 to 35. As the customer grew older, AT expanded to provide a more sophisticated dining experience by having a formal dining room.

The only promotion was done through word-of-mouth (WOM) at the introductory stage. It was intentional to retain the image of the product and services. As it was a newly introduced product, AT was focused on maintaining public perception of the product. He was concerned about the long-term image creation of the product and café. He wanted to position the product and café as one with character. Through WOM promotion, the type of patrons was more controllable as they were all friends of friends. Yang et al (2012) were of the view that WOM had higher impact for smaller marketing budgets or non-mainstream movies in their study.

The secondary target audience was the local Arabs. In order to reach out to them, AT made the place as a centre for the local Arabs to gather. Promotion to the local Arabs was done at two levels. One was through hiring a local Arab waitress, who was instrumental in bringing young Arabs to the place. In addition, he would invite his relatives to visit the café just to chit-chat. Gradually, the café grew into a spot for local Arabs to gather.

AT would sponsor Arab association dinner events at the café. The aim was to be recognised as a landmark for the Arab communities in Singapore. This would help to make the café a place for families to visit and a place to bring Arab visitors for food when they visit Singapore.

To 'promote' shisha AT himself would sit at the front of his café, smoking the shisha for the entire day. He would also ensure that the speakers are facing the streets to attract the attention of the passer-by at Arab Street. As people walk by and noticed him smoking, he would then explain the mechanism of the apparatus and get them to try.

AT did not want to advertise but expanded his list of ambassadors until CLC became like a club where most customers knew each other. AT would sit with customers and chat all night and there was always one table reserved for AT where certain customers were allowed to sit there as AT would join them. That table was reserved because it gave best view of operations and it was at the entrance. AT became the face of the café greeting customers and chatting with them.

By end of 2002, it started getting crowded at night and most customers became nightly regulars. More similar cafes opened in the area and Arab Street became a popular night spot.

CLC jointly with the Arab Association and Singapore Tourist Board (STB) organized The Arab Heritage Week in June 2004. A large section of Arab Street was closed for traffic and a nightly street party went on for 10 days. That event was very successful in promoting Arab Street. CLC underwrote the costs of the event and after deducting sponsorships and contributions from Arab Street tenants and STB; CLC had to bear around S\$50,000 in costs.

There was a 'boom' in the area after the event. Business in CLC grew and in 2005, CLC expanded, doubling its space to include an air-conditioned dining room, a floor sitting room and a lounge where "live" football matches were screened. AT had a vision of an alternative night life without alcohol and the lounge became like a 'sports bar'. Live telecasts of football matches were major affair of the weekend. CLC had a 'guess the score' competition where who guessed the correct score got a voucher for the next visit.

CLC spent substantial amounts for entertaining customers. Besides the live screening of sports, it had monthly belly-dancing and would organise a party with a "live" music performance on almost every public holiday eve.

Regulatory Challenges:

The regulatory landscape posed significant challenges to CLC's operations, particularly with the implementation of the Prohibition of Smoking in Public Places Act. Ethical dilemmas surrounding compliance, nepotism, and corporate responsibility underscored the complex interplay between entrepreneurship and social accountability.

Prohibition of Smoking in Public Places.

In July 2006 the Prohibition of Smoking in Public Places Act came into effect. The new Act prohibited indoor smoking and allowed only 20% of the outdoor refreshment area (ORA) to be designated as 'smoking area'. AT had formed a business association in 2005 called kampong Gelam Business Association (KGBa) to promote the kampong Gelam area and represent the interest of its stakeholders (Arab Street was a core area of kampong Gelam). KGBa made a written representation to the Ministry of Environment (the relevant ministry overseeing the new Act) to exempt shisha from the prohibition of smoking in public places act. The request was denied.

The shisha cafes in the Arab Street area submitted their area plan drawings identifying the ORA and the 20% smoking area. However, many shisha cafes took the position that 80% of the ORA and the licensed premises indoor was prohibited from allowing patrons to smoke. Therefore the 20% designated smoking area was allowed for smoking as well as any area outside of the ORA and the licensed premises. Some cafes leased premises adjoining their licensed premises and allowed indoor smoking in them as they did not register those premises as part of the café. They were fined continuously for using unlicensed premises. The majority of the cafes put tables outside their registered ORA and allowed smoking as it was outside the 'no smoking' 80% zone. They would also put tables on the road and were being fined by the Land Transport Authority (LTA). Many were also fined for allowing patrons to smoke outside the designated smoking area. As it was merely a fine; no café challenged the charge.

The new regulation placed a constraint on the sale-generating space, effectively limiting (quantity) sales. Prior to the Act the shisha cafes were able to serve shisha indoors and anywhere outdoors; thus 100% of their space was shisha revenue generator. Most of the cafes had a small outdoor area, even with 'creative' extension into the (retail) neighbour's shop fronts. The retail shops in the area mostly closed by 6pm; allowing the shisha cafes to expand their outdoor area by placing tables on these shop-front walkways. Shisha became a popular night activity in the area.

The revoking of licenses.

Sometime in 2010 The National Environment Agency (NEA), which was the enforcing agency for the prohibition of smoking in public places, issued warning letters that any infringement of the prohibition of smoking in public places act would lead to rescinding the smoking corner.

In March 2012 the NEA rescinded the smoking corner of Café le Caire and a few other cafes, for offences under the Act. The rescinding was for 3-year period and took effect immediate before the charge was heard in court.

Café le Caire challenged the charge and pleaded not guilty and appealed. The charge for café le Caire was not shisha related. Unfortunately, a customer smoked a cigarette in a no-smoking area during an inspection by the (NEA) enforcement officers. Café Le Caire felt it was not equitable to be heavily charged for an offence not committed by them. NEA withdrew the charge against Café le Caire and issued them another letter rescinding the smoking corner based

on previous charges that were prior to the warning letter. Café le Caire ceased serving in the smoking corner but continued serving outside the ORA and in an adjoining ‘unlicensed’ premises and continued appealing with NEA. At that point the tobacco licensing authorities in the form of Health Science Authority (HSA) contacted Café Le Caire to withdraw the tobacco retail license. CLC argued that the tobacco retail license does not have a requirement for a smoking corner, as was the case for convenience stores selling cigarettes. HSA did not pursue the cancellation of the license back then in 2012.

In December 2013 HSA issued a letter to Café le Caire cancelling their tobacco retail license. Many other cafes also suffered the same fate, particularly the popular cafes. CLC appealed unsuccessfully; they even requested that they sell cigarettes and pre-pack shisha tobacco without serving shisha but was not successful. The representations and appeals were ongoing when in November 2014 it was announced that sale of shisha will be banned in Singapore. The ban takes place from August 2016; giving the licensed cafes two years to operate without new competition. After that announcement, AT decided to close the café and did so in March 2015.

Despite concerted efforts to navigate regulatory constraints and ethical dilemmas, CLC ultimately succumbed to the regulatory ban on shisha in Singapore. AT's decision to cease operations underscored the inherent tensions between entrepreneurial aspirations and regulatory compliance in a highly regulated industry.

5. Conclusion:

AT's vision was to create an alternative alcohol-free nightlife. CLC was championing that cause and promoting the national exposure and awareness of Arab culture and the existence of an Arab community in Singapore. That included maintaining vibrancy in Kampong Glam heritage district. AT felt that shisha was instrumental in creating the vibrancy. AT also used CLC as a vehicle for his personal charitable and social activities (Holmberg 2014)

The case of Café Le Caire offers valuable insights into the dynamics of entrepreneurship within the context of regulatory challenges and ethical considerations. By examining the interplay between entrepreneurial vision, regulatory constraints, and ethical dilemmas, this study contributes to a nuanced understanding of entrepreneurial ventures in the F&B.

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MS0013: The Effect of Polymathic Headship in Management on Technology-Driven Investment: New Evidence

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The Effect of Polymathic Headship in Management on Technology-Driven Investment: New Evidence

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Extended Abstract

Polymathic Headship in Management (PHM) leverages top management teams' (TMTs) wide-ranging knowledge and enduring pursuit of wisdom across multiple fields to integrate diverse insights, enhancing agility amid evolving business landscapes. Analysis of 636 firm-year observations from the Taiwan Technology Index (2011-2022) reveals an inverted U-shaped relationship between PHM and Technology-driven Investment (Tech-DI) levels. The degree of investment opportunity and tech-savvy directors moderate this relationship. These findings emphasize the shift away from a one-size-fits-all approach toward strategic resource allocation and efficient management practices in technology investments.

Keywords: Polymathic Headship in Management, Technology-Driven Investment, Investment Opportunity, Tech-Savvy Directors

1. Introduction

A proactive approach to technology-driven investment (Tech-DI) is crucial for innovation and substantial returns (Dawid, Keoula, Kopel, & Kort, 2023). In addition, ethical standards in technology initiatives are also imperative to enhance a company's reputation, build stakeholder trust, and increase

profits (Deloitte, 2023). Nevertheless, research on integrating ethical principles with technological advancements remains limited (Kurzahls, Graf-Vlachy & König, 2020). Existing research, based on agency, upper-echelon, and resource-based theories, presents inconclusive findings on the role of top management teams (TMTs) in technology innovation through traditional approaches (Chen, Liu & Tjosvold, 2005; Ma, Zhang, & Yin, 2021). Our study, thus, addresses the research gap by examining strategies for managing Tech-DI to foster innovation based on ethical principles in technology adoption and using sophisticated measurement of the polymathic nature of leadership.

This study is groundbreaking in measuring the polymathic nature of leadership among TMTs using an entropy-based index. Adapting the approach of Benbunan-Fich (2011), this index captures the distribution of diverse knowledge among team members, reflecting a broad spectrum of ideas. The findings reveal an inverted U-shaped relationship between polymathic headship in management (PHM) and Tech-DI, moderated by the presence of tech-savvy directors and varying investment opportunities. Employing complexity theory and upper-echelon theory, this study provides contribution and insights into the impact of leadership diversity on Tech-DI, aligns companies with ethical principles in emerging technology, and emphasizes the critical role of achieving optimal leadership diversity for optimizing technology investments. This advances both theoretical implication and practical guidance.

2. Literature and Framework

2.1 Polymathic headship in management and technology-driven investment

Technology-driven income fuels holistic product development and R&D expansion, supported by management incentives to attract talent (Dawid et al., 2023). Upper echelon theory postulates that diversity in TMTs enhances innovation but can also lead to disagreements (Ma et al., 2021). PHM leverages TMT's diverse skills and learning openness for effective strategy and idea cross-pollination, addressing complexity and evolving challenges with creativity and resilience (Araki, 2015).

Hypothesis 1. There is an inverted U-shaped relationship between Polymathic Headship in Management (PHM) and Technology-Driven Investment (Tech-DI).

2.2 The contextual effects of investment opportunity and tech-savvy directors

This study elaborates on the moderating roles of a firm's investment opportunity and tech-savvy directors, suggesting that the effect varies according to the firm's characteristics.

2.2.1 The moderating role of investment opportunity

Investment opportunities are critical in corporate finance, significantly influencing a firm's market value (Adam & Goyal, 2008). This study investigates investment opportunities' impact on risk perception among managers, owners, investors, and creditors in technology companies, noting inconclusive empirical evidence on this topic.

Hypothesis 2. The investment opportunity moderates the inverted U-shaped relationship between Polymathic Headship in Management (PHM) and Technology-Driven Investment (Tech-DI), with a moderate level of PHM leading to higher Tech-DI in high investment opportunities.

2.2.2 The moderating role of tech-savvy directors

Polymathic headship in management influences decision-making and innovation; lower levels may restrict the scope, while higher levels can lead to conflicts (Chen et al., 2005). A tech-savvy board mitigates these challenges by offering critical technological expertise, strategic insights, and innovative thinking for informed technology investments (Li, Li, Wang, & Thatcher, 2021). They facilitate efficient decision-making and adeptly integrate diverse perspectives.

Hypothesis 3. The high-tech savvy board moderates the inverted U-shaped relationship between Polymathic Headship in Management (PHM) and Technology-Driven Investment (Tech-DI), with the moderation effect being more pronounced at both low and high levels of PHM.

3. Method and results

The study employs fixed-effects panel data regression¹, validated by a Hausman test, to analyze 636 firm-year observations and effectively investigate the proposed hypotheses.

(Table 1 goes about here)

In Table 1, Model 3 examines the inverted U-shaped relationship between Polymathic Headship in Management (PHM) and Technology-Driven Investment (Tech-DI), revealing a significant positive relationship for the linear term and a significant negative coefficient for PHM squared ($\beta = -0.067$, $p < 0.000$), supporting H1. Model 4 introduces interaction terms between PHM and two moderating variables. The interaction with investment opportunity shows a significantly positive effect for the linear term and a significantly negative effect for the squared PHM term ($\beta = -0.408$, $p < 0.010$), supporting Hypothesis 2. Additionally, the moderation by tech-savvy directors demonstrates significant effects for both the linear and squared terms of PHM. Following Cohen and Cohen (1983), Figure 1 shows that modest polymaths maximize Tech-DI initiatives interacted with the high level of investment opportunity. Figure 2 shows that Tech-Savvy Directors moderate the relationship, more pronounced at low and high levels of PHM, supporting Hypothesis 3.

(Figure 1 goes about here)

(Figure 2 goes about here)

4. Discussion

Our findings have important managerial implications that fostering TMTs with multidisciplinary skills is crucial in technology investment. Effective leadership, characterized by a balance of polymaths in management and high investment opportunities, is essential to fully leverage the potential of a holistic venture. Additionally, incorporating tech-savvy directors is vital for successfully navigating complex technological environments while upholding ethical standards in technology.

¹ Due to page limitations, we have not included the descriptive statistics and correlations matrix table; and the variable measures table in this extended abstract

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Figure 1. The Moderating Effect of Investment Opportunity

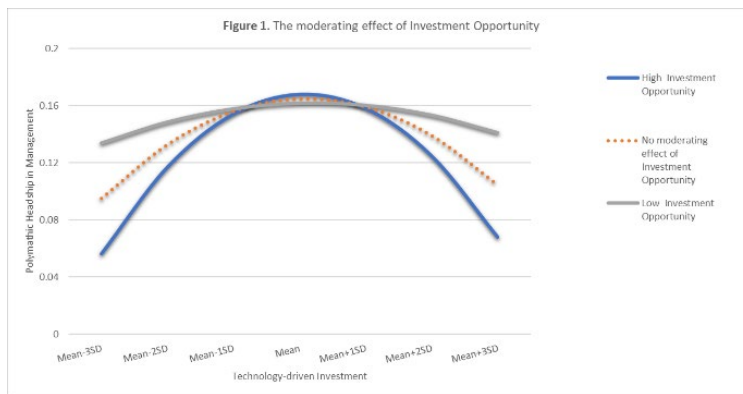


Figure 2. The Moderating Effect of Tech-Savvy Directors

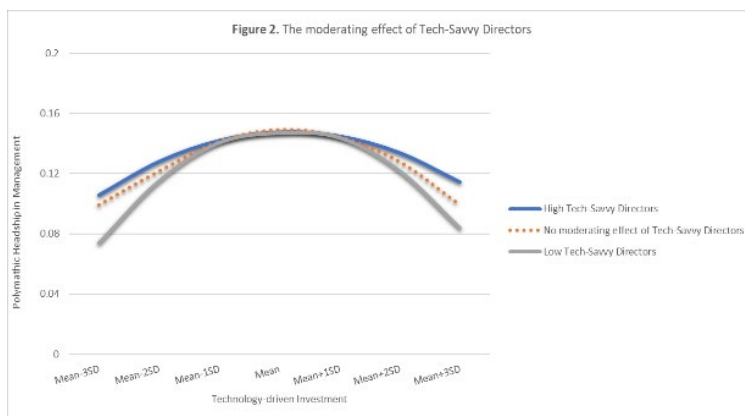


Table 1. Fixed-effects panel regression results

	Model 1		Model 2		Model 3		Model 4	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Constant	0.177	(0.020)	0.167	(0.022)	0.142	(0.022)	0.139	(0.025)
PHM _{i,t}			0.012	(0.880)	0.104***	(0.023)	0.119**	(0.040)
PHM _{i,t} squared (PHMs _{i,t})					-0.067***	(0.016)	-0.074**	(0.028)
Investment Opportunity _{i,t}							-0.218**	(0.075)
Tech-Savvy Board _{i,t}							0.089**	(0.032)
PHM _{i,t} x Investment Opportunity _{i,t}							0.627**	(0.204)
PHMs _{i,t} x Investment Opportunity _{i,t}							-0.408**	(0.136)
PHM _{i,t} x Tech-Savvy Directors _{i,t}							-0.253**	(0.089)
PHMs _{i,t} x Tech-Savvy Directors _{i,t}							0.163**	(0.066)
(a) Number of Employees _{i,t}	0.101***	(0.021)	0.103***	(0.021)	0.105***	(0.020)	0.101***	(0.020)
Debt Ratio _{i,t}	-0.055	(0.039)	-0.054	(0.038)	-0.048	(0.038)	-0.052	(0.039)
ROE _{i,t}	-0.199***	(0.026)	-0.199***	(0.026)	-0.201***	(0.025)	-0.205***	(0.026)
ROA _{i,t}	-0.031**	(0.011)	-0.030**	(0.011)	-0.028**	(0.011)	-0.028*	(0.012)
Operating Revenue Growth _{i,t}	-0.037***	(0.010)	-0.037***	(0.010)	-0.038***	(0.010)	-0.037***	(0.010)
(a) Board Size _{i,t}	-0.006	(0.012)	-0.006	(0.012)	-0.006	(0.012)	-0.006	(0.012)
R ²	0.200		0.202		0.227		0.248	
F	23.98		20.880		21.060		13.380	

Note. Sample size: 636 firm-year observations from 2011 to 2022. †p < 0.1; *p < 0.05; **p < 0.01; ***p <

0.001



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MS0014: Planting Your Seeds in the Right Soil? Technological Competition and Patent Internationalization Within Multinational Enterprises: A Competitive Dynamics Perspective

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**Planting Your Seeds in the Right Soil? Technological Competition and Patent
Internationalization Within Multinational Enterprises: A Competitive Dynamics Perspective**

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Abstract: By linking the competitive dynamic perspective with research on patent internationalization, we explore the impact of technological competitions on MNE's internationalization of patents. Specifically, we distinguish two dimensions of technological competition of MNEs in global market: technological crowding and technological diversity. Moreover, we adopt the Awareness-Motivation-Capability (AMC) framework to investigate the three boundary conditions of our main mechanisms. Using a negative binomial regression with a sample of Chinese listed MNEs in high-tech industries from 2004 to 2023, we find that the technological crowding between a MNE and its home-country rivals in global market positively affects the count of countries that a MNE's patent has been applied, but MNEs' technological diversity has a negative impact on it. And international experience of IPR mitigates the positive effect of technological crowding and the negative effect of technological diversity. The IPR regimes of host countries will weaken the negative effect of technological diversity and MNEs' patent value can enhance the positive effect of technological crowding. This paper enriches the understanding of MNEs' internationalization with a particular patent-level and pays attention to the drivers of internationalization for MNEs' patents. Our findings provide valuable insights into MNEs' internationalization and competitive dynamics perspective literature and can provide guidance for MNEs in patent's internationalization strategy in the technological competition environment.

Keywords: internationalization, international patent, competitive dynamics perspective, MNEs

1. Introduction

In the context of increasing geopolitical frictions, the geographical configuration of IB activities may be reshaped (Cui et al., 2023; Fang et al., 2021; Luo & Witt, 2022). For past decades, the geographical configuration of assets is critical for multinational enterprises (MNEs), it can change the size of MNEs' asset-firm-specific advantages (FSAs) and many MNEs try their best to maximize them (Prud'homme & Tong, 2024). Among many types of asset-FSAs, the proportion of FSAs from intellectual property rights (IPR) assets in MNEs' total asset value is very huge, ranging from 30% to 95% (Wilson, 2012). With a paradigm change towards a society based on knowledge, data and the Internet of Things (IoT) (Chih-Yi & Bou-Wen, 2021), IPR including trademarks, copyrights and patents have become an important strategic asset and emerged a new form of trade barriers and many firms encountered brutal patent war in the international market (Onoz & Giachetti, 2023). To mitigate cross-border patent infringements, break down patent barriers and protect their inventions, considering the geographical configuration of patents prudently to increase MNEs' FSAs is a key strategy for MNEs (Awate & Makhija, 2022; Meyer et al., 2023).

Although it is important for researchers to investigate the geographical configuration of patents and understand how firms gain and sustain competitive advantage in international competition, we only currently have fragmentary understanding of this problem that comes from a handful of studies. Some researchers have pointed out that the internationalizations of patents may be driven by leveraging firm's proprietary knowledge more effectively and avoiding technological inventions being stolen by competitors (Awate & Makhija, 2022; Berry, 2020). Based on traditional internationalization theory, two reasons above are respectively input-oriented and output oriented. For example, Berry (2020) found that because of the threat of preemptive knowledge use by rivals, the more knowledge activity overlap with

home-country and foreign country rivals, the more internationalization of firm's home-country generated innovations(Berry, 2020). While the internationalization of patents as a special geographical configuration of assets for MNEs are usually associated with the technological entry and exploration(Candiani et al., 2022), there is a missing link between some technology exploration factors and the internationalization of patents.

To address this gap, we leverage some concepts from technological exploration literature and choose two major drivers of technology exploration: technological crowding and technological diversity (Barroso et al., 2016; Candiani et al., 2022). Technological crowding refers to the positioning of firms inside a niche and when a firm's technological crowding increases, competitive tension between focal firms and competitors also increases(Baum & Singh, 1994). And technological diversity represents that a firm operates in lots of domains and also relates to competitive actions(Miller, 2006). Grounded in competitive dynamics theory(M. Chen & Miller, 1994), which links the competitive actions between focal firm and rivals to the response of focal firm, our main contention is that facing the technological competitive actions between focal firms and different rivals in global markets, firms will choose offensive and defensive responses, resulting apply international patents to more and less countries.

Based on the core contention, we furthermore examine whether these effects are moderated by international experience of IPR, IPR regime and patent value, three variables that correspond to the awareness-motivation-capabilities framework of competitive dynamics theory (M. Chen et al., 2007; Yao et al., 2024). First, international experience of IPR can help MNEs to accurately *aware* the relevant competitive tensions in the home and global market(Garrido et al., 2023) and assess the risks and opportunities of responses. So MNEs will think more cautious about whether to enter a country. Second, well-functioning IPR regime refers to a strong rule of law and efficient administrative

bureaucracies(Albino-Pimentel et al., 2022) and has adequate legal protection against the risks of misappropriation. Firms have more *motivated* to make more positive response. Third, high-value patents can create technological barriers that prevent competitors from innovating and growing, and protect their own technical advantages(Sterzi, 2013; Higham et al., 2021). And firms have more *capabilities* to apply international patents in more countries.

We conducted a study on Chinese listed MNEs in high-tech industries from 2004 to 2023 to test our predictions. Our results largely support our hypotheses. And our paper gives new insights to the literature in three ways. First, we extend the patent internationalization literature(Albino-Pimentel et al., 2022; Berry, 2020; Karkinsky & Riedel, 2012) in international business by complementing the link between technology exploration and patent internationalization through introducing two concepts, technological crowding and technological diversity, which represent the technological competition between focal firms and rivals. Second, we enrich the competitive dynamics literature(M. Chen & Miller, 1994; Halebian et al., 2012) by framing the internationalization of patents as new IB-related competitive activities and outcomes (Yao et al., 2024). Previous scholars have only focused on some IB-related outcomes such as FDI entry, a repertoire of competitive actions, international litigation actions and survival(Onoz & Giachetti, 2023; Steinberg et al., 2023). Our paper also makes a dialogue with Yao (2024) and pays more attention to country-level factors in awareness-motivation-capability framework, which points out that country-level IPR regime maybe an important motivator(Yao et al., 2024). Finally, our study provides guidance for MNEs to have a comprehensive understanding of patent competition in the international market and make some strategies to enhancing the firm's competitiveness.

2. Research Background

2.1. The determinants of firm internationalization

Scholars have developed several aspects regarding the determinants of firm internationalization: destination location factors, firm characteristics and location-firm dyad characteristics.

Destination location characteristics are critical to the internationalization of MNEs. When conducting the international expansions, MNEs will consider the pure economic, industry agglomeration (Fernhaber et al., 2008; Lamin & Livanis, 2013), political and institutional factors (Arregle et al., 2016; Du & Zhao, 2023) to gain more competitive advantages. The basic consideration of MNEs' internationalization is to obtain greater benefits and less costs so pure economic determinants such as taxation, market size, productivity and wage levels are easy to observe and attract researchers' attention (Karkinsky & Riedel, 2012). At the same time, intra-industry and inter-industry agglomeration are important drivers for MNEs' internationalization because knowledge and technology spillover are geographical proximity (Candiani et al., 2022) and MNEs may prone to make the international expansions in where producers and suppliers gather, which can reduce procurement costs, increase the convenience of information acquisition, and mitigate the risk of appear hold-up contracting problems between upstream and downstream firms. In addition, some researchers investigated the influence of regional institutional complexity (Arregle et al., 2016), government involvement (C. Wang et al., 2012), political tension (Vertinsky et al., 2023) and special economic zone (Frick & Rodríguez-Pose, 2023) on the firm internationalization from institutional theory.

Lots of parent and subsidiary firm characteristics may affect MNEs' internationalization. Extant studies suggested that from the Knowledge-Based View (Grant, 1996) and Resource-Based View (Barney, 2000), MNEs with more natural resources and intangible assets may prone to conduct foreign direct investments and R&D projects to augment or exploit their ownership advantages. For example, they

argued that export orientation and performance depend on the development of capabilities through R&D and technology transfer (Filatotchev et al., 2009). MNEs also seek out complementarities between firm and location-specific resources. In addition, while the firm and destination factors present an obvious effect of MNEs' internationalization, the location-firm dyad characteristics provides another explanation for the drivers of internationalization by proposing that international experience in a particular host location presumably makes MNEs more effective in this place and home-host country culture and institutional distance have a positive impact on the MNEs' liability of foreignness (LOF) (Donnelly et al., 2024; Lee et al., 2023).

In conclusion, the literature has highlighted that the reason why most MNEs make internationalization (i.e., FDI, R&D investment) is to seek market, resources and knowledge, which is essentially to reduce costs and gain more competitive advantages (Galan et al., 2007; Rodgers et al., 2019). Patent as a critical strategical asset, its' internationalization may affect MNEs' competitive advantages and proprietary knowledge protection in current international environment, but our understanding of the drivers of patents' internationalization is very limited. To narrow this gap, our paper uses competitive dynamics theory to examine how technological competitions between MNEs and rivals in global market shape MNEs' response and patent internationalization.

2.2. A competitive dynamics perspective of patent internationalization

Competitive dynamics theory basically concerns interfirm rivalry based on specific competitive actions and reactions, their organizational contexts, and drivers and consequences (M. Chen & Miller, 1994). For example, in Chen & Hambrick (1995)' test of competitive actions of small firms in an industry, they found that smaller firms tend to launch more attacks and are quicker in their execution, a strategy like guerrilla warfare. Additionally, when small firms are attacked, they are less likely to retaliate and

take longer time to carry out their response(Hambrick, 1995). On the contrary, industry leaders may take simple and quick response to solve this crisis(Ferrier et al., 1999). In such cases, the strategies for counterattacking will vary depending on factors such as the type of focal firms and competitors (i.e., firm size, firm market position) and the intensity and scope of the competitor's attack(i.e., attack in home country or global market)(M. Chen et al., 2007). Firms need to find appropriate counter-strategies according to different situations.

In hyperconnected and knowledge and data-based society, where provides some impetuses to enhance the efficiency and accelerates the speed of innovation, resulting in an increase in the number of competitors and intensifying patent-based competition(Scott & Spadavecchia, 2023). Patents are essential resources for firms to maintain their advantages(Cappelli et al., 2023; Chih-Yi & Bou-Wen, 2021). In such contexts, external technological competition can be crucial for firm's international expansion strategy. We argue that MNEs' technological crowding and diversity in global market can be regarded as a form of firm-level multimarket and multibusiness competition(M.-J. Chen & Miller, 2012) because these two factors mean that there are a shared knowledge base and more knowledge contacts between MNEs and their competitors, thus leading to competitive tensions(Candiani et al., 2022). MNEs that observe these competitive behaviors often adjust their resource-allocation patterns to coordinate the spheres of influence(M.-J. Chen & Miller, 2012; Gimeno & Woo, 1999). Therefore, according to different conditions, MNEs may initiate offensive and defensive response with multimarket competitors and apply international patents in more or less countries.

Once MNEs' rivals take competitive actions in global market and convey some competitive signals, MNEs must first be aware of these signals and comprehensively evaluate the risks and opportunities of entering a country. This means that, for MNEs to make a location decision of patents, rivals'

technological competition may not only be sufficiently large and perceived by MNEs, but MNEs also have enough knowledge and experience to recognize the risks of competitive responses (T. Chen et al., 2017; Onoz & Giachetti, 2023). Meanwhile, the motivation of a MNE distributing patents in lots of countries can be regarded as the key factor for MNEs to make a response and prior scholars pointed out that organizational and environmental characteristics such as market dependence and bilateral political relation can be used to present a MNEs' motivation to act (Uhlenbruck et al., 2017). And the capability for MNEs to act usually depends on their intangible assets, which can present a firm's innovation ability and competitive advantage (Pisano & Teece, 2007). In this study, we take three factors international experience of IPR, IPR regime and patent value indicating awareness, motivation and capability respectively as moderators.

3. Hypothesis Development

3.1. Technological competition and patent internationalization

Competitive dynamic theory posits that competition is a dynamic process of firms' actions and reactions and the focal firm's competitive position will be threatened and take the offensive or defensive counterattack behaviors if the competitors undertake some actions (M. Chen & Miller, 1994; T. Chen et al., 2017; Rindova et al., 2004). Following this logic, our baseline hypothesis indicates that a MNE's technological crowding between focal firm and home-country rivals in global market can positively affect the number of countries that a MNE's international patent have been applied and a MNE's technological diversity may negatively influence the number of countries of a MNE's patents distributing.

Technological crowding is defined as the "positioning" of a firm in a technology niche and the degree of specialization of a firm in a technology field densely distributed by their competitors, which is the

extent of overlap between the existing knowledge base of the focal firms and rivals (Barroso et al., 2016; Candiani et al., 2022). However, when a MNE has higher technological crowding with home-country competitors in global market, it may lead to the existence of knowledge spillover in the form of coding and implicit knowledge between focal firm and rivals (Baum & Singh, 1994; Breschi & Malerba, 1997). And home-country rivals may learn from knowledge spillover and enhance their innovation capabilities (Alnuaimi & George, 2016), under this condition, focal firms may face some problems. First, firms become more difficult to keep knowledge proprietary and maintain their competitive advantages, so they need to implement some confidential measures such as data encryption, cybersecurity and collaborating with legal professionals (Pisano & Teece, 2007; Teece, 1986). Moreover, focal firms may face more patent infringements and disputes due to a common knowledge base between focal firms and home-country rivals (Theeke & Lee, 2017). Once the patent litigations occur, focal firms need to hire some professional lawyers to handle those time and money-consuming disputes (C. Lin et al., 2021). These conundrums increase MNE's competitive pressures in global market and force them to engage in offensive responses. Therefore, MNEs distribute international patents in more countries because such actions will have a preemptive knowledge use compared to home-country rivals and set up patent barriers as a deterrent signal to rivals. In sum, when technological crowding increases, the MNE may opt to make patents enter in more countries, this leads to our first hypothesis:

Hypothesis 1a: The higher the technological crowding between a MNE and its home-country rivals in global market, the more countries that a MNE's patent has been applied.

Apart from technological crowding, a MNE's technological diversity is also a key representative of technological competition (Cappelli et al., 2023; Garrido et al., 2023; Stirling, 2007). Diversity measures the extent to which different categories can be differentiated from one another, the more disparate the

categories are, the higher the level of diversity within the system(Candiani et al., 2022). If a MNE has a higher technological diversity in global market, it indicates that it operates in lots of technological niches(Theeke, 2016). And it has led to an increase in potential global competitors and competitive tensions for the MNEs(H.-C. Lin et al., 2015). Compared to the home-country rivals focused above, potential global competitors in the world have several differences: first, it is more in number and prone to cause a higher competitive pressure; second, due to large geographic, institutional, political and culture distance between MNEs and other-country rivals(Du & Zhao, 2023; Y. Li et al., 2020), MNEs are not unfamiliar with rivals' pool of knowledge, talent and products(Berry, 2020). In such context, MNEs may engage in defensive responses and apply patents in less countries because of concerning that a hasty move can lead to a bigger conflict and risk.

Hypothesis 1b: The higher the technological diversity in global market, the less countries that a MNE's patent has been applied.

3.2. Awareness: the moderating effect of international experience of IPR

We expect the positive impact of a MNE's technological crowding on the number of countries that a MNE's patent has been applied to be weakened and the negative impact of a MNE's technological diversity on the number of countries to be strengthened when it has more international experience of IPR. Organizational learning scholars have highlighted that firms usually learn from their own and peer's experience, for example, MNEs' international experience may influence their subsequent international expansion and growth(Baum et al., 2000; Garrido et al., 2023). We define international experience of IPR as the number of which a firm have applied patents in a member of a regionally supranationalized IPR office (i.e., World Intellectual Property Office, European Patent Office). It represents the IPR-related experience accumulated by MNEs in transnational operation and global market competition,

including the understanding of the intellectual property system environment in different countries and regions, and the experience in evaluating international political and legal risks.

Most of competitive dynamic studies exploring the awareness component of AMC framework focused on the factors that influence whether focal firm observes the competitive actions of rivals, like the size and frequency of competitive actions(M. Chen et al., 2007; T. Chen et al., 2017). But these factors do not fully illustrate the awareness component because even though focal firm observes these competitive signals, subsequent interpretation about rivals' competitive actions and its' responses are also vital(Guo et al., 2017; Onoz & Giachetti, 2023). Therefore, we analyze the awareness component from three sequential aspects: (1) aware rival's competitive signals; (2) interpret the rivals' actions; (3) assess the risks and opportunities of focal firm's responses(Baum & Korn, 1996). And we argue that MNEs with rich international experience of IPR can acquire and process market information rapidly, have a high market insight and accurately identify the relevant competitive actions in the home and global market(Garrido et al., 2023). Moreover, it can help MNEs to interpret the signals and aware and assess the threats and opportunities resulting from its' offensive and defensive competitive reactions, thus making MNEs more prudent to respond accordingly. In sum, we propose:

Hypothesis 2a: the positive relationship between a MNE's technological crowding and the number of countries that a MNE's patent has been applied is weakened (i.e., less positive) as a MNE has rich international experience of IPR.

Hypothesis 2b: the negative relationship between a MNE's technological diversity and the number of countries that a MNE's patent has been applied is weakened (i.e., less negative) as a MNE has rich international experience of IPR.

3.3. Motivation: the moderating effect of IPR regime

Whether focal firms apply patents in more or less countries as a result of offensive and defensive responses, such actions involve some risks (i.e., time and financial cost, unfamiliar institutions) and it is hard for MNEs to decide and needs some motivations (M. Chen et al., 2007). So another moderating factor that is well worth considering is the motivation of a MNE's patent to be applied in a foreign country (Albino-Pimentel et al., 2022; Cordero & Miller, 2019; Yao et al., 2023) and many competitive dynamic and international business scholars pointed out that host country environment (i.e., formal and informal institutions) and home-host country relationship (i.e., market dependence and bilateral political relations) can reflect the motivations to enter in a country (Gimeno & Woo, 1996; Uhlenbruck et al., 2017).

Considering that we are exploring the problem of MNEs' patents entering the countries, we choose the host country's IPR regime as our second moderators. IPR regime refers to the level of institutional protection provided to innovators via the legal system (Albino-Pimentel et al., 2022; Bruno et al., 2022; Pisano & Teece, 2007). Therefore, where the IPR regime is strong, it may have well-functioning administrative institutions and objective judiciaries and innovation from domestic and foreign firms is difficult to leak and imitate by rivals (Christopoulou et al., 2021). MNEs do not concern about the risk of appropriation due to strong enough legal protection of host country (Yan et al., 2022). So MNEs have more motivations to apply patents in these countries. Accordingly, we propose:

Hypothesis 3a: the positive relationship between a MNE's technological crowding and the number of countries that a MNE's patent has been applied is strengthened (i.e., more positive) as the host countries' IPR regime are strong.

Hypothesis 3b: the negative relationship between a MNE's technological diversity and the number of

countries that a MNE's patent has been applied is weakened (i.e., less negative) as the host countries' IPR regime are strong.

3.4. Capability: the moderating effect of patent value

Finally, the capability of a MNE's patent to be applied in a foreign country depends on its resource endowments such as intangible assets, slack financial and managerial resources in the host country (Donnelly et al., 2024; Onoz & Giachetti, 2023). Recent researchers argued that patent stock indicates a firm's innovative capabilities, which helps firms to maintain their market positions and hinders the rivals' imitations of their innovations (Berry, 2017). Moreover, slack financial and managerial resources refer to the ability to reallocate unused (i.e., slack) resources to different activities, and they can be redeployed to overcome market entry risks (Donnelly et al., 2024).

Returning to our research context, we focus on the MNEs' average patent value as our third moderators representing the capability component of AMC framework. Patent value refers to the comprehensive embodiment of the writing quality of patent documents, the novelty, creativity and practicability of technical solutions (Han et al., 2024; Higham et al., 2021). If a MNE has lots of high-value patents, it will set up a bigger technological barrier and convey a deterrent signal. Thus, a MNE has more capability to protect its innovations and willing to internationalize its patents (Berry, 2020). In sum, we propose:

Hypothesis 4a: the positive relationship between a MNE's technological crowding and the number of countries that a MNE's patent has been applied is strengthened (i.e., more positive) as a MNE has some high-value patents.

Hypothesis 4b: the negative relationship between a MNE's technological diversity and the number of countries that a MNE's patent has been applied is weakened (i.e., less negative) as a MNE has some

high-value patents.

4. Data, Measures and Method

4.1. Apply patents in foreign countries

MNEs applying patents in foreign countries usually follow three ways: First, firms can directly apply patents in the target countries. If a firm only applies patents in one or a few specific countries, they can submit applications directly to the patent offices of those countries or regions. This method is more direct, but it can be complex and costly if multiple countries are involved. Second, the Patent Cooperation Treaty (PCT) and Paris Convention allow firms to seek patent protection across multiple countries, which simplifies the application process and reduces complexity (Athreye et al., 2020; Berry, 2020). Taking the PCT international patent application process as an example, firms only need to file a single patent through the World Intellectual Property Organization (WIPO) and after the application is submitted, the designated patent office (currently 22, including the China National Intellectual Property Administration) will review the application and issue an International Search Report and Written Opinion. However, the report is for reference only, and the application needs to be transferred to specific international or regional offices for further examination to confirm whether it can be granted patent rights in each country (Duan et al., 2023). Third, Firms can also apply for international patents through the European Patent Office (EPO). Once a patent is approved by the EPO, the applicant can choose to have it validated as a national patent with legal effect in member states of the European Patent Convention.

4.2. Sample

We chose Chinese MNEs as our research object because international patent applications by Chinese MNEs are growing rapidly. The total number of international patent applications in 2016 was

11.41 times in 2008. Additionally, 80% of the international patents are from high-tech MNEs. It indicated that more and more MNEs pay attention to the international intellectual property rights, especially high-tech industries such as computer software, hardware and chips.

Therefore, we collected our sample by starting with all high-tech industries (according to *the measures for the identification of high-tech enterprises in China*) MNEs listed in the China Stock Market and Accounting Research (CSMAR) Database, which is a large Chinese financial market database that provides extensive data services for researchers, analysts, and investors (Du & Zhao, 2023; Yao et al., 2023). Because the methods for firms to apply for international patents was complicated, we used multiple sources to collect the data. Specifically, we employed IncoPat Database to obtain the MNEs' international patents data and PATENTSCOPE (including international patents applied through WIPO) and PATSTAT Database (including international patents applied through EPO) to supplement detailed information such as the specific country and time of an international patent entry, patent citation and patent portfolio. After merging these datasets and excluding some observations with missing information, we constructed a panel data containing 861 high-tech MNEs conducting international patents applying and 4309 observations between 2004 and 2023.

4.3. Measurements

4.3.1 Dependent variable

Because of the IncoPat, PATENTSCOPE and PATSTAT database, we knew all the specific countries that a MNE's patents entered. To investigate the *patent internationalization*, we calculated the number of countries in which patents have been applied in the year t (Berry, 2020). Moreover, we changed the measurement of our dependent variable as a robustness test. And we combined the breadth and depth of patent's internationalization. This can be calculated as entropy or as the converse of a Herfindahl

concentration index(Marshall et al., 2020). The equation for calculating patent internationalization using the Herfindahl approach based on the number of patents for each country, where $number_{ijt}$ is the number of patents for firm i in country j and year t , $Total\ number_{it}$ is the total number of international patents for firm i in year t and n is the total number of countries, is as follows:

$$Patent\ Internationalization_{it} = 1 - \sum_{j=1}^n \left(\frac{number_{ijt}}{Total\ number_{it}} \right)^2$$

4.3.2 Independent variables

Technological crowding (TC) is recorded by aggregating the ratio of common patent citations made by dyad firms and the total number of patent citations made by the focal firm, which indicates the extent to which the technology of focal firm is shared by other firms(Chih-Yi & Bou-Wen, 2021; Stuart & Podolny, 2007). In our paper, dyad firms refer to the focal firm and its home-country rivals, and focal firm's patent includes all the patents in the home and foreign markets. Specifically, we used TC_{ijt} to represent the extent to which firm j has the common patent citations with firm i in year t , so the calculation formula is as follows:

$$TC_{ijt} = \frac{\sum_n TC_{int} TC_{jnt}}{\sum_n TC_{int}} \quad (i \neq j)$$

Where n represents all existing patents in global market and TC_{int} and TC_{jnt} are recorded 1 if firm i and j cite the same patent n in year t and 0 otherwise(Barroso et al., 2016; Candiani et al., 2022). And the denominator is the total number of firm i 's patent citations. To adjust the dyadic-level technological crowding to a comprehensive score for firm i , we sum the dyadic-level crowding scores across firm j . Finally,

$$TC_{it} = \sum_j TC_{ijt} \quad (i \neq j)$$

Technological diversity (TD) indicates the degree to which the niche is composed of disparate technological subclasses. The more technological subclasses a firm has, the more potential competitors

it has in the global market. Following the prior studies(Chih-Yi & Bou-Wen, 2021; Miller, 2006), we measured it as the total number of patents in firm i 's patent portfolio belonging to eight technological classifications according to International Patent Classification(IPC). It divided technology into eight sections, each covering different technical fields (Human Necessities, Transporting, Chemistry, Textiles, Fixed Constructions, Mechanical Engineering, Physics and Electricity). The calculation formula is as follows:

$$TD_{it} = \sqrt{1 - \sum_{j=1}^8 \left(\frac{N_{ijt}}{N_{it}}\right)^2}$$

Where TD_{it} represents the technological diversity of firm i in year t , and N_{ijt} is the number of patents in firm i 's portfolio belonging to section j in year t . N_{it} is the total number of patents in firm i 's portfolio in year t .

4.3.3. Moderators

To measure *international experience of IPR*, we used the number of patents that firm i has been applied in a member of a regionally supranationalized IPR office in the previous five years. The regionally supranationalized IPR office includes European Patent Office (EPO), European Union Intellectual Property Office (EUIPO), World Intellectual Property Organization (WIPO), African Regional Intellectual Property Organization (ARPO) and so on. We obtained the international patents information from official website of each intellectual property office(Hashai & Zahra, 2022).

To measure *IPR regime*, we used the average Patent Enforcement Index (PEI) for the countries that a MNE's patent has been applied. Created by Papageorgiadis (2014), the PEI is a comprehensive indicator designed to measure the extent of “servicing costs,” “property right costs,” and “monitoring costs” at the country level worldwide. The PEI has a value between 0 and 10, where 0 indicates no

protection and 10 indicates complete protection(Papageorgiadis et al., 2014; Papageorgiadis & Sofka, 2020).

To measure *patent value*, we used firm *i*'s average patent value score in year *t*. Patent value is evaluated comprehensively from three aspects in incoPat Database: technical stability, technological advancement and patent protection scope(Higham et al., 2021; Sterzi, 2013). Then, we chose the number of patent citations as a robustness check.

4.3.4. Control variables

In order to exclude other variables that have an impact on the location decisions of patents. following prior literature, at the country-level, we controlled several factors capturing economic, technological and political development index of host country (i.e., *GDP per capita and formal institutions in the host country*)(Albino-Pimentel et al., 2022; Asmussen & Goerzen, 2013; Zhou et al., 2023). Specially, we obtained GDP per capita information from World Development Indicators (WDI)(Du & Zhao, 2023) and we measured the formal institutions index based on the Worldwide Governance Indicators (WGI) from the World Bank and it contains six aspects of formal institutional environment in a country: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption(Donnelly et al., 2024). We also included geographic, culture, institutional and economic distance between home and host country(i.e., *geographical distance*) (Kostova et al., 2020). At the industry level, we used *Herfindahl-Hirschman Index* (HHI) to measure market competition intensity in the home country(Goldberg & Knetter, 1999).

In addition, we included firm-level variables that may influence the patent internationalization. Because larger firms may have more resources, innovative activities, and patents compared to small

firms, so we controlled *firm size*, which was measured as the natural log of total assets for firm *i* in year *t*. Considering that younger firms had a higher probability of engaging in global innovation activities (Coad et al., 2016), we included *firm age*, which was measured as the number of years since the firm establishment. We added *intangible assets ratio*, that was, the proportion of intangible assets to total assets (Teece, 1986). Moreover, because applying patents in foreign markets required a significant amount of time and money, we included *return on assets* (ROA) and *Tobin Q*, to reflect the financial condition of firms. Among them, ROA was calculated as operating income divided by total assets and Tobin Q was measured as market value divided by replacement cost of capital. And we included *R&D intensity*, which represents a company's attempts to develop long-term innovative capabilities (Xu et al., 2019). We used the percentage of R&D expenses on total assets to measure R&D intensity (H. C. Wang et al., 2009). Additionally, we also included some factors related to parent firms and subsidiaries, such as *MNE's international experience and foreign assets*. Finally, at the patent-level, we controlled the *patent life* and *multi-country patent* (Berry, 2020). And when the patent has inventors from more than one country, multi-country patent equals 1; otherwise, it equals 0.

4.4. Estimation Method

Following prior studies (J. Li et al., 2015; Y. Li et al., 2020), we conducted a negative binomial regression model with a count variable as the dependent variable to examine our hypotheses (Hausman & McFadden, 1984). When considering the technological competition on the count of countries that a MNE's patent has been applied, a major concern is that the degree of impact is different in diverse industries. Therefore, to lessen the effects of industry, we included industry dummies. Moreover, we included year dummies to explain any year-specific shocks. Thus, we estimated the negative binomial

regression including industry-fixed and year-fixed effects to control for unobserved heterogeneity. The estimations are shown as follows:

$$y_{it} = \beta_0 + \beta_1 TC_{it} + \beta_2 (TC * International\ experience\ of\ IPR)_{it} + \beta_3 International\ experience\ of\ IPR_{it} + \beta_4 (TC * IPR\ regime)_{it} + \beta_5 IPR\ regime_{it} + \beta_6 (TC * Patent\ value)_{it} + \beta_7 Patent\ value_{it} + \beta_k X_{kit} + \gamma_{industry} + \delta_{year} + \varepsilon_{it} \quad (1)$$

$$y_{it} = \beta_0 + \beta_1 TD_{it} + \beta_2 (TD * International\ experience\ of\ IPR)_{it} + \beta_3 International\ experience\ of\ IPR_{it} + \beta_4 (TD * IPR\ regime)_{it} + \beta_5 IPR\ regime_{it} + \beta_6 (TD * Patent\ value)_{it} + \beta_7 Patent\ value_{it} + \beta_k X_{kit} + \gamma_{industry} + \delta_{year} + \varepsilon_{it} \quad (2)$$

The β_1 is the coefficient of the independent variable, and β_2 , β_4 , β_6 are the coefficients of the interaction terms between two independent variables and three moderators. X_k refers to the control variable, $\gamma_{industry}$ represents the industry dummy, δ_{year} represents year dummy, and ε_{it} is an error term. To account for heteroscedasticity of the errors, as discussed earlier, we clustered standard errors on industry-level.

5. Results

Table 1 presents statistical descriptions and correlation matrix of all the variables. All the correlation values were below 0.8. And we also calculated the variance inflation factors (VIFs) for all the variables in the model. The VIFs were within the range of 1.02 to 2.80, with a mean of 1.42, suggesting no serious multicollinearity problem in our model (Awate & Makhija, 2022; Barnett et al., 1975).

Table 2 presents the negative binomial regression results for H1a, H2a, H3a and H4a. Model 1 is the baseline model, which includes independent and control variables. Model 2 introduces the first moderator – international experience of IPR and the interaction term between technological crowding

and international experience of IPR. And Model 3 and 4 contains the two and third moderators – IPR regime and patent value and the interaction term respectively. Model 5 includes the independent variables, three moderators, all the interaction terms and control variables. Similarly, Table 3 shows the negative binomial regression results for H1b, H2b, H3b and H4b.

Model 1 examines Hypothesis 1a. Hypothesis 1a proposed that the technological crowding between a MNE and its home-country rivals in global market will positively influence the count of countries that a MNE's patent has been applied. Model 1 shows that the coefficient of TC is positive and significant ($\beta = 0.132, p < 0.01$), supporting Hypothesis 1a. Hypothesis 1b predicted that the technological diversity in global market will negatively influence the count of countries that a MNE's patent has been applied. Model 6 shows that the coefficient of technological diversity is negative and significant ($\beta = -0.191, p < 0.01$). Therefore, Hypothesis 1b is also supported. H2a predicted a negative moderating influence of international experience of IPR on the effectiveness of TC. In Model 2, the interaction between TC and international experience of IPR is negative and significant ($\beta = -0.002, p < 0.01$). Thus, Hypothesis 2a is supported. Model 7 shows that the coefficient of the interaction term between technological diversity and international experience of IPR is positive and significant ($\beta = 0.001, p < 0.01$), therefore, Hypothesis 2b is supported.

Hypothesis 3a posits that IPR regime will strengthen the impact of TC on the count of countries that a MNE's patent has been applied. In Model 3, the coefficient of the interaction term is negative and not significant, therefore, Hypothesis 3a is not supported. Similarly, Hypothesis 3b proposes that IPR regime will strengthen the relationship between TD and the count of countries. Model 8 presents that the coefficient of the interaction term between IPR regime and TD is positive and significant ($\beta = 0.368, p < 0.01$), supporting Hypothesis 3b. Hypothesis 4a posits that patent value will strengthen the

positive impact of TC on the count of countries. Consistent with our prediction in Hypothesis 4a, the coefficient of the interaction term between TC and patent value is positive and statistically significant (Model 4; $\beta = 0.044$, $p < 0.05$). And we found that the interaction term between TD and patent value in Model 9 reveals that this effect is negative and not significant, so Hypothesis 4b is not supported. Finally, in Model 5 and Model 10, the regression results are consistent with the above.

[Insert Table 1,2 and 3 about here]

5.1. Robustness Check

To test the robustness of our findings, we conducted several additional analyses, including Heckman two-stage model to address the sample selection problem, different model specifications to test main and moderating effects and different measures of dependent variables. The results are largely consistent with the original one.

[Insert Table 4,5 and 6 about here]

6. Discussion and Conclusion

This paper proposes and verifies the perspective that technological competitions between MNEs and their rivals represent a form of multimarket and multibusiness action, MNEs will allocation their resources, especially, intangible assets, and make the offensive and defensive responses. Eventually, it will influence the patent internationalization within MNEs. We make some empirical analyses of Chinese listed MNEs in high-tech industries from 2004 to 2023, and our results largely consistent with our hypothesis. This paper has several theoretical and managerial implications.

First, our paper improves the understanding of MNEs' patent internationalization. In decades, firm internationalization literature has a central topic about the internationalization of particular types of firms(i.e., family firms, digital firms and so on) at macro-level (Arregle et al., 2021; Feliciano-Cestero

et al., 2023). But our study proposes to explore the internationalization of intellectual property rights, which could be particularly important for MNEs in the knowledge and data-based society (Chih-Yi & Bou-Wen, 2021). Our findings back the viewpoint that technological crowding and technological diversity in global market can serve as a form of multimarket competition between MNEs and rivals and MNEs make different responses according to diverse conditions. Meanwhile, our proposed mechanism is in line with the current international market where has more intense competitions, the prevalence of international conflicts and neo techno-nationalist sentiments (Han et al., 2024; James, 2018; Vertinsky et al., 2023; Witt et al., 2023).

Second, our paper also makes contributions to competitive dynamics theory (M.-J. Chen & Miller, 2012). Over the years, scholars have explored the competitive dynamics from four themes and helped us to fully understand firm's competitive strategy (Yao et al., 2024). Yao (2024) concluded that extant studies drew on competitive dynamics theory to predict some IB-related competitive activities and outcomes, such as FDI entry, export, cooperation and international litigation actions (Onoz & Giachetti, 2023; Steinberg et al., 2023). In our study, we found a new IB-related outcome: patents' internationalization and figure out how technological competitions affect MNEs' patent geographic allocations.

Third, our paper offers additional support for the AMC framework of competitive dynamics and examines the three IPR-related boundary conditions of our core mechanisms (M. Chen et al., 2007; H.-C. Lin et al., 2015). We suggest that a firm's awareness of technological competitions in global market and evaluation of the risks and opportunities about specific responses depend on focal firm's international experience of IPR. Compared to prior studies (Guo et al., 2017; Onoz & Giachetti, 2023), we extend the concept of *awareness* broadly, it not only depends on the size and frequency of the

competitive actions, but also the assessment of risk and opportunity by the focal firm. As far as the *motivation* component is concerned, our study conceptualizes country-level IPR-related institutions, which reflects the focal firm's motivation to apply patents in the foreign country. It is consistent with previous competitive dynamics literatures, which focus on the market environment (M.-J. Chen & Miller, 2012). Moreover, we use patent value to represent a firm's *capability* to respond.

This study also provides significant managerial implications for MNEs, especially those facing the problems of internationalizing their patents, such as high-tech firms. Our findings suggest that in a global market with fierce technological competition, when there is a high level of technological crowding between MNEs and home-country rivals, MNEs can distribute patents in more countries. By doing so, they will preempt the opportunity and convey a deterrent signal to rivals, resulting in better protect their patents. Differently, if MNEs have high technological diversity, firms should exercise caution regarding unfamiliar with large amount of potential global competitors and distribute patents in less countries to avoid more patent disputes. And when host countries have well-functioning IPR regimes and MNEs have high-value patents, these factors can help MNEs to apply patents in more countries and maximize the main effects. However, MNEs with rich international experience of IPR can pay attention to evaluate the risk and opportunity and think more careful about the location decisions. In sum, this paper can provide guidance for MNEs in patent's location strategy in the technological competition environment.

We acknowledge that our study has some limitations. First, the empirical settings are grounded on the Chinese listed MNEs, so there are some concerns about generalizing the results to other markets (i.e., emerging markets and developing markets). Future research is encouraged to investigate the internationalization of patents in global market. Second, while we theorize a competitive dynamic mechanism underlying the actions and reactions between focal firms and their competitors, the use of

secondary data precludes the ability to directly observe the underlying process of sensemaking. Future research can explore more deeply and unpack this process. Finally, in terms of sample selection, we chose A-share listed Chinese high-tech firms, but many firms with great global influence are not listed in China (e.g., Huawei, Vivo, OPPO). We had no way to obtain their financial and other data.

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Table 1 Descriptive statistics and correlations

	Mean	SD	Countries	TC	TD	International experience of IPR	IPR regime	Patent value	Firm age	Firm size	Intangible assets
Countries	3.577	3.865	1								
TC	0.667	0.471	0.134***	1							
TD	0.456	0.220	-0.0150	0.236***	1						
International experience of IPR	85.240	368.517	0.196***	0.096***	0.035**	1					
IPR regime	6.409	0.932	-0.103***	0.053***	-0.044***	-0.030*	1				
Patent value	7.808	1.753	0.188***	0.107***	-0.162***	-0.0200	0.183***	1			
Firm age	12.573	9.401	0.062***	0.247***	0.207***	0.046***	-0.00100	-0.061***	1		
Firm size	16.203	10.108	0.101***	0.278***	0.188***	0.058***	-0.027*	-0.0120	0.841***	1	
Intangible assets	0.029	0.032	0.097***	0.124***	0.031**	-0.00700	-0.0150	0.033**	0.460***	0.558***	1
ROA	0.045	0.083	0.112***	0.081***	0.053***	0.056***	0.000	0.044***	0.250***	0.337***	0.080***
Tobin Q	1.653	1.787	0.128***	0.149***	0.041***	0.083***	0.0180	0.0160	0.442***	0.559***	0.293***
R&D intensity	5.933	21.245	0.044***	0.069***	-0.027*	0.0210	0.00300	-0.00500	0.114***	0.166***	0.153***
International experience	3.003	7.779	0.094***	0.138***	0.103***	0.120***	0.036**	0.057***	0.207***	0.267***	0.162***
Foreign assets	4.751	8.286	0.039**	0.177***	0.038**	0.00100	0.043***	0.094***	0.229***	0.341***	0.284***
HHI	0.098	0.120	-0.00400	0.122***	0.137***	0.032**	-0.00800	-0.076***	0.396***	0.510***	0.224***
Multi-country patents	0.311	3.766	0.174***	0.030**	-0.0100	0.083***	-0.00200	0.026*	0.039**	0.033**	0.036**
Patent life	13.363	27.864	-0.0250	-0.108***	0.0250	-0.089***	-0.070***	0.068***	-0.220***	-0.138***	-0.073***
Geographical distance	9.063	0.262	0.0120	0.048***	0.036**	-0.00600	0.093***	-0.0200	0.0190	-0.0170	-0.045***
GDP	9.119	2.428	0.111***	0.219***	-0.061***	-0.073***	0.266***	0.267***	0.334***	0.395***	0.223***
Formal institutions	1.219	0.274	0.191***	0.00800	-0.085***	-0.0130	0.783***	0.305***	-0.137***	-0.131***	-0.0230

	ROA	Tobin Q	R&D intensity	International experience	Foreign assets	HHI	Multi-country patents	Patent life	Geographical distance	GDP	Formal institutions
ROA	1										
Tobin Q	0.398***	1									
R&D intensity	0.081***	0.154***	1								
International experience	0.059***	0.084***	0.0150	1							
Foreign assets	0.093***	0.146***	0.070***	0.349***	1						
HHI	0.158***	0.272***	0.086***	0.146***	0.147***	1					
Multi-country patents	0.030**	0.078***	0.031**	0.0140	-0.0190	0.000	1				
Patent life	-0.036**	0.116***	-0.069***	-0.076***	-0.00400	0.068***	-0.036**	1			
Geographical distance	-0.00500	0.00500	0.0170	-0.099***	0.047***	0.029*	0.0170	-0.0140	1		
GDP	0.139***	0.239***	0.076***	0.103***	0.145***	0.205***	0.0140	0.088***	0.0220	1	
Formal institutions	-0.00800	-0.038**	-0.0230	0.0140	0.0150	0.076***	0.0190	0.068***	0.028*	0.796***	1

Table 2 The regression results for technological crowding

DV	Model 1	Model 2	Model 3	Model 4	Model 5
H1a: TC	0.132***	0.204***	0.379	-0.221	0.113

H2a: TC*	(0.037)	(0.041)	(0.258)	(0.165)	(0.272)
International experience of IPR		-0.002***			-0.002***
International experience of IPR		(0.001) 0.003***			(0.000) 0.002***
H3a: TC* IPR regime		(0.001)	-0.039		(0.000) -0.035
IPR regime			(0.039) -0.584***		(0.041) -0.625***
H4a: TC* Patent value			(0.059)	0.044**	(0.059) 0.036*
Patent value				(0.021) 0.034*	(0.020) 0.023
Firm age	-0.006**	-0.004	-0.004	-0.006**	-0.001
Firm size	0.149***	0.123***	0.12***	0.147***	0.093***
Intangible assets	0.911*	1.219**	0.483	0.868*	0.705
ROA	0.753***	0.749***	0.757***	0.711***	0.726***
Tobin Q	0.051***	0.040***	0.043***	0.049***	0.032***
R&D intensity	0.002*	0.002*	0.001	0.002*	0.001*
International experience	0.001	0.001	0.001	0.001	0.002
Foreign assets	-0.002	-0.003*	-0.001	-0.003	-0.002
HHI	-0.298**	-0.250*	-0.252**	-0.209	-0.134
Multi-country patents	0.019***	0.016***	0.016***	0.018***	0.014***
Patent life	-0.003***	-0.003***	-0.002**	-0.003***	-0.002**
Geographical distance	1.070***	1.012***	0.739***	1.09***	0.642***
GDP	-1.685***	-1.653***	-0.981***	-1.692***	-0.916***
Formal institutions	4.411***	4.387***	4.636***	4.336***	4.587***
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Constants	-2.396***	-1.541**	-1.788***	-2.662***	-0.788
Observations	3076	2984	3076	3076	2984
Pseudo R ²	0.114	0.121	0.139	0.118	0.151

Notes: (1) *** stands for $p < 0.01$, ** stands for $p < 0.05$, and * stands for $p < 0.1$; (2) TC= Technological crowding; TD= Technological diversity.

Table 3 The regression results for technological diversity

DV	Model 6	Model 7	Model 8	Model 9	Model 10
H1b: TD	-0.191*** (0.070)	-0.225*** (0.074)	-2.468*** (0.544)	-0.011 (0.409)	-2.342*** (0.615)
H2b:TD*International experience of IPR		0.001*** (0.000)			0.001*** (0.000)
International experience of IPR		-0.0001 (0.0002)			-0.0002* (0.0001)
H3b:TD* IPR regime			0.368*** (0.083)		0.452*** (0.086)
IPR regime			-0.804*** (0.066)		-0.907*** (0.065)
H4b: TD* Patent value				-0.016 (0.049)	-0.084 (0.051)
Patent value				0.071** (0.029)	0.091*** (0.030)
Firm age	-0.006** (0.002)	-0.004* (0.002)	-0.004 (0.002)	-0.006** (0.002)	-0.001 (0.002)
Firm size	0.167*** (0.013)	0.139*** (0.014)	0.138*** (0.012)	0.161*** (0.013)	0.104*** (0.013)
Intangible assets	0.699 (0.488)	0.958* (0.499)	0.345 (0.438)	0.654 (0.480)	0.516 (0.442)
ROA	0.737*** (0.139)	0.691*** (0.140)	0.714*** (0.129)	0.704*** (0.135)	0.635*** (0.129)
Tobin Q	0.050*** (0.010)	0.037*** (0.009)	0.044*** (0.008)	0.049*** (0.009)	0.029*** (0.008)
R&D intensity	0.002 (0.001)	0.002* (0.001)	0.002 (0.001)	0.002* (0.001)	0.001 (0.001)
International experience	0.001 (0.002)	0.000 (0.002)	0.001 (0.001)	0.001 (0.002)	0.000 (0.002)
Foreign assets	-0.002 (0.002)	-0.003 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.001 (0.001)
HHI	-0.288** (0.137)	-0.259* (0.138)	-0.244** (0.122)	-0.206 (0.133)	-0.128 (0.116)
Multi-country patents	0.019*** (0.005)	0.017*** (0.005)	0.016*** (0.005)	0.018*** (0.005)	0.014*** (0.005)
Patent life	-0.003*** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)
Geographical distance	1.095*** (0.077)	1.019*** (0.084)	0.770*** (0.077)	1.112*** (0.078)	.641*** (0.081)
GDP	-1.694*** (0.068)	-1.662*** (0.070)	-0.967*** (0.083)	-1.697*** (0.068)	-.863*** (0.080)
Formal institutions	4.429***	4.44***	4.649***	4.349***	4.618***

	(0.162)	(0.163)	(0.152)	(0.162)	(0.144)
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Constants	-2.988***	-1.989***	-1.198*	-3.551***	-0.422
	(0.680)	(0.724)	(0.655)	(0.723)	(0.719)
Observations	3076	2984	3076	3076	2984
Pseudo R ²	0.114	0.118	0.140	0.116	0.152

Notes: (1) *** stands for $p < 0.01$, ** stands for $p < 0.05$, and * stands for $p < 0.1$; (2) TC= Technological crowding; TD= Technological diversity.

Table 4 Robustness check: The regression results for changing the dependent variable

International diversification	Model 11	Model 12	Model 13
H1a:TC	0.134*** (0.035)	-1.482*** (0.446)	
H1b:TD	-0.004 (0.026)		-0.581** (0.238)
H2a:TC* International experience of IPR		0.0002 (0.0004)	
H3a:TC*IPR regime		0.185*** (0.06)	
H4a:TC*Patent value		0.053*** (0.015)	
H2b:TD* International experience of IPR			0.0004*** (0.0001)
H3b:TD* IPR regime			0.126*** (0.036)
H4b:TD* Patent value			-0.028 (0.017)
International experience of IPR		0.0001 (0.0001)	-0.0001 (0.0001)
IPR regime		-0.144*** (0.018)	-0.204*** (0.026)
Patent value		0.015*** (0.004)	0.032*** (0.010)
Firm age	-0.003*** (0.001)	-0.002* (0.001)	-0.002* (0.001)
Firm size	0.055*** (0.005)	0.041*** (0.005)	0.039*** (0.005)
Intangible assets	0.049 (0.180)	-0.072 (0.181)	-0.045 (0.178)
ROA	0.329*** (0.058)	0.326*** (0.060)	0.297*** (0.059)
Tobin Q	0.015*** (0.003)	0.011*** (0.003)	0.010*** (0.003)
R&D intensity	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)

International experience	-0.001 (0.001)	0.0001 (0.001)	-0.0001 (0.001)
Foreign assets	0.001 (0.001)	0.0003 (0.001)	0.0004 (0.001)
HHI	-0.070 (0.044)	-0.023 (0.045)	-0.012 (0.044)
Multi-country patents	0.004*** (0.001)	0.002** (0.001)	0.002** (0.001)
Patent life	-0.001** (0.000)	-0.0004 (0.000)	-0.0003 (0.0002)
Geographical distance	0.269*** (0.029)	0.128*** (0.040)	0.124*** (0.041)
GDP	-0.420*** (0.021)	-0.247*** (0.031)	-0.231*** (0.031)
Formal institutions	1.297*** (0.054)	1.344*** (0.053)	1.331*** (0.053)
Year fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Constants	-1.034*** (0.252)	-0.334 (0.305)	-0.154 (0.329)
Observations	3076	2984	2984
R-squared	0.313	0.362	0.363

Notes: (1) *** stands for $p < 0.01$, ** stands for $p < 0.05$, and * stands for $p < 0.1$; (2) TC= Technological crowding; TD= Technological diversity.

Table 5 Robustness check: using Heckman 2-Stage model

DV	First-Stage Model	Model 14	Model 15	Model 16
H1a:TC		0.145*** (0.045)	-0.234 (0.326)	
H1b:TD		-0.299*** (0.083)		-2.849*** (0.729)
H2a:TC*International experience of IPR			-0.003*** (0.001)	
H3a: TC*IPR regime			0.002 (0.047)	
H4a:TC*Patent value			0.048* (0.026)	
H2b:TD*International experience of IPR				0.001 (0.001)
H3b:TD*IPR regime				0.503*** (0.097)
H4b:TD*Patent value				-0.060 (0.063)
International experience of IPR			0.003*** (0.001)	0.0001 (0.0003)
IPR regime			-0.746***	-1.030***

			(0.062)	(0.064)
Patent value			0.018	0.082**
			(0.024)	(0.036)
Firm age	0.078***	-0.005*	-0.001	-0.002
	(0.012)	(0.003)	(0.003)	(0.003)
Firm size	-0.336***	0.158***	0.081***	0.094***
	(0.063)	(0.018)	(0.016)	(0.016)
Intangible assets	-0.781	0.811	0.677	0.493
	(1.079)	(0.550)	(0.479)	(0.487)
ROA	-1.264***	0.773***	0.695***	0.585***
	(0.286)	(0.161)	(0.152)	(0.148)
Tobin Q	-0.046**	0.058***	0.032***	0.030***
	(0.019)	(0.011)	(0.009)	(0.009)
R&D intensity	-0.0002	0.001*	0.001*	0.001*
	(0.001)	(0.001)	(0.000)	(0.000)
International experience	0.008**	0.002	0.001	-0.0004
	(0.004)	(0.002)	(0.002)	(0.002)
Foreign assets	-0.011	-0.002	-0.001	-0.0005
	(0.010)	(0.002)	(0.002)	(0.001)
HHI	2.801***	-0.213	-0.017	-0.031
	(0.848)	(0.154)	(0.130)	(0.125)
Multi-country patents	0.002	0.019***	0.012**	0.013**
	(0.008)	(0.006)	(0.005)	(0.006)
Patent life	-0.008***	-0.002**	-0.002**	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Geographical distance	0.402***	1.087***	0.589***	0.574***
	(0.155)	(0.091)	(0.092)	(0.090)
GDP	0.899***	-1.801***	-0.949***	-0.888***
	(0.299)	(0.087)	(0.089)	(0.084)
Formal institutions	-2.626***	4.521***	4.812***	4.835***
	(0.869)	(0.200)	(0.171)	(0.170)
IMR		-0.510	-0.624	-0.574
		(0.573)	(0.449)	(0.432)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Constants	3.144***	-1.852**	0.786	1.215
	(1.220)	(0.798)	(0.752)	(0.801)
Observations	7302	2326	2276	2276
Pseudo R ²	0.983	0.110	0.159	0.160

Notes: (1) *** stands for $p < 0.01$, ** stands for $p < 0.05$, and * stands for $p < 0.1$; (2) TC= Technological crowding; TD= Technological diversity.

Table 6 Robustness check: the regression results for Poisson model

DV	Model 17	Model 18	Model 19
H1a:TC	0.209***	-0.047	
	(0.045)	(0.290)	
H1b:TD	-0.283***		-2.323***
	(0.077)		(0.629)
H2a:TC*International experience of IPR		-0.002***	
		(0.000)	
H3a: TC*IPR regime		-0.006	
		(0.046)	

H4a:TC*Patent value		0.034 (0.023)	
H2b:TD*International experience of IPR			0.001*** (0.000)
H3b:TD*IPR regime			0.458*** (0.091)
H4b:TD*Patent value			-0.090* (0.053)
International experience of IPR		0.002*** (0.0004)	-0.0002** (0.0001)
IPR regime		-0.652*** (0.063)	-0.917*** (0.070)
Patent value		0.036* (0.020)	0.106*** (0.031)
Firm age	-0.004 (0.003)	0.001 (0.003)	0.0003 (0.003)
Firm size	0.155*** (0.015)	0.093*** (0.014)	0.107*** (0.014)
Intangible assets	0.985* (0.515)	1.003** (0.465)	0.774 (0.473)
ROA	0.783*** (0.150)	0.761*** (0.142)	0.651*** (0.144)
Tobin Q	0.050*** (0.01)	0.036*** (0.008)	0.033*** (0.008)
R&D intensity	0.001*** (0.000)	0.001*** (0.000)	0.001** (0.000)
International experience	0.002 (0.001)	0.002 (0.001)	-0.0001 (0.001)
Foreign assets	-0.003* (0.002)	-0.003* (0.002)	-0.002 (0.002)
HHI	-0.423*** (0.157)	-0.259* (0.142)	-0.230* (0.136)
Multi-country patents	0.013*** (0.004)	0.009*** (0.003)	0.009*** (0.003)
Patent life	-0.004*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)
Geographical distance	1.109*** (0.117)	0.745*** (0.094)	0.748*** (0.093)
GDP	-1.719*** (0.097)	-1.050*** (0.096)	-0.990*** (0.095)
Formal institutions	4.32*** (0.219)	4.759*** (0.160)	4.761*** (0.158)
Year fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Constants	-2.246*** (0.821)	-0.559 (0.719)	-0.481 (0.762)
Observations	3076	2984	2984
Pseudo R ²	0.227	0.285	0.286

Notes: (1) *** stands for $p < 0.01$, ** stands for $p < 0.05$, and * stands for $p < 0.1$; (2) TC= Technological crowding; TD= Technological diversity.



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MS0015: Sustainable Entrepreneurship Process Model: A Case Based Empirical Attestation

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Extended Abstract

The study is an empirical attestation of the convergent process model of sustainable development process (SEP). Studying a case from an underexplored context, India, it aims to affirm the process model and further develop it to include the idiosyncratic ecosystem. To best fit the research question and phenomenon under study, a single case holistic design was used. Content and thematic analysis based on the interview data of different stakeholders, revealed that there are minor divergences from the existing SEP model.

Keyword: Sustainable Entrepreneurship, Convergent Process Model, Single Case Study Design

1. Introduction

Sustainable entrepreneurship (SE) research has been a topic of fervent contemporary discussions world over due to its relevance in recent times. SE has been defined as “as a unique perspective that combines the creation of environmental, social and economic values, which focuses on ensuring the well-being of future generations” (Anderson, 1998; Terán-Yépez et al., 2020). In its theoretical evolution, sustainable entrepreneurship has been meta-theoretic (Shepherd & Patzelt, 2011), and interdisciplinary (Belz, F. & Binder, 2013; Thompson et al., 2011) as is evidenced by the nature of publications in this area. (Belz & Binder, 2017) developed a six-phase convergent model based on multiple case studies and its concomitant empirical evidences. Considering that scholars in the field agree that the process of sustainable entrepreneurship remains principally under-researched (Lumpkin et al., 2013; Nicolopoulou, 2014), it becomes all the more imperative to delve deeper into this model

in different contexts and ecosystems. The current study is an attempt to do so by exploring an in-depth case of sustainable entrepreneurship from India.

2. Main Body

2.1. Literature

The idea of sustainable entrepreneurship germinated when clear indicators were developed for corporate sustainability (Dyllick & Hockerts, 2002) and it was dynamically remodeled to fit the way sustainable entrepreneurship was defined. (Young & Tilley, 2006) in their research developed the sustainable entrepreneurship model by bringing together the three facets of entrepreneurship i.e. economic, social and environmental and the scope for generating economic equity, inter-generational equity, environmental stability, environmental sustainability, social responsibility and futurity. (Tilley & Young, 2006) further delved to see how this model can be posited for wealth generation in the future and called for further research in the area. Empirical research in country based and sector based research (Rodgers, 2010), competency framework for sustainable entrepreneurship (Ploum et al., 2018), ecosystems conducive for sustainable entrepreneurship (Cohen, 2006; Huang et al., 2023) etc. are extensions that is being actively researched currently. However, calls for extending sustainable entrepreneurship research to developing countries for impact measurement (Terán-Yépez et al., 2020) is an area that is often neglected with very few studies exploring the same. It becomes imperative hence, that the process of sustainable entrepreneurship development in such contexts are garnered, before competence, externalities, and ecosystems are studied. The current study uses the six-phase convergent model (SEP) developed by (Belz & Binder, 2017) to study the evolution of a sustainable enterprise from a context that is seldom examined. Categorically, there are six phases of the SEP, including “recognizing a social or ecological problem, recognizing a social or ecological opportunity, developing a double bottom line solution, developing a triple bottom line solution, funding and forming of a sustainable enterprise and, finally, creating or entering a sustainable market.” The paper looks at how this convergent model has played out in the context of a developing nation (India), by

studying a sustainable enterprise named 7 to 9 Green store which is a for-profit zero waste retail chain pursuing the triple bottom line.

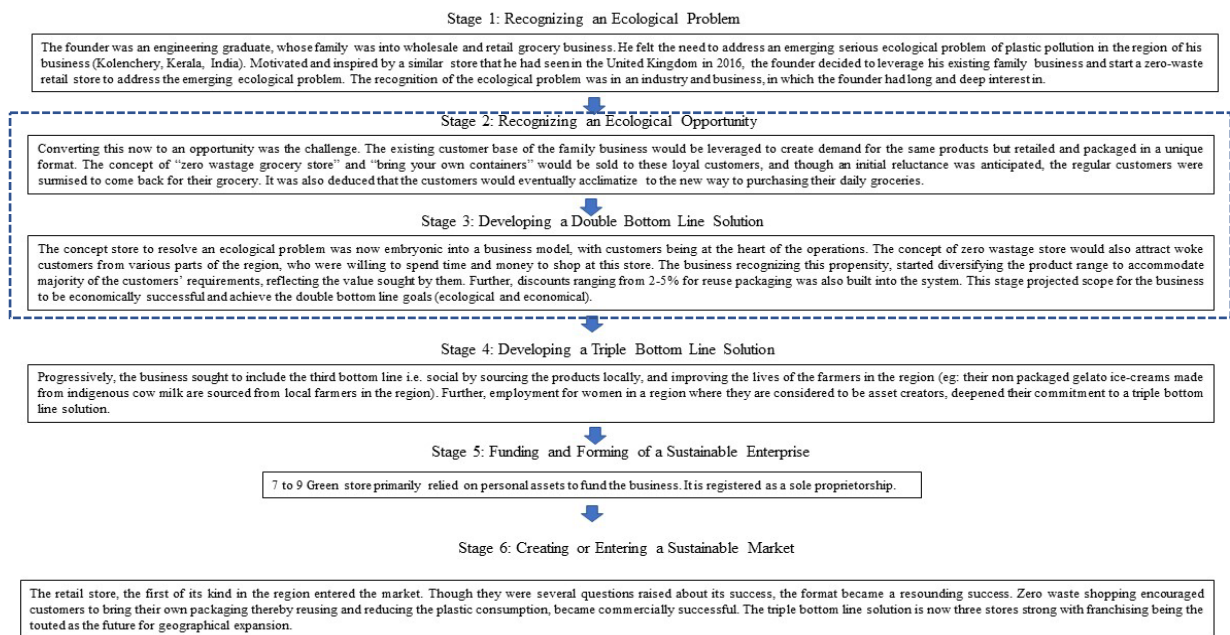
2.2 Methods and Results

To best suit the phenomenon under study, Case study method was deemed to be the most appropriate research approach. Case study method is an empirical enquiry that investigates a contemporary phenomenon within its real life context and helps to answer the “how” of a phenomenon (Yin, 2011).

Case study in this milieu, is used in the theory testing perspective whereby an existing theory (Ketokivi & Choi, 2014) i.e. SEP model is tested in the selected contextual idiosyncrasies with the purpose of confirming, and extending it. Additionally, protracted time periods for the SEP to play out require chronological reporting of actions, events and decisions further emphasising the need for case study approach (Harker, 1996). A single case holistic design was adopted as there is only one unit of analysis. The unit of analysis is a for profit business organisation, where the phenomenon has played out. 7 to 9 Green Store was selected based on this selection criteria. Open ended interviews with the founder, employees and customers were the major sources of evidence. Questions were developed to extract the silhouette of the SEP model. Documentary evidence from published and enterprise owned sources also facilitated description. Content and thematic analysis was done to identify themes and delineate the sustainable entrepreneurship development into the SEP model.

The six steps of the SEP model and how the present study resonates with it is delineated briefly through the following figure:

Figure 2.2: The convergent six step sustainable entrepreneurship model of 7 to 9 Green Store.



3. Conclusion

3.1 Discussions

The in-depth single case study aimed to empirically test the convergent process model of sustainable entrepreneurship and add to the existing literature in the form of empirical attestation in an underexplored context. Although the present study complements the model studied, there are some divergences. Firstly, the model posits the process to be sequential, whereas the current case showed a concurrent nature to some stages. For example, in the present study, recognising ecological opportunity triggered the double bottom line solution and the ecological opportunity identification and

definition self-contained the double bottom line solution. The case in its full description also looked at the exogenous environment and its possible impact on the process of sustainable entrepreneurship.

It is also one step in the direction of explaining how intergenerational and intragenerational equity is created when enterprises focus on the three bottom lines with equal vigour. Selective recall and post rationalization in reflective accounts of central figures could be a limitation of this study, which is partially surmounted by triangulation of evidences from various sources.

The case throws light on the development and establishment of a sustainable enterprise which has the potential to overcome unfavourable institutional barriers and market imperfections encompassing it.

The case and the context are also a wake-up call to the institutional support systems at the regional, federal and national levels like government, incubation cells and private investors to enhance their adaptiveness to support sustainable entrepreneurship. This case is further testament to the ability of sustainability driven entrepreneurship to be wealth generators of the future.

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MS0016: Influence of Budgetary Control on the Growth of MSME'S in Southern Manila District of NCR, Philippines

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Influence of Budgetary Control on the Growth of MSME'S in Southern Manila District of NCR, Philippines

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Abstract

The study investigates the relationship between budgetary control on the Growth of Micro, Small and Medium Enterprises (MSMEs) in Southern Manila District of National Capital Region. The goal of the study is to provide a comprehensive understanding of the transformative influence of budgetary control on the growth of MSME's. The study shows that most respondents agree that good budgetary control can lead a good business operations growth and efficiency. This study enhances the current understanding particularly in the budgeting and growth development of Micro, Small and Medium Enterprises (MSMEs). This will give local businesses tactical advantages in management techniques in terms of proper budgeting.

Keyword: *Budgetary Control, Micro Small and Medium Enterprises (MSME's)*

Introduction

Micro, Small and Medium sized Enterprises have been around for a long time among business institutions. MSME's are considered the oldest source of credit where they play an alternative role to banking institutions as it offers services like micro-lending. Over the years, MSME's have evolved into a more diversified place that offers both product and services. Small and Medium sized Enterprises deliver immediate contributions to the economy and can create more jobs that can boost the nation's productivity. However, due to the rapid growth and expansions of many Small and Medium sized Enterprises in the Philippines, huge competition is present among the industry. The competition as well as the high percentage of unredeemed Small and Medium sized Enterprises items are affecting the cash inflow balance. The study investigates the relationship between budgetary control on the Growth of Micro, Small and Medium Enterprises (MSMEs) in Southern Manila District of National Capital Region. The goal of the study is to provide a comprehensive understanding of the transformative influence of budgetary control on the growth of MSME's.

Problem

A good budgeting system helps organizations plan and oversee operations including revenue, expenses, and financing sources, as well as assists management in making appropriate budgeting decisions.

Although budgetary control has a significant impact on financial performance in financial institutions such as Micro, Small and Medium sized Enterprises, they still face several issues, including a lack of participation in the budgetary process, a lack of effort required for budget monitoring, and poor planning quality. Furthermore, there is little data on the relationship between budgetary controls and firm growth. It is still in question as to how the determinants of budgetary control (planning, monitoring, and control as well as budgetary participation) influence the firm's growth.

The study analyzed how budgetary control influences the growth of MSME'S in Southern Manila District of NCR. The researchers also answer the following specific questions:

1. What is the profile of the business in terms of:
 - 1.1. Type of Business Structure
 - 1.2. Annual Gross Income
 - 1.3. Initial Capital Amount
 - 1.4. Total Number of Employees
2. What are the necessary measures MSME'S take for budgetary control? In terms of:
 - 2.1. Planning
 - 2.2. Monitoring and Control
 - 2.3. Participative Budgeting

3. How does budgetary control influence the growth of MSME'S in Southern Manila Region of NCR? In terms of:
 - 3.1. Profit
 - 3.2. Expansion of Operations
4. Are the measurement of budgetary control influences the and firm growth?
5. Based on the findings of the study, what strategy framework can be proposed for the budgetary control on the growth of MSME's in Metro Manila?

Hypothesis

To examine the impact of budgetary control on the growth of MSME's, the following hypotheses were considered.

H01: The measurements of budgetary control do not significantly influence the growth of M SMEs in Southern Manila District of NCR.

Significance of the Study

This study was driven by the necessity to conduct an in-depth analysis of the budgetary control methods on MSME's to assess their performance. The lack of accessible information may result in limited growth potential for these businesses, eventually causing them to lag in the market without even realizing it. This research aims to provide information and knowledge on the impact of budgetary control on the growth of MSME's. The researcher believe that the result and outcome of this paper will benefit the following:

National Economic Development Authority (NEDA). This study would help the NEDA to ensure a comprehensive representation of the Micro, Small and Medium Enterprise and its contribution on the Macro Economy of the Philippines.

Legislative (Lower and Upper Congress). This study would help the legislative of the Philippines in formulating a regulatory framework policy that will help the expansion of growth of Micro, Small and Medium Enterprises.

Department of Trade and Industry (DTI). This study would help the government to understand how lowering taxes and having a good economy of scale can contribute to the potential earnings for the growth of MSME's.

Business or Company Owners. This study will help owners decide if they will promote the strategies of budgetary control.

Theoretical Framework

This research was similar on the Link Between Budgetary Control and Financial Performance Model by Ng'Wasa (2017) Model. This study model focused on the impact of the determinants of budgetary control with an emphasis on budgetary planning, monitoring, and control, as well as budget participation on a firm's financial performance. The idea was linked, as shown in Figure 4, demonstrating how budgetary planning, monitoring, and participation had a direct relationship with financial performance. Also, it showed how general budgetary control affects a company's financial performance. Budgetary planning affects financial performance by ensuring all the goals are managed through a spending plan. Additionally, budgetary monitoring affects financial performance by utilizing budgetary plans as a control tool to monitor all its financial activities over a given period. Lastly, budgetary participation has a direct relationship with financial performance since budgeting raises employees' awareness of the budgeting process.

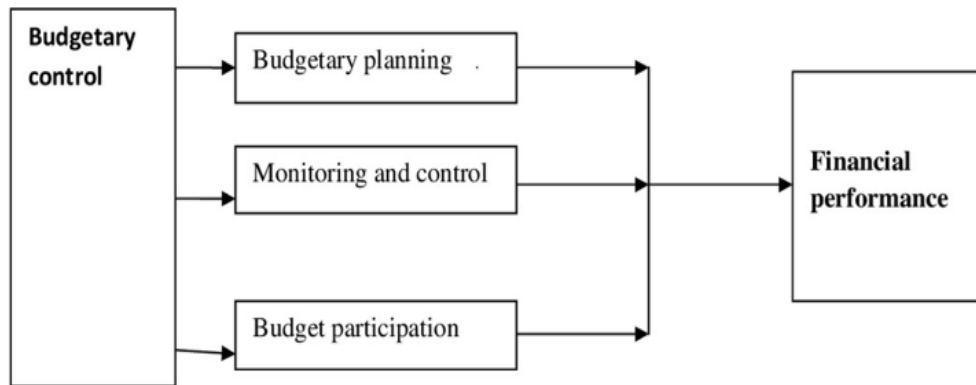


Figure 1 The Link Between Budgetary Control and Financial Performance in Financial Institutions. A Case of National Microfinance Bank (NMB) Zonal Office (Central Zone) Dodoma (Ng'wasa, 2017).

Research Design

The methodology utilized in this study is a descriptive research design, which aims to describe the current situation or phenomenon. This design is appropriate for the researcher's study since it aims to gather data on budgetary control that influences the MSME's Growth. As stated in an article by Kumar and Sankarapandian (2018), the descriptive design is used to get a clear understanding of a particular topic or subject, making it suitable for this study since the researcher needs to examine the current impact of budgetary control on the performance and growth of MSME's. The study utilized a quantitative method. This research design is well-suited for the study, as it enables a thorough examination of the research problem. To collect quantitative data, a survey questionnaire will be administered to MSME owners in the Southern Part of National Capital Region via both physical survey and online via group page on Facebook accounts.

Findings

Table 1. Frequency, Percentage Distribution, and Ranking of the Type of Business by Respondents

	Frequency	Percentage	Rank
Sole Proprietorship	257	72.6%	1
Partnership	86	24.3%	2
Corporation	11	3.1%	3
TOTAL	354	100%	

Table 1 outlines the respondents using the type of business by the respondents in Southern Manila Part of NCR. Among the 354 respondents who participated in the data-gathering process, most of the respondents owned sole proprietorship (n=257 or 72.6%) followed by partnership (n=86 or 24.3%), lastly was the corporation (n=11 or 3.1%).

Table 2. Frequency, Percentage Distribution, and Ranking of the Initial Capital Amount of MSME's

	Frequency	Percentage	Rank
Micro – Less and Equal to Php. 3 million	165	46.6%	1
Small – Php. 3,000,001 to Php. 15,000,000	166	46.9%	2
Medium – Php. 15,000,001 to Php. 100,000,000	23	6.5%	3
TOTAL	354	100%	

Table 2 outlines the respondents using the Initial Capital Amount of MSME's in Southern Manila Part of NCR. Among the 354 business establishments who participated in the data-gathering process, most of the respondents have an initial capital amount of Php. 3,000,001 to Php. 15,000,000 (n=166 or 46.9%). Second was Micro Enterprises with an initial capital amount of Less and Equal to Php. 3 million (n=165 or 46.6%).

Table 3. Frequency, Percentage Distribution, and Ranking of the Number of Workers in their Business Operations

	Frequency	Percentage	Rank
1 Person	118	33.3%	2
2-10 Persons	136	38.4%	1
More than 10 Persons	100	28.2%	3
TOTAL	354	100%	

Table 3 outlines the respondent's number of workforce in their business operations of MSME's in Southern Manila District of NCR. Among the 354 business establishments who participated in the data-gathering process, most of the respondents have 2-10 employees (n=136 or 38.4%) as their total number of their manpower.

Table 4. Frequency, Percentage Distribution, and Ranking of the Type of Budgeting Methods of MSME's

	Frequency	Percentage	Rank
Zero-Based Budgeting	78	22%	2
Activity Based Budgeting	172	48.6%	1
Flexible Budgeting	78	22%	2
Value Proposition Budgeting	21	5.9%	3
Incremental Budgeting	5	1.4%	4
TOTAL	354	100%	

Table 4 outlines the respondents using the type of budgeting methods of MSME's in Southern Manila Part of NCR. Among the 354 business establishments who participated in the data-gathering process, most of the respondents used the activity-based budgeting method (n=172 or 48.6%).

Table 5. The Necessary Measure of Budgetary Control of MSME's

Indicators	Mean	VI	STDV.	Rank
Planning	3.23	Agree	.701	1
Monitoring and Control	2.52	Agree	.722	3
Participative Budgeting	2.78	Agree	.998	2

Weighted Mean shows the average score for each statement, calculated by giving different weights to different responses according to their importance or scale position. SD measures the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean, while a high standard deviation indicates that the values are spread out over a wider range. Most of the respondents said that they agreed that Planning, Monitoring and Control, Participative Budgeting are the necessary measurements of Budgetary Control of MSME's in the Southern Region Part of National Capital Region. This entails that most of the respondents are committed to ensuring that the company's performance is within the goal, budget, and scope. Also, the organization makes sure that they have budget policies to monitor business expenditures.

Table 6. Budgetary control influence on the growth of MSME'S in Southern Manila Region of NCR

Indicators	Mean	VI	STDV.	Rank
Profit	2.72	Agree	.763	1
Expansion of Operations	2.47	Disagree	.931	2

A low standard deviation indicates that the values tend to be close to the mean, while a high standard deviation indicates that the values are spread out over a wider range. Most of the respondents said that Profit influences the growth of MSME'S in Southern Manila Region of NCR while Expansion of Operations will not be affected nor influenced by budgetary control.

Table 7. Spearman Rank Correlation of Budgetary Control on the Growth of MSME's in Southern Part of Metro Manila.

			BUDGETARY CONTROL	FIRM GROWTH
Spearman's rho	BUDGETARY CONTROL	Correlation Coefficient	1.000	.383**
		Sig. (2-tailed)		0.000
		N	354	354
	FIRM GROWTH	Correlation Coefficient	.383**	1.000
		Sig. (2-tailed)	0.000	
		N	354	354
**. Correlation is significant at the 0.01 level (2-tailed).				

Note: If p value is less than or equal to the level of significance which is 0.05 reject the null hypothesis otherwise failed to reject H_0 . Correlation coefficient values: $\pm 0.76 - \pm 0.99$ Very Strong; $\pm 0.51 - \pm 0.75$ Strong; $\pm 0.26 - \pm 0.50$ Moderate; $\pm 0.11 - \pm 0.25$ Weak; $\pm 0.01 - \pm 0.10$ Very Weak

Table 7 illustrated the influence of Budgetary Control on the Growth MSME's in Southern Part of Metro Manila. Spearman Rho Correlation was computed to assess the influence of Budgetary Control on the Growth MSME's in Southern Part of Metro Manila with a p-value of 0.000 which is lesser to the p-value of 5 percent. Thus, it will conclude that Budgetary Control influences the Growth of MSME's in Southern Part of Metro Manila. It also showed that budgeting assists businesses in allocating finances and planning operations.

Conclusion

The empirical findings revealed that there was an influence between budgetary control on the growth of MSME's. Therefore, on their financial performance and profitability, MSMEs should consider additional variables like competitive positioning, management practices, and operational efficiencies for their budgetary practices. Lastly, as the MSMEs viewed their businesses differently based on their size and industry, their budgeting approach practices as well as their allocation of funds per business type category likewise vary from one another, hence the result of the study.

Recommendations

After thorough analysis and interpretations of the survey results, the researchers propose the following recommendations:

The researchers recommend **National Economic Development Authority (NEDA)** includes a regulatory annual report of data gathering by having the total population of MSME's yearly to determine neither the increase nor the decrease of the population of different categories of MSME's.

This will provide an idea to the National Government of the potential factors that affect their budgetary system that in a latter part will affect their potential growth as well.

The researchers recommend that the **Legislative Body of the Philippines** formulate a regulatory framework and policy to recognize and ensures the rights of MSME's alongside the lessen their governmental fees, permits and even a percent of their taxes to help them on alleviating on their budget.

Through the power of the legislative body, the researchers recommend the **Department of Trade and Industry** establish a sector or sub-agency mainly watching the problems usually encountered by MSME's and identifying the possible threats on their business operations.

Lastly, the researchers recommend the **Business / Company Owners** to conduct training and seminars about proper budgetary allocation and financial stability seminars that will uplift their skills on handling their businesses.

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MS0017: The Alleviating Role of University Engagement in Negative Spillover Effect of Green-tech FDI

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The alleviating role of university engagement in negative spillover effect of green-tech FDI

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Abstract

From the network perspective, we propose that universities can coordinate the intense market competition between foreign and domestic firms by accelerating green technology diffusion within the local innovation ecosystem. Therefore, they can indirectly alleviate the negative spillover effects of green-tech FDI on regional green innovation in emerging markets. With a sample of 4,885 city-year observations in China from 2003 to 2019, our findings support the assumptions and show that the breadth and depth of local university engagement can weaken the negative effect of green-tech FDI on regional green innovation.

Keyword: University engagement, FDI spillover effects; regional green innovation

1. Introduction

To address environmental challenges and achieve environmental sustainability, an increasing number of emerging economies are looking for foreign direct investment (FDI) that will contribute to environmental improvement rather than merely economic development (Bu & Wagner, 2016). Green-tech FDI is a particular type of FDI that “occur in industries whose knowledge base rely significantly on the invention of new environmental technologies (Castellani et al., 2022, p.104405)”. The existing evidence from developed economies has shown that green-tech FDI has significant positive impacts on regions’ specialization in green technology because domestic firms could imitate advanced technology from multinational enterprises (MNEs), absorb high-quality employees who are trained by MNEs, learn advanced management practices by becoming the suppliers, customers or distributors of MNEs, and strive to improve their technological capacity to deal with the competitions from MNEs (Fang et al., 2023). However, unlike the context of developed economies that firms possess relatively higher level of technological capacities, most firms from emerging markets are not adequately resource abundant and technologically advanced to solve grand challenges, such as climate change and environmental pollution (Duanmu, Bu et al. 2018). Prior studies suggest that FDI may also have negative spillover effects, especially in emerging markets, because foreign firms with superior technologies can capture market share and crowd out domestic firms (Ascani & Gagliardi, 2020; García et al., 2013). As green-tech FDI is a type of technology-intensive FDI, it remains underexplored how to alleviate the negative spillover effects of green-tech FDI.

2. Theoretical background and hypothesis development

2.1 Network perspective and the role of university in green-tech FDI spillovers

Network perspective suggests that relationships in network can perform as channels to diffuse and transfer technologies and knowledge, and the effectiveness of knowledge discussion and transfer depends on the relational properties, nodal properties and knowledge properties (Phelps et al., 2012). Nodal properties consider the individual actors that constitute networks as nodes (Laage-Hellman et al., 2018). Universities, as a key institutional actor in local ecosystem networks, often have interactions with local industries and businesses. To better examine the role of universities as a knowledge coordinator between foreign and domestic firms, unlike the majority of prior studies on the role of universities in firm innovation that treat universities homogeneously, we propose that the breadth and depth of university engagement in the coordination between foreign firms and domestic firms may affect their effectiveness in alleviating negative spillover effects on regional green innovation. Performing as bridges between foreign and domestic firms, it requires universities in local ecosystem to possess access to both foreign and domestic firms. Therefore, the breadth of university engagement captures the degree how likely universities are able to get access to foreign and domestic firms respectively. When universities in local ecosystem have greater access to foreign firms with green technological advantages, it provides universities to opportunity to interact with a greater number of green-tech FDIs and get green knowledge and information. Meanwhile, when universities in local ecosystem have greater access to domestic firms, they are able to facilitate dissemination and application of green technology to domestic firms. Therefore,

H1: The breadth of university engagement can significantly alleviate the negative spillover effect of green-tech FDI on regional green innovation in emerging markets, whereby:

H1a: Accessibility of universities to foreign firms weakens the negative relationship between green-tech FDI inflow and regional green innovation.

H1b: Accessibility of universities to domestic firms weakens the negative relationship between green-tech FDI inflow and regional green innovation.

The depth of university engagement also influences the effectiveness of the university's coordination role. Within the network, the depth of university engagement refers to the degree how

deep universities can engage with foreign and domestic firms, implying the capabilities of universities to repeatedly develop interactions and facilitate more complex and high-quality resource exchanges among actors than breadth. Therefore,

H2: The depth of university engagement will alleviate the negative relationship between green-tech FDI inflow and regional green innovation in emerging markets, whereby: the depth of university engagement weakens the negative effect of green-tech FDI on regional green innovation.

3. Method

3.1 Research context and sample

We chose China as the empirical setting for our research for the following reasons. First, the Chinese market makes many efforts in green innovation and emphasizes the role of university engagement. Second, China has the largest amount of inward FDI from global markets (Du and Zhao, 2023), and there is significant within-country variation in China. We collected our data from multiple sources, such as We fDi Markets database, CNRDS database, Statistics of science and technology in colleges and universities and China City Statistics Yearbook and the China Market Index Database. After excluding missing data, our final sample is composed of 4885 city-year observations from 299 Chinese cities between 2003 and 2019.

3.2 Variables

Dependent variable (*Green patent applications*) was measured as the number of green patent applications. Independent variable was operated as the total amount of capital investment of green-tech FDI projects that enter each Chinese cities in a given year. Green tech FDI projects were identified based on the method used by Castellani et al. (2022). We chose two proxies to represent the breadth of university engagement as the breadth represent the degree that universities are able to connect foreign and domestic firms in the same regional ecosystem respectively. *Accessibility to foreign firms* were proxied by the number of local universities with reputational international rankings. *Accessibility to domestic firms* was measured as the number of contracts for the transfer of scientific and technological achievements signed between universities and domestic firms per year in each province as an indicator. The depth of university engagement was proxied as the amount of the research funding allocated to universities by the province-level government (*research resources*).

We also control several factors to rule out potential confounding effect. The control variables include GDP, population growth, the development of the secondary industry, local government expenditure on science (log transformed), the number of international Internet users, and market openness.

4. Results

As our dependent variable is the countable data, we adopted the fixed effects negative binomial regression. Table 1 shows the regression results. The coefficient of green-tech FDI is negative and significant ($\beta = -0.073$; $p = 0.000$), suggesting that inward *green-tech FDI* has significant negative spillover on regional green innovation. To test the hypothesis, we include the interaction term—*Accessibility to foreign firms* and *green-tech FDI*. A significant positive moderating effect was observed in Model 3 ($\beta = 0.022$; $p = 0.000$), which supports Hypothesis 1a. The interaction term *Accessibility to domestic firms* in Model 4 is positive and significant ($\beta = 0.022$; $p = 0.000$), supporting H1b. In Model 5, the coefficient of the interaction term *Research resources* is positive and significant ($\beta = 0.029$; $p = 0.000$). H2 is supported.

To test the robustness of our results, we conduct additional analyses. First, we used alternative dependent variable, the number of green patent awards. Second, we use the number of jobs created by green-tech FDI in China as alternative measure of independent variable. We also applied the alternative estimation method--the two-stage least squares (2SLS) model with two instrumental variables to rule out potential reverse causality issue.

5. Conclusion

This study explores the research questions whether and how universities embedded in local ecosystem networks can help alleviate potential negative spillover effects on regional green innovation. It makes several theoretical contributions. First, this study enriches the literature of universities in innovation by conceptualizing the role of universities as coordinators with network perspective. Second, it extends the research on FDI spillovers by exploring the boundary conditions with focus on other actors within local ecosystem networks. Finally, this study also contributes to the environmental sustainability of emerging economies by highlighting the important role of joint partnerships in the public and private sectors (Arslan et al., 2024).

The findings also shed lights on policy makers and managers. For example, both firms and governments need to pay greater attention on the role of knowledge diffusion of universities. Although our study sheds new light on the role of university engagement on the negative spillover effect of green-tech FDI on regional green innovation in emerging markets, our study still has some limitations. Future studies may consider to adopt more direct proxies for breadth and depth of university engagement and test the findings in other contexts.

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Table 1 Negative binomial regression results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variables	Green patent applications	Green patent applications	Green patent applications	Green patent applications	Green patent applications	Green patent applications
GDP	0.203*** (0.035)	0.286*** (0.035)	0.284*** (0.035)	0.319*** (0.035)	0.251*** (0.036)	0.258*** (0.036)
Pop	0.010*** (0.002)	0.004* (0.002)	0.003 (0.002)	0.003 (0.002)	-0.000 (0.002)	-0.001 (0.002)

Secondary industry	-0.004*** (0.001)	-0.003** (0.001)	-0.002** (0.001)	-0.002* (0.001)	-0.000 (0.001)	0.000 (0.001)
Sci	0.250*** (0.014)	0.226*** (0.014)	0.218*** (0.014)	0.216*** (0.014)	0.179*** (0.015)	0.169*** (0.015)
Internet users	0.305*** (0.019)	0.318*** (0.019)	0.329*** (0.018)	0.314*** (0.019)	0.327*** (0.019)	0.319*** (0.019)
Marketization	0.113*** (0.011)	0.093*** (0.012)	0.087*** (0.011)	0.104*** (0.012)	0.008 (0.013)	0.020 (0.013)
Green-tech FDI		-0.073*** (0.005)	-0.076*** (0.005)	-0.091*** (0.006)	-0.080*** (0.006)	-0.078*** (0.006)
Moderators						
Accessibility to foreign firms			-0.023 (0.052)			0.001 (0.052)
Green-tech FDI x Accessibility to foreign firms			0.049*** (0.009)			0.024** (0.009)
Accessibility to domestic firms				-0.034*** (0.009)		-0.066*** (0.009)
Green-tech FDI x Accessibility to domestic firms				0.022*** (0.003)		0.006** (0.003)
Research resources					0.212*** (0.017)	0.244*** (0.017)
Green-tech FDI x Research resources					0.029*** (0.003)	0.020*** (0.004)
Constants	-3.772*** (0.273)	-4.308*** (0.274)	-4.274*** (0.273)	-4.510*** (0.273)	-4.424*** (0.272)	-4.402*** (0.274)
N	4886.000	4886.000	4886.000	4885.000	4886.000	4885.000

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$



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MS0020: The Adoption of Technology and Perceived Employability of Workers with Visual Impairments

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The Adoption of Technology and Perceived Employability of Workers with Visual Impairments

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Extended Abstract

This study explores the adoption of technology on professional ability development and self-perceived employability of workers with visual impairment. Results of 204 valid responses from self-completed online surveys showed that technology adoption positively affects self-perceived internal and external employability. Additionally, professional ability development mediates the relationship between technology and self-perceived employability. The findings advance the existing theories and offer practical implications regarding human resource management and career development, especially for workers with disabilities.

Keyword: Adoption of Technology; Workers with Disabilities; Employability; Human Resource

1. Introduction

In contemporary workplaces, integrating technology has transformed how workers perform tasks. For individuals with disabilities, adopting assistive technologies plays a pivotal role in enhancing their professional abilities and shaping their internal and external employability. The adoption of technology examines how users perceive and utilize technological innovations based on their perceived usefulness and ease of use (Venkatesh et al., 2003). For workers with visual impairments, technologies such as screen readers, magnification software, and voice recognition systems are crucial tools that enable them to navigate and perform tasks effectively in their professional environments (Kelly, 2009).

This study explores the interplay between technology adoption, professional ability development, and self-perceived employability among workers with visual impairments. By integrating insights from the unified theory of acceptance and use of technology (UTAUT), this research aims to comprehensively understand how technological advancements and skill development help improve the employment of people with visual impairment, thus shaping employability in this unique demographic. Understanding these dynamics can theoretically advance technology acceptance and career development. Also, the study informs practical strategies for enhancing workplace inclusivity and empowering individuals with visual impairments to thrive in diverse professional settings.

2. Theory and Hypotheses Development

The unified theory of acceptance and use of technology (UTAUT) aligns with four main aspects: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy directly relates to how workers perceive the usefulness of assistive technologies in enhancing their job performance. Effort expectancy reflects the ease of use of assistive technologies. Social influence indicates the degree to which an individual perceives that others believe they should use technologies. Facilitating conditions are for the organizational support and technical infrastructure for skill development (Venkatesh et al., 2003). The theory explains how technology adoption affects one's career trajectory and employment opportunities.

Adoption is defined by Bruning and Campion (2018) as the intentional and active use of technology to improve a work process or knowledge in a job. Employment opportunities are typically regarded either inside the existing organization (i.e., internal employability) or with a different organization (i.e., external employability) (Farashah et al., 2023; Forrier et al., 2015). According to UTAUT, if workers with visual impairments perceive that assistive technologies will significantly enhance their job

performance, they are more likely to adopt them. This adoption increases their confidence in their ability to perform tasks effectively within their current organization, thereby improving their self-perceived internal employability. When workers with visual impairments adopt assistive technologies due to high-performance expectancy and supportive conditions, their skill set and professional capabilities are enhanced. This improvement makes them more competitive in the broader job market, thus increasing their self-perceived external employability. Besides, when the external job market provides infrastructure and technical support, visually impaired workers with higher professional abilities will be more likely to view themselves as employable outside their current organization. Thus, it is hypothesized:

H1: The adoption of technology is positively related to self-perceived internal employability.

H2: The adoption of technology is positively related to self-perceived external employability.

Professional ability development refers to the enhancement of career-related knowledge, skills, abilities, and experiences (Weng et al., 2010). Through technology adoption and effective use by workers with visual impairments, they have acquired professional abilities in their career trajectory. The process enhances their job performance despite visual impairments, increasing self-perceived internal employability. Additionally, facilitating conditions further promotes the adoption of technologies, contributing to professional ability development. Similarly, the increased professional ability development makes workers more attractive candidates for employment outside their current organization, thereby growing self-perceived external employability. Lai (2017) also demonstrated that a good fit between task and technology positively affects performance across various contexts. Hence,

H3a: Professional ability development mediates the relationship between the adoption of technology and self-perceived internal employability.

H3b: Professional ability development mediates the relationship between the adoption of

technology and self-perceived external employability.

3. Method and Results

The samples are workers with visual impairment who have been working continuously for over three months. There is a two-week interval between the first and second waves of online data collection. Finally, 204 valid responses were generated from 280 participants. At time 1, participants completed surveys for demographics (age, gender, education, and job location) and technology adoption. At time 2, they finished the part of professional ability development and self-perceived employability. In total, 45.6% of the respondents were aged 26 to 35, 58.8% were male, 38.2% were in junior college, and 82.4% worked in the city. All constructs were measured using a five-point Likert scale. The author measured the adoption of technology by Bruning and Campion (2018) with five items, such as “use new knowledge or technology to enhance communication.”; Professional ability development was measured by Weng et al. (2010) with four items, such as “my present job encourages me to continuously gain new and job-related skills”; Self-perceived internal employability and external employability were measured by De Cuyper and De Witte (2010) with four items respectively, such as “I am optimistic that I would find another job with this employer if I looked for one” and “I am optimistic that I would find another job elsewhere if I looked for one.”

Structural equation modeling (SEM) with AMOS24.0 was employed to analyze the data. The Cronbach’s alpha of each construct was above 0.862 (>0.70), demonstrating a high reliability (Hair, 2011). Factor loadings of all items were above 0.808, the average variance extracted (AVE) values and composite reliability (CR) of every construct were at least 0.706 and 0.906, demonstrating convergent reliability. Table 1 shows correlations across all the constructs, and each square root of AVE was greater than the inter-construct correlations, indicating discriminant validity. Hypotheses were tested using

bootstrapping with 5000 samples and 95% confidence interval. The model has a good fit: $\chi^2/DF = 2.097$ (< 3.000), $p < 0.001$; GFI = 0.890; CFI = 0.961; NFI = 0.928; and RMSEA = 0.073. The bootstrapping procedure with 5000 resamples and 95% confidence level was employed to test hypotheses. From the results, technology adoption positively affects the perceived internal employability ($\beta = 0.209$, $p < 0.05$) and external employability ($\beta = 0.207$, $p < 0.05$). Professional ability development mediates the relationship between technology and perceived employability in either internal organizations ($\beta = 0.104$, $p < 0.05$, CI = [0.026, 0.181]) or external organizations ($\beta = 0.076$, $p < 0.05$, CI = [0.003, 0.149]). In the indirect effect, 95% confidence intervals do not contain zero. Thus, all the hypotheses were supported.

Table 1. Correlations and Discriminant Validity Results.

	1	2	3	4
1. Adoption of technology	0.875			
2. Professional ability development	0.405**	0.840		
3. Self-perceived internal Employability	0.315**	0.336**	0.901	
4. Self-perceived external employability	0.282**	0.265**	0.877**	0.930
Mean	4.133	4.050	3.311	3.290
Standard deviation	0.842	0.813	1.108	1.118

** Correlation is significant at the 0.01 level; the bold numbers are the square roots of the AVE values

4. Conclusion

This research demonstrated how assistive technologies bridge the gap between disability and employability, enriching the UTAUT theory and contributing to technology adoption with the career development of workers with visual impairment. Organizations should invest in assistive technologies to foster a supportive environment for encouraging adoption, such as providing necessary training, cultivating an inclusive culture, and ensuring robust technical infrastructure. These measures will empower workers to enhance their job performance and competitiveness in the broader job market. Besides, organizations are suggested to consider leaving more employment opportunities for workforces with disabilities who have professional abilities.

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MS0022: Building Bridges or Barriers? The Role of Community Culture in Online Knowledge Sharing

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Building Bridges or Barriers? The Role of Community Culture in Online Knowledge Sharing

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Extended Abstract

With the rapid advancement of the Internet in recent years, online communities have become increasingly prevalent. Sustaining these communities hinges on enhancing members' intention to share knowledge. Previous studies have extensively explored the factors influencing community members' knowledge sharing intentions from various aspects. Our study offers an unique perspective: online community culture. We investigate the underlying mechanisms linking community culture and members' knowledge-sharing intentions, distinguishing between aggressive and supportive cultures. We propose that these cultures affect knowledge-sharing intentions through psychological safety, with stronger effects when extrinsic motivations are high. Our expected findings provides both theoretical and practical contributions.

Keywords: Online community, Culture, Knowledge-sharing, Social capital theory.



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MS0024: The Impact of Online Word-of-Mouth and Influencer Marketing on Art Toy Purchase Decisions: A Systematic Review and Proposed Methodology

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The Impact of Online Word-of-Mouth and Influencer Marketing on Art Toy Purchase Decisions: A Systematic Review and Proposed Methodology

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This study presents a systematic review of literature on art toy research and proposes a methodology to investigate the influence of online word-of-mouth (WOM) and influencer marketing on the decision to purchase art toys, mediated by brand image among working adults in Thailand. The art toy market has experienced significant growth in recent years, driven by social media, collector communities, and innovative marketing strategies. This research aims to synthesize existing knowledge on art toy consumer behavior and develop a comprehensive framework for understanding the factors influencing purchase decisions in this unique market segment.

Keywords: Art toys, Online word-of-mouth, Influencer marketing, Brand image, Purchase decision

1. Introduction

Art toys, also known as designer toys or urban vinyl, have emerged as a significant niche within the broader toy and collectibles market. These limited-edition, often handcrafted items blend elements of pop culture, fine art, and product design, appealing to a growing audience of adult collectors and enthusiasts (Steinberg, 2010). The art toy market has experienced explosive growth in recent years, with companies like Pop Mart leading the charge and transforming the industry landscape.

Pop Mart, a Chinese company founded in 2010, has become a global phenomenon in the art toy market. Its success has been particularly notable in Southeast Asia, with Thailand emerging as one of its best-selling markets. The company's strategy of releasing limited-edition "blind box" figurines has created a frenzy among collectors, with new launches often selling out within seconds. This scarcity-driven demand has not only boosted sales but also cultivated a dedicated fan base and vibrant collecting community (Chou, 2021).

The remarkable success of Pop Mart in Southeast Asia, especially in Thailand, demonstrates the growing appeal of art toys among working adults and young professionals. Every new launch experiencing rapid sell-outs has created a self-reinforcing cycle of demand, further fueling the market's growth and highlighting the potential of this niche segment in the global toy industry (Leung, 2021).

This study aligns with the conference theme "Re-imagine International Business: Accelerate Growth through Collaboration and Digital Transformation" by exploring how digital technologies and online communities are reshaping the art toy industry. The research examines the role of online word-of-mouth (WOM) and influencer marketing in driving consumer behavior, highlighting the importance of digital transformation in this niche market. Furthermore, by investigating the collaborative nature of art toy creation and promotion, this study contributes to our understanding of how businesses can leverage digital platforms and global networks to accelerate growth in specialized markets.

This study aims to address two primary research objectives:

1. To conduct a systematic review of existing literature on art toy research, with a focus on consumer behavior, marketing strategies, and market trends, including the recent success of companies like Pop Mart in Southeast Asia.

2. To propose a methodology for investigating the influence of online word-of-mouth (WOM) and influencer marketing on the decision to purchase art toys, mediated by brand image among working adults, with particular attention to the Southeast Asian market.

By addressing these objectives, this research seeks to contribute to the growing body of knowledge on art toy consumption and provide valuable insights for marketers, designers, and retailers operating in this unique market segment. Moreover, it offers a perspective on how digital transformation and global collaboration are reshaping international business practices in niche markets, aligning with the conference's focus on reimagining international business in the digital age.

2. Literature and Framework

2.1 Systematic Review Methodology

To conduct a comprehensive review of art toy research, we employed a systematic literature review approach following the PRISMA guidelines (Moher et al., 2009). The search strategy included the following steps. (1) Firstly, database selection was retrieved from Web of Science, Scopus, EBSCO, and Google Scholar. (2) Search was conducted with on focused terms which are "art toys," "designer toys," "urban vinyl," "toy collecting," "adult toy consumers," "art toy marketing," and related variations. (3) The main selection criterion are peer-reviewed articles, conference proceedings, and book chapters published between 2000 and 2023, in English. (4) the exclusion criterion are studies focusing solely on children's toys, non-academic sources, and articles not directly related to art toy consumption or marketing.

The initial search yielded 487 results, which were screened based on title and abstract relevance. After removing duplicates and applying inclusion/exclusion criteria, 103 articles were selected for full-text review. The final sample consisted of 68 articles that met all criteria and were included in the systematic review.

2.2 Key Findings from the Systematic Review

The systematic review revealed several key themes and gaps in the existing literature on art toy research can be divided into 2 main drivers influencing the decision making of art toys: target consumers and motivations and online marketing strategies. Firstly, in terms of target consumers and motivations, prior studies have highlighted the diverse demographics of art toy consumers, with a growing focus on working adults as a key market segment (e.g., Atılgan, 2014; Steinberg, 2010) and identified various motivations for art toy collecting, including nostalgia, self-expression, investment potential, and social status within collector communities (e.g., Heljakka, 2013; Phoenix, 2006) and most interestingly art toy has becoming popular owing to the cultural significance of art toys as a form of contemporary art and their influence on popular culture (e.g., Steinberg, 2010; Wilson, 2017). Secondly, online market strategies in the form of influencer marketing and brand collaborations brought about a strong impact on the global popularity of art toys. The importance of digital platforms and social media in fostering art toy communities and driving consumer engagement has been emphasized in multiple studies (e.g., Fournier & Lee, 2009; Heljakka, 2018). The role of artist and brand collaborations in creating value and driving consumer interest in art toys has been explored by several researchers (e.g., Kozinets et al., 2010; Yoon, 2019). In addition to that, various supporting marketing activities were used in the art toy industry, including limited editions, event-based sales, and social media campaigns (e.g., Lash & Lury, 2007; Yoon & Choi, 2014).

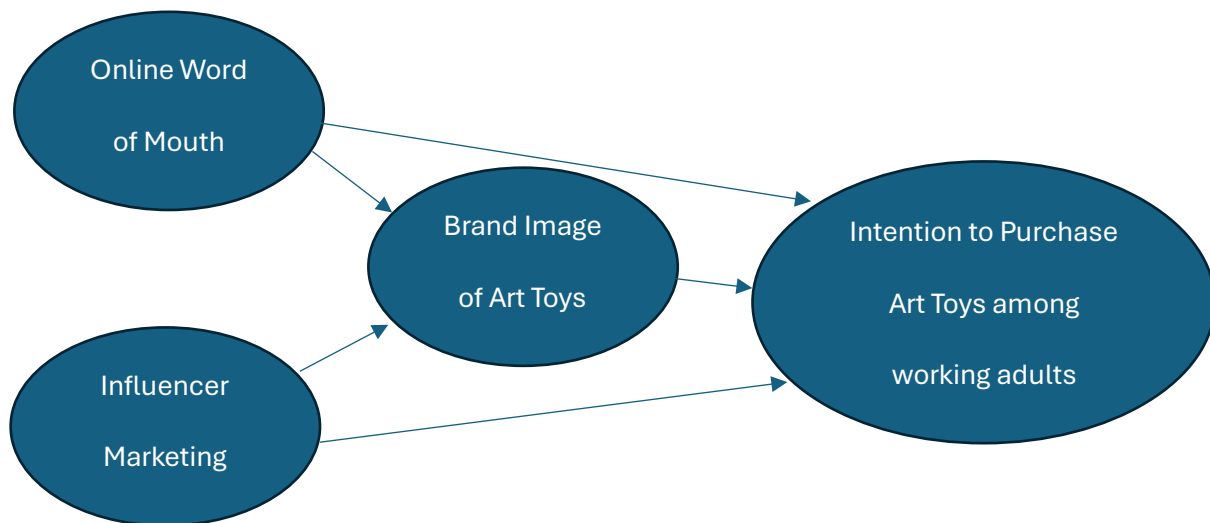
2.3 Research Gaps and Opportunities

Despite the growing body of literature on art toys, several research gaps were identified. Firstly, limited empirical studies on the factors influencing art toy purchase decisions among working adults and lack of

quantitative research examining the impact of online WOM and influencer marketing on art toy consumption. Furthermore, insufficient exploration of the mediating role of brand image in art toy purchase decisions.

2.4 Conceptual Framework

Based on the systematic review findings and identified research gaps, the following conceptual framework is proposed to guide our investigation:



The framework posits that online word-of-mouth and influencer marketing influence the decision to purchase art toys among working adults, with brand image acting as a mediating variable. This model draws on the Theory of Planned Behavior (Ajzen, 1991) and the Elaboration Likelihood Model (Petty & Cacioppo, 1986) to explain the cognitive and social processes involved in art toy purchase decisions.

3. Method and Results

3.1 Proposed Methodology

To investigate the proposed conceptual framework, we suggest a mixed-methods approach combining quantitative and qualitative research techniques. The population of this study is the working adults aged 25-45 years old in Thailand. Phase 1 Qualitative Exploration involves semi-structured interviews with 20-30 art toy collectors and industry experts to refine the conceptual framework and identify key variables and netnographic analysis of online art toy communities to understand WOM dynamics and influencer interactions. Phase 2 Quantitative Analysis continues with the development and validation of a survey instrument based on Phase 1 findings and existing literature before proceeding to the online survey among 500-700 working adults (aged 25-45) who have purchased or considered purchasing art toys in the past 12 months. Then, the data will be analyzed with structural equation modeling (SEM) to test the proposed relationships in the conceptual framework.

3.2 Measures

The following key constructs will be measured using validated scales adapted from previous research as follows. Online word of mouth will be adapted from Chevalier & Mayzlin (2006) and Hennig-Thurau et al. (2004). Influencer Marketing will be adapted from Lou & Yuan (2019) and De Veirman et al. (2017). Brand Image will be adapted from Keller (1993) and Low & Lamb Jr (2000). Lastly, purchase decision will be adapted from Dodds et al. (1991) and Spears & Singh (2004). Control variables will include demographic factors, prior art toy purchase experience, and general attitudes towards collecting.

3.3 Data Analysis

Quantitative data will be analyzed using SPSS and MPlus software. Confirmatory factor analysis (CFA) will be conducted to assess the measurement model, followed by structural equation modeling (SEM) to test the hypothesized relationships. Mediation analysis will be performed using the bootstrapping method (Hayes, 2017).

3.4 Expected Results

Based on the proposed methodology and existing literature, the following results are anticipated.

(1) Online WOM and influencer marketing will have significant positive effects on the decision to purchase art toys among working adults. (2) Brand image will partially mediate the relationship between online WOM/influencer marketing and purchase decisions.

4. Discussion

This study contributes to the growing body of literature on art toy consumption by proposing a comprehensive framework for understanding the factors influencing purchase decisions among working adults. By integrating online WOM, influencer marketing, and brand image into a single model, we offer a nuanced perspective on the complex interplay of factors shaping consumer behavior in this unique market segment. The proposed methodology addresses several gaps in existing research by employing a mixed-methods approach that combines qualitative insights with quantitative analysis and experimental design. This approach allows for a more holistic understanding of art toy consumption patterns and the effectiveness of various marketing strategies. Practical implications of this research include guidance for art toy designers and manufacturers in developing marketing strategies that leverage online WOM and influencer partnerships effectively. Furthermore, insights for retailers and e-commerce platforms on optimizing their brand image and customer engagement strategies to appeal to working adult consumers and Recommendations for social media platforms and online communities in fostering meaningful interactions between art toy enthusiasts, influencers, and brands.

Limitations of the proposed study include its focus on working adults, which may limit generalizability to other consumer segments. Additionally, the cross-sectional nature of the survey data may not capture long-term trends in art toy consumption. Future research could address these limitations by conducting longitudinal studies and exploring cross-cultural differences in art toy purchasing behavior.

In conclusion, this study provides a foundation for further empirical investigation into the factors influencing art toy purchase decisions among working adults. By systematically reviewing existing literature and proposing a comprehensive methodology, we contribute to the theoretical understanding of this growing market segment and offer practical insights for industry stakeholders.

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MS0026: Empirical Study of the Influences of Adversity Quotient and Emotional Intelligence on Teamwork Performance

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Empirical Study of the Influences of Adversity Quotient and Emotional Intelligence on Teamwork Performance

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ABSTRACT

This study undertook surveys on the students participated in management related class to discover their teamwork performance related influence factors including adversity quotient and emotional intelligence. The input-process-output concept is applied to explore the relationship among variables such as adversity quotient, emotional intelligence, communication efficiency, conflict, and teamwork performance. Total valid questionnaire sample is 336. This research finds the adversity quotient has partial influences on communication efficiency, conflict, and teamwork performance. Emotional intelligence has significant influences on communication efficiency, conflict, and teamwork performance. Communication efficiency, and conflict have significant influences on teamwork performance.

Keywords: Adversity Quotient, Emotional Intelligence, Communication efficiency, Conflict, Teamwork Performance.

1. INTRODUCTION

Teamwork is important to business and organizational success. Team members abilities can have a significant impact on their team's productivity, morale, and overall performance. One key aspect of capability that is often looked is team members' adversity quotient (AQ). AQ refers to an individual's ability to understand, manage, and regulate their emotions, as well as the emotions of others. Such intelligence abilities as empathy, self-awareness, self-regulation, motivation, and social skills (Rowinski, 2023) are all included. Team members with high AQ can navigate complex and challenging situations with ease and can inspire their peers to do the same. When team members can understand and respond to each other's emotions, which can help to build trust and create a positive work environment (Rowinski, 2023). Particularly, team members with high AQ are often able to handle stress and pressure with ease, which enables them to perform at their best even in the most difficult situations.

The concept of Adversity Quotient (AQ) is about the capacity of individual to bounce back from adversities (Stoltz, 1997). AQ is indicators of a person's ability to cope with adversity. According to Phoolka and Kaur's (2012) observation, AQ presents a new approach gaining research interests in the organizational field. Paramanandam and Shwetha (2013) have explored the relationship between AQ and demographic factors (such as age, and income group).

Somarathne, et al. (2019) have explored the effect of adversity quotient sub-dimensions on employee stress. Past studies on AQ are in the organizational context (Langvardt, 2007), paying less attention to academic fields.

Many organizations concern what are the basic qualifications of applicants. Some of leading organizations apply emotional intelligence (EQ) and/or adversity quotient assessment. Emotional intelligence and adversity quotient assessments are important for organizations to know if their applicants for the jobs' positions are ideal personnel to hire. These two tests also prevail in leading organization to know their employees in developing their own growth. Several educational institutes also applied emotional intelligence and/or adversity quotient to know their members. EQ is regarded as a series of emotions, personality and interpersonal capabilities that influences one's capability to cope with the stress of the need in the environment (Bar-on, 1997). Therefore, EQ is one of basic qualifications for an organization to screen their employees for doing particular jobs.

The AQ is currently used for the Applicant Screening and the Development for establishing a vital baseline for growing one's AQ by many famous leading industry and educational organizations such as: Amazon, JP Morgan, AT&T, P&G, Deloitte, Marriott, Massachusetts Institute of Technology (MIT), Harvard Business School. Corporate or educational organizations typically use the AQ to screen applicants, develop leaders, or to transform their cultures, people and results (Stoltz & Grant, 2019).

Individual reaction to conflict conditions differs, as does the method of handling them in teamwork process. AQ in relation to teamwork conflict and communication efficiency is less discussed. Past literature has explored the overall AQ of a person with only limited studies emphasizing the effect of its sub-dimensions with other variables. Langvardt (2007) has used AQ sub dimensions in exploring the relation to commitment to change. Regarding teamwork conflict and communication efficiency, further research is required to understand the effect of CORE dimensions. Huijuan (2009) has provided conflicting evidence on the relationship between demographic factors and AQ. Hence, there is an opportunity to explore the impacts of both emotional intelligence quotient and adversity quotient on teamwork communication efficiency and conflict, and teamwork performance.

In the education fields, students are requested in completing teamwork with each other that is often seen in many Management Colleges in the university. The capability in solving problem and overcoming all difficulties becomes very important nowadays. Especially, several assignments involve cooperations with other team members to complete the teamwork task. In the teamwork, communication efficiency is relevant to the success in conducting tasks. When

team members are from different background, because of heterogeneity, conflicts often occur and they need to have more communication skills. Therefore, with sufficient emotional intelligence and/or adversity quotient, team members may be able to overcome all the conflicts and raise efficiency in conducting teamwork tasks. Thus, there is fewer related literature available on discovering the relationships among adversity quotient and emotional intelligence, communication efficiency and conflict, and teamwork performance. To build up teamwork is for training students leaning cooperation skills in completing the task assignments. During teamwork building process, the important factors including communication efficiency and conflicts, may have significant influences on their team work performance.

Currently, there are not many teamwork performances literature based on observations on the variables in terms of adversity quotient and emotional intelligence, communication efficiency and conflict issues in education business particularly. Therefore, there is an opportunity to pay extra attention on this area of observation and research. The previous literature often observed teamwork based on the input-process-output approach such as McGrath's input-process-output model (Gladstein, 1984; Horwitz, et al., 2006; Jewell & Reitz, 1981; and Schwarz, 1994). Input variables are often seen in discussing the characteristics of team members by using big five personality (Barrick & Mount, 1991; Salgado, 1997), homogeneity or heterogeneity, or other characters (Amabile, 1994; Ancona & Caldwell, 1992; Byrne, 1971; Gruenfeld, 1995; Gruenfeld, et al. 1996; Jackson, et al. 1992; Karn, et al, 2007; Smith, et al., 1994; Williams & O'Reilly, 1998), etc. Siem and Murray (1994) have found that personality-factors affecting performance. There is an opportunity to consider team members' characteristics based on AQ and EQ. Process variables are often seen in discussing communication efficiency, communication frequency, trust, or conflict (Ancona and Caldwell, 1992; Bantel & Jackson, 1989; De Dreu & Weingart, 2003; Smith et al. 1994) etc. Apparently, communication and conflict variables may have the relationships with team members' AQ and EQ. Output variables are often seen in discussing teamwork performance, or team cohesiveness, etc. Team cohesiveness can be observed its relationship with other influencing variables such as AQ and EQ, communication efficiency and conflict.

In viewing above limitations in literature, this research finds an opportunity to explore the relationships among sets of variables. The overall research objective is to explore the relationships among emotional intelligence, adversity quotient, communication efficiency, conflict, and teamwork performance. This research attempts to adapt the concept of input-process-output approach to observe teamwork performance. Research issues are: (a) to examine the influences of emotional intelligence and adversity quotient on team communication efficiency and conflict, (b) to examine the influence of communication efficiency and conflict on teamwork performance, (c) to examine the influences of emotional intelligence and

adversity quotient on teamwork performance, and (d) to identify the role of adversity quotient on the relationship with demographic factors such as age and gender. However, this research attempts to discover the influences of adversity quotient sub-dimensions, and emotional intelligence in terms of adaptability in problem solving, on the teamwork process in terms of communication efficiency and conflict, and on consequent teamwork performance.

2. LITERATURE REVIEW

This section focuses on literature review in terms of adversity quotient, emotional intelligence, communication efficiency, conflict, and teamwork performance.

2.1. Adversity Quotient (AQ):

The Adversity Quotient (AQ) Profile was developed by Stoltz (1997, 2000, 2015) that involved indicators to measure individuals' ability to cope with adversities. Stoltz (2015) integrated grit, resilience, and human interface with adversity. Adversity quotient can be interpreted as individual's response to adversities or challenges faced (Singh & Sharma, 2017). Ability to deal with adversities can accumulated through life experience (Shen, 2014). Individuals with higher levels of AQ can cope better with adversities by turning difficulties into opportunities (Stoltz, 1997). AQ has four dimensions in terms of control, ownership, reach, and endurance. Stoltz and Grant (2019) have tested four dimensions of the AQ Profile that the results showed the four subscales are related, but still measure unique concepts.

According to the observations of Stoltz, (1997 & 2000) and Stoltz & Weihenmayer (2008), the AQ originates from more than 1,500 studies spanning various subfields of psychology, neurology, biochemistry, psychoneuroimmunology, endocrinology, cultural anthropology, molecular genetics, and neuropsychology, etc. The assessment of adversity quotient is intended to provide more insights into both the quality and quantity of individuals' hardwired pattern of response to adversity. Stoltz (2000) and his team of researchers still put more efforts on ongoing improvements and evolution of the AQ assessment.

The items used to assess adversity response patterns include the four CORE dimensions in terms of control, ownership, reach, and endurance, which together comprise and describe an individual's AQ (Stoltz, 1997). AQ assessment (Stoltz, 1997) covers the subject's perception of and response to a diverse series of hypothetical adverse events. Control involves an individual perceives as having control or influence over adversity situations (Stoltz, 1997). Individual has control influences on the direction of the action, level of effort, and perseverance. A person with strong control aspect tends to be proactive in adversity situations and can turn adversity into opportunity (Stoltz, 1997). Such person will exert more effort with higher levels of resilience and perseverance in attaining assigned tasks successfully (Hung & Chin, 2013). Ownership

involves the degree of accountability a person feels to improve the outcome of adversity situations (Stoltz, 1997). With higher AQ, a person will feel accountable for the adversity situations to face them with responsibility. People learn from past experiences, change their strategy of dealing with the situations from time to time, and take necessary action to complete the tasks. People are responsible for their own deeds, and make the outcomes into learning opportunities. Reach is about a person perceives the influences of adversity into other areas of life (Stoltz, 1997). A person with higher AQ does not let adversity reach other facets of life. Adversity is considered as specific and limited to one situation. People are well prepared to deal with adversity for they feel empowered (Stoltz, 2000). Endurance involves an individual's perception of the duration the cause of adversity and how long adversity will last (Stoltz, 1997). People with high AQ perceive adversities as temporary and will have solutions to overcome them. Such people are optimistic and energetic in coping with adverse events (Stoltz, 2000). Resilience, longevity, performance, and response to change are found to be predictable with respect to an individual's AQ level (Phoolka & Kaur, 2012).

According to Singh & Sharma (2017), when undesirable or trying circumstances result in tension or strain either mentally or emotionally, it is stress. Stress can be from physical like some threat or danger to emotional such as tension or worry at job. These conditions may be related to overload of work leading to burnout or lack of coordination among the team causing bottlenecks and unnecessary delays. In Strivastava and Singh's (1981) occupational stress's twelve dimensions, including role overload (too many expectations being communicated), role conflicts (disagreement over the goals to attain or the methods to be used), and poor peer relations, often lead to unpleasant and explosive situations that can explain why team members often have conflicts and stresses.

Prakaew and Leesatturpai (2017) find that increase in AQ decrease in stress. Higher AQ levels lead to lower stress levels. Shen (2014) regards that AQ develops the attitudes and capability of a person to deal with stressful situations. Team members in their coordination to complete team tasks would have opportunities to face stressful situation. Especially, students participate in teamwork to finish assignment and face how to communicate with their team members and how to share work loadings. A lot of unexpected stressful situations would occur. According to Stoltz (2000), a person with higher AQ levels can control events that create adverse circumstances, has sense of accountability towards the outcome of the adverse situation, not allow the effect of adversities to reach other areas in life, and sees adverse events as temporary. Somaratne, et al. (2019) think that perceived stress can be predicated through individual's AQ. Higher AQ levels lead to lower stress levels. AQ allows a person to deal with stressful situations (Shen, 2014). Trevisani (2015) has observed undergraduates that increase in age decrease in perceived stress of students. However, students normally with younger age and less experience,

participate in teamwork that would have more practices opportunities and would have more benefit through incorporation of AQ management practices.

Singh & Sharma's (2017) empirical findings reveal that there is a significant correlation between adversity quotient and occupational stress which implies that IT professionals in any adverse situation can successfully manage their occupational stress. They also found that role over-load, role conflict, under participation, poor peer relations, and strenuous working conditions are significantly correlated with adversity quotient. They think that if the IT professional work towards enhancing their adversity quotient, then they will have a significant work life balance, be more satisfied, contented, motivated and above all managing themselves in adverse situations and therefore coming out successfully and thus handling the various stress which comes from a dynamic, competitive environment will become easy and coping up with it less difficult.

Somaratne, et al. (2019) have investigated the relationship between adversity quotient (AQ) and levels of perceived stress of middle-level managers employed in the Sri Lankan Non-Governmental Organizational sector. They have found that age, work experience, and academic qualifications significantly influence the level of AQ. They also find that dimensions of AQ can predict the variance in perceived stress. Their empirical findings signify that stress model can consider addition of AQ in future research, and AQ can serve as an important factor in training and development, selection process, and performance management. Somaratne, et al. (2019) also think that AQ is a mental capacity that extends beyond the masculine and feminine traits of people because other researchers (Bantang et al., 2013; Huijuan, 2009) and their empirical findings show gender has no significant influence on the level of individual's AQ. On the contrary, De Gulan, et al. (2013) have found that women have higher mean scores of AQ compared to men.

Huijuan (2009) finds age has no significant influence on AQ. On the contrary, the findings of Somaratne, et al. (2019) and Paramanandam & Shwetha (2013) show that increase of AQ with age. Their findings confirm that experience and encounters have possibly made individuals with older age more resilient and better able to cope with adversity, and thus superior to individual with younger age. The more difficulties an individual experiences, the more that individual learns how to deal with them (Stoltz, 1997). Individuals participate teamwork would encounter a lot of difficulties and hardship, and conflicts may occur, they will need to learn a lot of efficient communication skills to cooperate with each other to complete team tasks. Therefore, it would be interested in knowing the influences of AQ on teamwork process and performance.

Matore, et al. (2015) have found that those who perform better in the academic field are also

found to be intelligent in dealing with adversities. Tripathi (2011) has identified a significant difference in adversity quotient based on academic qualifications that Somaratne, et al. (2019) also have the same findings. Bantang et al. (2013) have different observation from the above that they find academic qualifications have no such influences on AQ. However, literature indicates the opportunity to study adversity quotient's influences on teamwork process and performance. Therefore, this research attempts to apply the concept of adversity quotient to observe the relationship with teamwork performance.

According to Rowinski (2023), team leader can develop and improve their self-awareness, empathy, self-regulation, motivation, and social skills. Team leaders with high AQ can recognize and understand their own emotions and how they impact their behavior. Team leaders with high AQ can understand and respond to the emotions of others. Team leaders with high AQ can regulate their emotions and respond in a way that is appropriate for the situation. Team leaders with high AQ can motivate themselves and others. Team leaders with high AQ can build strong relationships with others and are able to effectively communicate and collaborate with their team members. Above literature indicates the important influences of AQ on teamwork process, however.

Four dimensions of adversity quotient can be applied to explain the teamwork performance. Control is eventually important concept for team leader and team members in coordinating their team tasks. They must believe they can complete the tasks of teamwork. The ownership characteristics they show in highly perform teamwork are such as high accountability and responsibility, and deeply engaged in improving the difficulty situations with active actions. When doing teamwork, team members with lower communication efficiency, or high conflict situation, high stresses will occur. Therefore, if team members have greater efforts in solving the problems or difficulties they face, they will try to affect the situation and tend to have better cumulative effects put on those (high reach). If team members have high hope and optimism in completing their teamwork (high endurance), they can overcome the difficulty situations more efficiently. Obviously, four dimensions of adversity quotient have significant influences on teamwork, especially on communication efficiency and conflict. Therefore, this research has the following hypotheses:

H1: Adversity quotient has significant influence on communication efficiency of teamwork.

H2: Adversity quotient has significant influence on conflict of teamwork.

2.2. Emotional Intelligence:

EQ was based on Thorndike's (1898) idea of "social intelligence," which he originally recognized in 1920. Thorndike (1898) explained social intelligence as the capability to

comprehend and manage people to act wisdom in the relationships between human. According to Thorndike (1898), Gardner (1993) involved social intelligence as one of seven intelligence spheres in the theory of multiple intelligences. Salovey and Mayer (1990) were the first one to raise the name of “emotional intelligence” to state the skills of individuals to handle with their emotions. Bar-On et al. (2006) have found the Impact of emotional and social intelligence on performance. Previous study has tried to link emotional intelligence and performance at work.

Emotional intelligence (EQ) is a hot issue among academics and experts in the fields of psychology, education, and management (Mayer et al., 2008; Shapiro, 1997; Weisinger, 1998). Emotional intelligence refers to the ability to recognize emotional problems and changes in oneself and others, and involves managing one's emotions, making wise decisions, developing good interpersonal relationships, dealing with different stresses, and sustaining life motivation. In the 1980s and 1990s, several psychologists developed different theories about emotional intelligence. Many scholars construct the theory of emotional intelligence. Due to the different perspectives on the interpretation of emotional intelligence, there are mainly three representative frameworks: the first one is Mayer and Salovey's (1997) emotional intelligence theory that emphasizes cognitive ability; the other is Goleman's (1995) performance-oriented emotional intelligence theory; and third one from Bar-on (1997, 2004, 2006a, 2006b, 2007) is the emotional intelligence theory that emphasizes mental health or personality orientation.

Salovey & Mayer (1990) have defined emotional intelligence (EQ) as the ability to monitor one's own and others' moods and emotions, to discern between them, and to utilize this knowledge to lead one's thinking and actions. Goleman (1995) thinks EQ is self-awareness, controlling emotions, inspiring oneself, sympathy, and relationship management are all examples of EI talents. Bar-on (1997) regards EQ as a series of emotions, personality and interpersonal capabilities that influences one's capability to cope with the stress of the need in the environment. Wong and Law (2002) think that EQ includes an indication of individual's mind and feeling, skills, opinion, and how to apply the moods and emotional intelligence. EQ indicates the ability to understand and influence others, besides, the skills to behave successfully in interpersonal situations. Ghaonta & Kumar (2021) indicate that EQ is a theory that expresses an individual's ability to control motivation, and to show sympathy and energy confronted with the adversity while remaining resilient and adaptable.

Mayer and Salovey (1997) first proposed the framework of emotional intelligence, and the framework contains three levels: correctly assessing and expressing the emotions of others, properly regulating one's own and others' emotions, and using emotions to plan creativity and motivate actions. In Goleman's (1995) emotional intelligence theory, it explained the importance of five emotional competencies to people. Firstly, people must have the ability to

recognize their own emotions, to be aware of their own inner feeling, personalities, preferences, motivations, desires, and basic personal values. The second is to be able to effectively manage one's emotions and know how to self-regulate negative emotions. The third is to know how to self-motivate, to self-propel after facing the goals set by oneself, and to improve personal efficiency. The fourth ability is to "put yourself in the shoes" of others to understand their feelings, communication between people not only rely on words, but also through some micro-expressions and body language to understand each other. The last is to learn good social skills and build good interpersonal relationships. Therefore, emotional intelligence is relevant to communication efficiency and conflict. Communication efficiency is extremely important to the success of conducting teamwork task. With better emotional intelligence in problem solving, it can be resulting in higher in teamwork communication efficiency and lower in teamwork conflict.

The concept and theoretical model of emotional intelligence proposed by Bar-on (1997) is the sum of a series of emotions, personality and interpersonal abilities that affect people's ability to cope with the pressure of environmental needs. He believes that emotional intelligence is an important factor that determines whether a person can succeed in life, and directly affects a person's entire mental health. Bar-on (2004, 2006a, 2006b, 2007) further states that emotional intelligence is the social knowledge and ability to affect a range of emotions that effectively respond to environmental demands. To understand the Bar-on model, firstly it's necessary to mention the Emotional Quotient Inventory (EQ-I) which is helpful to form the model. EQ-I operationalizes the Bar-On model. EQ-I includes 133 short statements and uses a 5-point scale with a written answer style that ranges from "very often true of me" (5) to "very seldom true of me" (1). In EQ-I, it consists of 5 composite scales that composite 15 subscales: Intrapersonal (Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, and Self-Actualization); Interpersonal (Empathy, Social Responsibility, and Interpersonal Relationship); Stress Management (Stress Tolerance and Impulse Control); Adaptability (Reality-Testing, Flexibility, and Problem-Solving); and General Mood (Optimism and Happiness). Adaptability in problem solving ability is particularly important in influencing teamwork cooperation. Without these abilities, team members may have more conflicts in their cooperation.

In this study, the EQ-I from Bar-On model (1997) is adopted, including the scale of adaptability comprising problem-solving to measure the influence of emotional intelligence on students' teamwork that students who can objectively corroborate one's feelings and thoughts with reality, modify their emotions and thoughts to new conditions, and tackle challenges of a personal and interpersonal nature efficiently resulting in good teamwork performance. In another words, these indicators aim at how students think problem-solving, and how they deal with the problems they face in their teamwork. Therefore, this research has the following hypotheses:

H3: Emotional intelligence has significant influence on communication efficiency of teamwork.

H4: Emotional intelligence has significant influence on conflict of teamwork.

2.3. Communication Efficiency:

Communication is one of importance key factors in teams' interaction process according to the observations of Gladstein (1984), Horwitz, et al. (2006), Jewell and Reitz (1981), and Schwarz (1994). Good communication can produce high team work performance. Lacking effective communication, team work performance could be bad (Thomas and Schmidt, 1976). Robbins (2002) indicates that team members' work motivation must be stimulated, and there must be existing a good emotion expression channel in performing a better team work.

When task assignment is complicated and uneasy to understand, and for assuring the appropriate strategy to implement and for increasing accuracy of opinion, team members cannot avoid discussion and argument with each other. Therefore, communication frequency will be adjusted and depended on the nature of task assignment. Communication frequency and quality of partners will influence performance of cooperation (Jao, 1997).

Regarding the relationship between homogeneity of team members and communication, according to the observation of Zenger and Laurence (1989), the ages of team members are the same, there will be more interaction between them in their leisure time. The greater differences in their age, the less communication frequency. Communication frequency will influence the consequence of performance. The homogeneity of team members may have influences on team members' communication frequency. The higher homogeneity of team members, the better communication interaction and the more communication frequency. The more communication frequency, the higher efficiency of implementation performance because of reaching consensus on each other's opinions and ideas.

According to Thomas & Schmidt (1976), better communication efficiency is because communication atmosphere is full with honest and trust in the team, and team members can express own opinion clearly and information can be passed quickly and clearly. In addition, team members discuss questions together without personal stubborn which is very important. Team members can combine information, idea and resources in completing the tasks quickly because team member can reach cohesion consensus in solving problems quickly. Above literature indicates the important process of teamwork in terms of communication efficiency. Therefore, communication efficiency can be applied in measuring their influences on teamwork performance.

H5: Communication efficiency has a significant influence on teamwork performance.

2.4. Conflict:

Any teams cannot avoid conflicts because of intensive interrelationship among members. Pondy (1967) indicates that conflicts exist between people, teams, and/or organizations. Process of conflicts includes antecedent conditions such as different targets and deficient resources; emotion situation like tense hostility or anxious; cognition situation such as perception of conflict situation, or receiving obvious attack; and results of conflicts such as frustration occurred by rational disagreement or violent behavior. Conflicts are perceived by inner subjective consciousness because of different opinions of individuals or groups, and different perceptions cause negative feelings or hostility.

Jehn (1994, 1995) divides conflicts into relationship conflicts and task conflicts. Task conflicts belong to task orientation that team members have different opinions, construct, or judgement over task related targets, decision-making or solutions. Relationship conflicts indicate individual emotional orientation that team members have tense situation, angry, hostility or other negative feelings because of them perceived differences or disharmony among them including emotional conflicts and interpersonal relationship conflicts.

When team members' backgrounds are different, they will have different belief structure (Wiersema & Bantel, 1992). Belief structure represents individual cognition, viewpoint or attitude over things. When team members have different belief structure, they will have different preference, and different interpretation of tasks. These differences cause task conflicts. When team members' diversity increase, their belief, cognition, or opinion will be different. And this situation causes task conflicts (Ancona and Caldwell, 1992; Milliken and Martins, 1996; Pelled, 1996). Therefore, team diversity will have positive influences on task conflicts that can be asserted.

The degree of classification and permeability will influence relationship conflicts. Classification means that any individual subconscious mind would divide and classify people. individual tends to have positive viewpoint on the same social background people, and thinks their group of people are more outstanding than other different social background people (Tajfel, 1978; Turner, 1975). Nelson (1989) and Tajfel (1982) think team members may have prejudice or slander language, hostility on different social background people which are relationship conflicts. When a team with different social background members, it can produce different social background hostility. If a team is uneasy permeability, its members will have communication problems which lead to split apart. Therefore, team diversity will have positive

influences on relationship conflicts. Jehn and Mannix (2001) have observations on the dynamic nature of conflict by a longitudinal study of intragroup conflict and group performance. Pelled et al. (1999) have explored the relationships among work group diversity, conflict, and performance. From above literature, conflict can be regarded as process variables in influencing team performance. Therefore, conflict can be applied in measuring their influences on team work performance.

H6: Conflict has significant influence on teamwork performance.

2.5. Teamwork Performance:

Team effectiveness model researches can be classified as descriptive model (Jewell and Reitz, 1981; McGrath, 1964; Nieva, et al., 1978), normative model (Hackman, 1983), empirical model (Gladstein, 1984), heuristic model (Salas, et al., 1992), and others (Campion, et al., 1993; Gersick, 1988; Morgan, et al., 1986; Schwarz, 1994).

Team effectiveness (McGrath, 1964) can be measured by quality, problem-solving, mistakes reducing, work satisfaction, team's cohesiveness, and attitude changes. Nieva, et al. (1978) use team members' characteristics, team characteristics, and task characteristics and demands to measure team performance. Team performance is measured by individual performance and team functional aspects. Jewell and Reitz (1981) measure team performance by internal (such as cohesiveness, compliance, impact, and work satisfaction) and external dimensions (decision-making, different teams' interaction, productivity, and customers' satisfaction). They think performance are influenced by the following factors in terms of team members characteristics (in terms of capability, skills, knowledge, wisdom, personality), team characteristics (in terms of cohesiveness, maturity, role, behavior norm, number of members, tolerance, and heterogeneity), material environment (e.g. nature of task, resource and technology, and space arrangement), social environment (targets and incentives), and team interaction process (in terms of communication, decision making, influence power, cooperation and competition).

Hackman (1983) thinks team effectiveness can be measured by satisfying customers' demands, members' growth, and team's growth, and can be influenced by team design (including task character, team members' characteristics, and team behavior norm), organizational content (including incentives, education training, and information system), and process efficiency (in terms of members' involvement, skills and knowledge, and strategy).

In Gladstein's (1984) model, team effectiveness is measured by performance and satisfaction, and is influenced by team formations (skills, heterogeneity and age of organization and members), team structures (in terms of role and target clarity, work norm, task control, scale,

and leadership), resource accessibility and organizational structure (reward, and supervisory control), and team interactional processes (including open communication, support, conflicts, strategy discussion, individual involvement measurement, and boundary management).

Salas, et al. (1992) measure team performance by quality, time, and mistakes. Team performance can be influenced by team processes (including negotiation, communication, and cooperation) and training (including task analysis, design learning, and principle learning). Team interaction process is influenced by task, work, individual and team characteristics.

According to Kline and McGrath (1998), team performance can be measured by different concepts. Kline and McGrath (1998) think that five indicators in terms of work quality, work allocation, team attitude, problem solving capability and target compliance rate can be used to measure team performance. Team effectiveness, team viability, and team members' satisfaction on performance can be applied.

Many literatures indicate that task conflicts will raise team performance (Amason, 1996; Amason & Schweiger, 1994; Ancona & Caldwell, 1992; Hoffman & Maier, 1961; Jehn, 1994; Putnam, 1993; Tjosvold, 1986). When task conflicts show up, this situation would push team members to collect more information for understanding the reasons of problems, to have deep consideration on arguable viewpoints, to propose better solutions for facilitating communication in solving potential problems, to clarify misunderstandings, to exchange information, and to increase work recognition and understanding. These task conflicts would lead to better team performance. From above literature, process variables can influence teamwork performance which are such as communication efficiency, conflicts.

In additions, researchers find that greater task conflicts would reduce team members' satisfactions and recognition on team, and have lower team performance (Amason, 1996; Jehn, 1994 & 1995; Simons & Peterson, 2000). De Dreu and Weingart (2003) apply meta-analysis on team conflicts, they find that task conflicts have negative relationship with team performance.

Regarding national culture factors, individualism culture allows different viewpoint openness expression, and regards this kind of behavior will not endanger social relationship. In collectivism culture, people obey an order and emphasize harmony, regard task conflicts as violation and emotional provocation and unacceptable (Cai & Fink, 2002; Hui & Triandis, 1986; Nibler & Harris, 2003; Shenkar & Ronen, 1987). Nibler and Harris (2003) find American task conflicts have positive relationship with team effectiveness. Westwood et al. (1992) find Chinese in assigned task try to avoid confrontation, and emphasize maintaining harmony relationship. Consequently, it can be asserted that task conflicts and relationship conflicts have

significant influences on team performance.

Learning performance can be measured by the effectiveness of team interaction including individual learning effects and team learning effects. Individual learning effects can be performed in individual expected cognitive capability growth including assimilation and adjustment. Team learning performance can be observed by team members' interaction situation in terms of overall learning effect status. Potter and Balthazard (2002) have developed measures of process performance including solution acceptance, satisfaction, team commitment, and perceived efficiency to examine learning performance. Potter and Balthazard (2002) find that effective communication and knowledge sharing can raise team performance.

Team commitment and cohesiveness are popular separate research subjects. Cohesiveness is mutual willpower and power, which can gather team members together for paying their mental and physical efforts, and work forces for striving for reaching team targets (Festinger et al. 1950). Mikalachki (1969) indicates team cohesiveness has positive relationship with team members' social contact and friendship. Higher social contract and good friendship, higher team cohesiveness can be asserted from this research findings. Team commitment and cohesiveness still can be observed by the explanations of these variables' empirical findings, however.

When measuring teamwork effectiveness, literature indicates several concepts. Kline & McGrath (1998) and Hirst & Mann (2004) indicate team members must have tried their best in accomplishing tasks together. Tjosvold (1988) even thinks in executing team tasks, team member would try to help each other to solve out all the problems they face. Oldman & Cummings (1998) discuss important phenomenon of creativity in organizational context. Evans & Dion (1991) think a lot of creative good ideas been generated through teamwork when team members having good interaction. One way to measure teamwork performance is to measure team cohesion (Mullen & Copper, 1994). Harrison et al. (2002) have indicated that to accomplish teamwork tasks is very important, but must with team members' willing and positive feelings involving in teamwork cooperation. Self-satisfaction and accumulated learning experience are also very relevant to teamwork performance measurement (Beal et al., 2003). Regarding the concept of cohesiveness of team, Huang (2009) indicates that team members even become good friends to each other after completing the tasks together because of intensive interactions they become to know each other very well. Team has strong cohesion and team members become best friends that are relevant indicators of team cohesiveness. Above literature indicates that team performance can be measured by team cohesion as well.

Tett et al. (1991) have used a meta-analytic review and regarded personality measures as predictors of job performance. Safi'i, et al. (2021) have found that adversity quotient were

significant constructs affected on students' achievement, students' learning autonomy and student performance. The study of Safi'i opens a new paradigm for studying the adversity quotient and its implication for other educational aspects. Jung (2017) has paid attentions on the relation between adversity quotient and stress in university student. Aung and San (2020) have found that higher adversity quotient, the lower academic stress, and male students have higher academic stress than female students.

Teamwork performance can be influenced by team members' characteristics (Nieva, et al., 1978). Jewell and Reitz (1981) even indicate that teamwork performance can be influenced by team members characteristics such as capability, skills, knowledge, wisdom, personality. Four CORE dimensions (abilities) of adversity quotient are in terms of control, ownership, reach, and endurance (Stoltz, 1997), which together comprise an individual's AQ. Adaptability emotional intelligence comprises individual problem-solving capability (Bar-on, 1997). Therefore, it is reasonable to assume team members characteristics in terms of AQ and emotional intelligence (EQ) have significant influences on teamwork performance. So, it can be asserted that teamwork performance can be influenced by AQ and EQ variables. Therefore, this research has the following hypotheses:

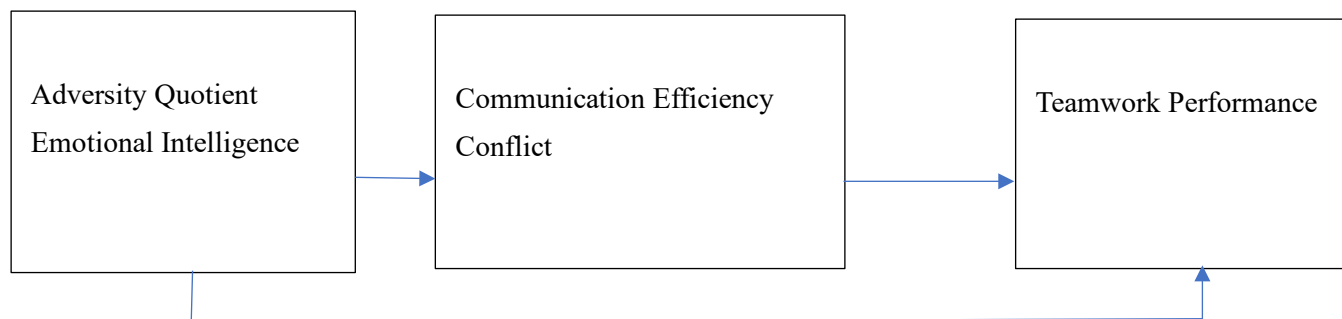
H7: Adversity quotient has significant influence on teamwork performance.

H8: Emotional intelligence has significant influence on teamwork performance.

3. RESEARCH METHODOLOGY

This section shows research framework, operational definition of variables, variable measurement, observation population and sample frame, and measuring methods.

3.1. Research Framework:



Research Hypotheses are summarized as below.

H1: Adversity quotient has significant influence on communication efficiency of teamwork.

H2: Adversity quotient has significant influence on conflict of teamwork.

H3: Emotional intelligence has significant influence on communication efficiency of teamwork.

H4: Emotional intelligence has significant influence on conflict of teamwork.

H5: Communication efficiency has significant influence on teamwork performance.

H6: Conflict has significant influence on teamwork performance.

H7: Adversity quotient has significant influence on teamwork performance.

H8: Emotional intelligence has significant influence on teamwork performance.

3.2. Operational Definition of Variables

Regarding adversity quotient, AQ is the sum of a series of control, ownership, reach, endurance abilities that affect people's perception of and response to a diverse series of hypothetical adverse events (Stoltz, 1997). Regarding emotional intelligence, EQ is the sum of a series of emotions, personality and interpersonal abilities that affect people's ability in problem solving to cope with the pressure of environmental needs (Bar-on, 1997). Regarding communication efficiency, communication atmosphere is full with honest and trust in the team, and team members can express own opinion clearly and information can be passed quickly and clearly. Team member can reach cohesion consensus in solving problems quickly (Thomas & Schmidt, 1976). Regarding conflict, conflict includes relationship conflicts and task conflicts (Jehn, 1994 & 1995). Regarding teamwork performance, team members have team cohesion; and have completed each assignment, generated creative good ideas, and satisfied with teamwork learning (Beal et al., 2003; Evans & Dion, 1991; Harrison et al., 2002; Hirst & Mann, 2004; Huang, 2009; Kline & McGrath, 1998; Mullen & Copper, 1994; Tjosvold, 1988).

3.3. Variable Measurement

3.3.1. Adversity Quotient

AQ is the sum of a series of indicators of control, ownership, reach, and endurance dimensions. Indicators of this research mainly follow the concepts of Stoltz (1997). There are twenty indicators as below: (1) I suffer a financial setback. To what extent can I influence this situation? (2) I am overlooked for a promotion. To what extent do I feel responsible for improving this situation? (3) I am criticized for a big project that I just completed. The consequences of this situation will affect? (4) I accidentally delete a very important email. The consequences of this situation will affect? (5) The high-priority project I am working on gets canceled. The consequences of this situation will affect? (6) Someone I respect ignores my attempt to discuss an important issue. To what extent do I feel responsible for improving this situation? (7) People respond unfavorably to my latest ideas. To what extent can I influence this situation? (8) I am unable to take much needed vacation. The consequences of this situation will affect? (9) I hit every red light on my way to an important appointment. The consequences of this situation will affect? (10) After extensive searching, I cannot find an important document. The consequences of this situation will affect? (11) My workplace is understaffed. To what extent do I feel

responsible for improving this situation? (12) I miss an important appointment. The consequences of this situation will affect? (13) My personal and work obligations are out of balance. To what extent can I influence this situation? (14) I never seem to have enough money. The consequences of this situation will affect? (15) I am not exercising regularly when I know I should be. To what extent can I influence this situation? (16) My team is not meeting its project goals. To what extent do I feel responsible for improving situation? (17) My computer crashed for the third time this week. To what extent can I influence this situation? (18) The meeting I am in is a total waste of time. To what extent do I feel responsible for improving this situation? (19) I lost something that is important to me. The consequences of this situation will affect? (20) The team leader adamantly disagrees with team members' decision. The consequences of this situation will affect? Indicators such as 1, 7, 13, 15, 17 are used to measure control dimension. Indicators such as 2, 6, 11, 16, 18 are used to measure ownership. Indicators 3, 5, 9, 12, 20 are used to measure reach. Indicators such as 4, 8, 10, 14, 19 are used to measure endurance.

3.3.2. *Emotional Intelligence*

Indicators of this research mainly follow the concepts of Bar-on (1997) on adaptability in problem solving particularly: my approach in overcoming difficulties is to move step by step, when faced with a difficult situation, I like to collect all the information about it that I can, I like to get an overview of a problem before trying to solve it, when facing a problem, the first thing I do is stop and think, when trying to solve a problem, I look at each possibility and then decide on the best way, and in handling situations that arise, I try to think of as many approaches as I can.

3.3.3. *Communication Efficiency*

Indicators of this research mainly adopt concepts of Thomas & Schmidt (1976): communication atmosphere is full with honest and trust in the team, team members can express own opinion clearly, information can be passed quickly and clearly in my team, team members can combine each other's information, idea and resources in completing the tasks, team members discuss questions together without personal stubborn, and team member can reach cohesion consensus in solving problems quickly.

3.3.4. *Conflict*

Indicators of this research mainly adopt concepts from Jehn (1994, 1995, 1997), and Jehn, et al. (2008): team members have tense relationship with each other, often get angry with each other, often have conflicts over different opinion, have language communication obstacle, have different opinion on the issue of meeting time and place, and often have argument on how to share work assignment.

3.3.5. *Teamwork Performance*

Team performance concept can be found in Kline & McGrath (1998) and Hirst & Mann (2004) such as team members have tried best in completing each assignment together. Team members have helped each other to solve out the problems (Tjosvold, 1988). Team members' interaction have generated creative good ideas (Evans & Dion, 1991). Team has strong cohesion (Mullen & Copper, 1994). The results are individual glad to participate teamwork and complete the tasks (Harrison et al., 2002) and very satisfied with teamwork learning (Beal et al., 2003), and some team members become best friends to each other (Huang, 2009).

3.4. Observation population and sample frame

Research target is mainly our Management College First-year students and students who have participated in Management related courses with teamwork experience. The reason to choose above courses because they need to complete teamwork tasks together. The purpose of this research is to understand what are the key factors in influencing students' teamwork performance. Sampling method is by asking students (i.e. target population) who have participated the Management related courses to answer the teamwork questionnaire by the end of June in academic year in 2024. Returned questionnaires are 342. After deducting 6 questionnaires with several missing values in the survey data, total valid sample questionnaire return is 336 students.

3.5. Measuring Methods

Quantitative research is used to address problems by providing correlations or revealing the link between research variables (Creswell, 2012). This study applies quantitative research method. Creswell (2012) defined quantitative research as "a sort of study that entails gathering numerical data and analyzing it using mathematically based approaches (in particular statistics) to explain phenomena." As a result, the research hypotheses in this study, which implies that all variables are positively associated, affected the decision to adopt a quantitative research approach. Quantitative research also assists in assessing the significance of relationships between variables. Because the research demands precise measurements, the quantitative technique is used for this investigation.

3.5.1. Questionnaire

Random sampling was designed based on a 5-point Likert Scale, with criterion 5=very high, 4=high, 3=normal, 2=low, 1=very low for measuring adversity quotient, with criterion 5=very often true of me , 4=often true of me , 3=sometimes true of me , 2=seldom true of me , 1=very seldom true of me for measuring emotional intelligence, and with criterion 5=strongly agree, 4=agree, 3= normal, 2=disagree, 1=strongly disagree for measuring the rest of variables

including communication efficiency, conflict, and teamwork performance. Respondents answer the given questions by marking the correct and suitable choice. The questionnaires include items to measure the different variables of the research model. The complete questionnaire includes the following: (1) adversity quotient using 20 items from Stoltz (1997); (2) emotional intelligence using 6 items from Bar-on (1997); (3) communication efficiency using 6 items revised from Thomas and Schmidt (1976); (4) conflict variable using 6 items from Jehn (1994, 1995, 1997) and Jehn, et al. (2008); (5) teamwork performance variable using 7 items concept from Beal et al. (2003), Evans & Dion (1991), Harrison et al. (2002), Hirst & Mann (2004), Huang (2009), Kline & McGrath (1998), Mullen & Copper (1994), and Tjosvold (1988).

3.5.2. Data collection Method

In this study, it adopted a quantitative method as a main resource. This study's data gathering method is a questionnaire survey, which is a method of collecting data in which the participant is given a series of questions with a written statement to answer. Questionnaires were designed on a Likert scale from 1 to 5. Moreover, for providing the convenience to the respondents whose mother language is not Chinese, and for improving the answering accuracy, the questionnaire was translated in English.

3.5.3. Data analysis methods:

In this study, data analysis was carried out in a quantitative method, and the questionnaire was used as a tool to collect research data. SPSS 25 statistical analysis software was used as tool for data analysis in the analysis process. Research hypotheses can be tested by the following analyses in terms of descriptive data analysis, reliability analysis, validity test, common bias test, factor analysis, Pearson correlation analysis, regression analysis, and canonical correlation analysis.

1. Descriptive Statistics Analysis:

Descriptive statistical analysis is used to organize, describe, and interpret data systematically. In this study, frequency distribution and estimated percentage are used for the personal attribute variables of the sample to understand the distribution of each variable.

2. Reliability Analysis:

The most popular method for determining internal consistency or reliability is Cronbach's alpha (Cronbach, 1951). It is frequently used to determine if a scale created by a survey's numerous Likert items is stable.

3. Validity Test:

Because this research adopts questionnaire survey, it is reasonable to know construct validity. Regarding construct validity test, exploratory factor analysis (Fabrigar, et al 1999) is applied to see questionnaire overall indicators' construct validity. KMO and Bartlett's test of sphericity

are applied to see the results of questionnaire construct validity.

4. Common Bias Test:

To ensure that there is no bias in the study, the common bias test is usually used to look at the data for both independent and dependent variables that are obtained from the same measurement context with the same item context and similar item qualities. This bias is investigated using the Harman's single factor.

5. Factor Analysis:

To reduce the dimensions of dependent variables, factor analysis is applied. And other reasons to apply exploratory factor analysis (Fabrigar, et al., 1999) are that scales are a collection of questions used to measure a particular research topic, there are no a priori hypotheses about factors or patterns of measured variables (Finch & West, 1997), this study observes the student objects which are different from previous observations on working level in the professional job fields, and this study has modified the adversity constructs which are more suitable and easier for observing students' teamwork process and output.

6. Pearson Correlation Analysis:

It is a test statistic for identifying the statistical relationship between two variables. It is regarded as the best tool for assessing the connection between variables of interest since it is based on the covariance approach. It can show the direction of the correlation and magnitude.

7. Regression Analysis:

When the research needs to measure one variable's value depending on another's value, regression analysis is used. The variable this research wishes to predict, or the result variables, is the dependent variable. This research estimates the value of additional variables, or predictor variables, using the independent variable.

8. Canonical Correlation Analysis:

This test is applied for testing the relationship between variables. The reasons to apply this analysis is because there are two sets of input variables and two set of process variables.

Therefore, this analysis can be applied to see sets of variables' relationships.

4. EMPIRICAL FINDINGS

This section shows the results of empirical findings including descriptive data analysis results, results of reliability test, results of validity test, results of common bias test, results of factor analysis, results of Pearson correlation analysis, Results of regression analysis, and results of canonical correlation analysis.

4.1. Descriptive Data Analysis Results

Table 4.1-Table 4.9 (see appendix) contain descriptive data analysis results of independent variables and dependent variables. Indicators of adversity quotient show the lowest mean value is 3.03 and the highest mean value is 3.92. Indicators of emotional intelligence show the lowest

mean value is 3.53 and the highest mean value is 4.19. Indicators of communication efficiency show that the lowest mean value is 3.85 and the highest mean value is 3.93. Indicators of conflict show that all of them have low mean value between 1.90 and 2.32. The result shows there is lower conflicts between team members. Indicators of teamwork performance show that the lowest mean value is 3.87 and the highest mean value is 4.14 that show students have higher teamwork performance. Sample contains 109 male and 227 female students. 155 students are age 19, 61 students are age 18, 50 students are age 20, and 48 students are age 21. The results of t-test show that there is no significance difference on AQ between male and female students. The results of Pearson correlation analysis on age and AQ show that there is no relationship between age and AQ.

4.2. Results of Reliability Test

Table 4.10 shows (see appendix) the reliability test results of each variable. Each variable has high Cronbach Alpha. The results show all variables' Cronbach's Alpha value greater than 0.8 that constructs have internal consistency and show all with high reliability. Adversity quotient Cronbach's Alpha is 0.809, emotional intelligence Cronbach's Alpha is 0.818, communication efficiency Cronbach's Alpha 0.915, conflicts Cronbach's Alpha 0.919, and teamwork performance Cronbach's Alpha is 0.911.

4.3. Results of Validity Test

Table 4.11 (see appendix) show that KMO value is 0.890 which indicates a good degree of common variance and shows questionnaire construct validity is good. Barlette test result yields a significance value ($p < 0.01$) less than point zero five, and shows that the variables are sufficiently interrelated and questionnaire has good construct validity.

4.4. Results of Common Bias Test

Table 4.12 (see appendix) shows the results of Common Bias Test. The result shows there is no bias. Harman's single factor is applied to see Common Method Bias Test. The results show that the Harman's first single factor is 30.083% which is lower than 40%. Therefore, this study has no bias.

4.5. Results of Factor Analysis

Results of factor analysis (see Appendix, Table 4.13) show that five factors are abstracted for adversity quotient profile. According to the characteristics of factors, this research gives the name of factors as below. ADV1 is Control & Ownership Factors. ADV2 is Unable Reach Factors. ADV3 is External Reach Factors. ADV4 is Endurance Factors. ADV5 is Mixed Factors.

4.6. Results of Pearson Correlation Analysis

Table 4.14 (see appendix) provide the results of Pearson correlation analysis among variables. The results indicate that some variables (EQ & Communication, EQ & Teamwork performance, Communication & Performance, ADV1 & Communication, ADV1 & Teamwork Performance, ADV2 & EQ, ADV2 & Conflict, ADV3 & Conflict, ADV5 & Communication) have positive relationships and some variables (EQ & Conflict, Conflict & Teamwork Performance, ADV1 & Conflict, ADV2 & Communication) have negative relationships.

4.7. Results of Regression Analysis

Table 4.15 – Table 4.18 (see appendix) shows the results of regression analysis on the relationship between independent variables and teamwork performance. The results indicate EQ has significant influences on communication and conflict. ADV1 & ADV2 have significant influences on communication, and ADV2 & ADV3 have significant influences on conflict. Communication and Conflict variables also have significant influences on Teamwork Performance. EQ, ADV1 and ADV2 have significant influences on Teamwork Performance. The results of Durbin-Watson statistics have all values close to 2 that show there is no autocorrelation detected in the sample, and all variables have independence.

4.8. Results of Canonical Correlation Analysis

Canonical Correlation Coefficients indicate the strength and direction of the relationship between the canonical variates in the two sets. Higher values suggest stronger associations. Significant Wilk statistics results suggest that canonical variates are significantly related. Table 4.19 (see appendix) show the results of canonical correlation analysis of the relationship between independent variables including adversity quotient and emotional intelligence, and communication efficiency, and conflict. The results of explaining power of independent variables' influences on process variables, however. The followings show independent and dependent canonical variates u_1 and u_2 , and v_1 and v_2 . EQ (Emotional Intelligence) apparently has highest influence at coefficient -0.634. ADV1 (control & ownership adversity factors) also has high influence at coefficient 0.636.

$u_1 = -.634 EQ_1 -.436 ADV_1 + .424 ADV_2 + .132 ADV_3 -.121 ADV_4 -.124 ADV_5$

$u_2 = -.426 EQ_1 + .636 ADV_1 + .511 ADV_2 + .574 ADV_3 -.164 ADV_4 + .462 ADV_5$

$v_1 = -.862 COM_1 + .241 CONF_1$

$v_2 = .742 COM_1 + 1.112 CONF_1$

4.9. Results of Hypotheses Testing

From the above multivariate analysis test results, the research hypotheses H1, H2, and H7 listed below have found partial empirical supports.

H1: Adversity quotient has significant influence on communication efficiency of teamwork.

H2: Adversity quotient has significant influence on conflict of teamwork.

H7: Adversity quotient has significant influence on teamwork performance.

In addition, H3, H4, H5, H6, and H8 listed below have found the empirical supports.

H3: Emotional Intelligence has significant influence on communication efficiency of teamwork.

H4: Emotional intelligence has significant influence on conflict of teamwork.

H5: Communication Efficiency has significant influence on teamwork performance.

H6: Conflict has significant influence on teamwork performance.

H8: Emotional intelligence has significant influence on teamwork performance.

5. CONCLUSION

This research focused on exploring students' characteristics in terms of adversity quotient (AQ) and emotional intelligence (EQ) involving in teamwork communication and conflict, and consequent performance. From empirical survey results, students show that a lot of them fall in the range of moderate AQ. This suggests that students probably fare well with many difficulties. Or when adversities mount, they may become fatigued. At times they may become demoralized or overwhelmed. As they undertake teamwork assignment and experience challenges in work and life, that can strengthen their adversity quotient, increase their academic knowledge, and upgrade their capabilities. And then they will discover newfound strength and fortitude in dealing with all sorts of challenges. The opportunity to participate teamwork tasks for improving AQ and EQ may become a transformational experience as students discover a large pool of untapped potential and enjoyment.

The empirical results show that there is no significance difference on AQ between male and female students. This result is the same as Bantang et al. (2013) and Huijuan's (2009) observations on that gender has no significant influence on the level of individual's AQ. This result confirms the thinking of Somaratne, et al. (2019) on that AQ is a mental capacity which extends beyond the masculine and feminine traits of people. The empirical results show that age and AQ show have no relationship between them. This finding is the same as Huijuan's (2009) findings that age has no significant influence on AQ. Maybe the reason is that students are too young with less experience to distinguish their difference between age and AQ, and between sex and AQ.

This empirical research discovers the significant influences of emotional intelligence on communication efficiency and conflicts, and on teamwork performance. Apparently, input-process-output model can well explain teamwork performance. According to McGrath's input-process-output model (Gladstein, 1984; Horwitz, et al., 2006; Jewell and Reitz, 1981; and

Schwarz, 1994), input variables such as emotional intelligence, and process variables such as communication efficiency and conflict, all have empirical supports of their significant influences on teamwork performance in this research. This research also discovers adversity quotient have significant partial influences on communication efficiency, conflict, and teamwork performance. Control & ownership factors and unable reach factors have significant influences on communication and teamwork performance. Unable reach factors and external reach factors have significant influences on conflict.

This empirical research has found the followings. When adversity in control and ownership is high, communication efficiency is high. When emotional intelligence in problem solving is high, communication efficiency is high. When adversity in unable reach is low, communication efficiency is high. When emotional intelligence in problem solving is low, conflict is high. When unable reach factors and external reach factor are high, conflict is high. When communication efficiency is high, teamwork performance is high. When conflict is low, teamwork performance is high. When emotional intelligence in problem solving is high, teamwork performance is high. When adversity in unable reach factor is low, teamwork performance is high. When adversity in control and ownership factors are high, teamwork performance is high.

Communication is one of importance process factors in influencing teamwork performance (Gladstein, 1984; Jao, 1997; Jewell and Reitz, 1981; Horwitz, et al., 2006; Schwarz, 1994; and Thomas and Schmidt, 1976). This empirical study on students' teamwork performance also supports the above viewpoint. Past research (Jehn, 1994, 1995) has regarded relationship conflicts and task conflicts as process variables in influencing team performance. This empirical research also has found students' teamwork has lower conflicts among team members. This research finds lower conflicts between team members, so the result is with better output in teamwork performance.

Student team members all recognize the importance of teamwork value and performance. Students might perceive that teamwork could meet their need of self-esteem, and by their own personal efforts devoted deeply in team work involvement. This research finds that students have been involving in their team work highly, and have good performance output. With good adversity quotient and emotional intelligence, students can easily overcome difficulties occurring in the process of communication and reduce the conflicts between them when they need to cooperate with team members to complete the teamwork task together. When communication efficiency is high and conflict is low, their teamwork cohesion can become very high. And through good cooperation, they can learn from each other and increase their knowledge and capabilities, teamwork provides them opportunities to know each other and to

become best friends. When teamwork shows high cohesiveness among team members, teamwork performance can be high (Beal et al. 2003). Apparently, team members with high AQ and emotional intelligence can achieve great success, both for themselves and for their team. By focusing on developing AQ and emotional intelligence ability, teamwork can become more efficiency and team members can help their team to achieve their full potential.

This empirical research supports the viewpoint that with good adversity quotient and emotional intelligence can lead the students to solve out problem easily and do better decision making, and they would have better teamwork performance. Team cohesion and satisfaction of learning is applied to measure the effectiveness of team interaction in this research. Teamwork performance can be measured by team members' interaction situation in terms of overall cohesiveness effect status. Consequently, this research has successfully in measuring teamwork performance by using cohesion related concept. The empirical results show that our Management College students' teamwork have high performance, however.

This research suggests that university can improve students' adversity quotient and emotional intelligence. With higher level of adversity quotient and emotional intelligence students might feel at ease, coherent, and in control over own emotions as well as those of others. This gives them a sense of calm and psychological comfort, which will enhance their mental health and motivate them to do better in school. By offering guidance and providing instruction through courses, activities, or other means, educational institutions can encourage students to express their actual emotions and increase their adversity quotient profile and emotional intelligence. For instance, to improve students' AQ, first, try to increase their self-awareness by asking them to take time to reflect on their emotions and to see how the effect their interactions with others. Second, try to improve students AQ by making efforts to listen actively to others and to understand their perspective. Third, try to improve students' AQ by working on developing their ability to manage their emotions and to control their responses in difficult situations. Fourth, try to improve their AQ by focusing on developing their ability to inspire and motivate others. Fifth, try to improve their AQ by working on developing their interpersonal skills and their ability to connect with others. To improve students' emotional intelligence in adaptability, university can provide students with many opportunities involving in brain storming tasks, case studies in problem solving scenarios, field surveys, business visiting tours, etc.

Many dimensions can affect students' teamwork outcomes. Using intelligence quotients can help people build a dynamic team if they simply look at all the quotients (such as emotional quotient, adversity quotient, social quotient, and cognitive quotient) simultaneously vs. intelligence quotient independently. One limitation of this research is that the number of respondents in the sample was limited to 336 students. Other researchers can examine a larger

sample or conduct research on other university's students. Also, there are different challenges that Taiwanese students and international students face according to their original growing background. For example, the language issues during the class, learning method, the motivations of their learning. Therefore, future research can add more variables such as motivations of students, institution's role and supports, to observe their influences on students.

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7. APPENDIX

Table 4.1. Descriptive Data Analysis Results of Adversity Quotient Profile

	Mean	SD	N
1 suffer a financial setback	3.27	.952	329
2 overlooked & feel responsible	3.43	.864	329
3 being criticized for project	3.43	1.066	329
4 accidentally delete email been affected	3.57	1.151	329
5 project been canceled	3.80	.989	329
6 project been canceled	3.60	.916	329
7 people respond unfavorable to my idea	3.03	.925	329
8 unable to take vacation	3.33	1.000	329
9 hit red light on the way to appointment	3.61	1.025	329

10 after searching cannot find document	3.57	.983	329
11 feel responsible for understaffed	3.55	.916	329
12 miss important appointment	3.29	1.005	329
13 work obligations out of balance	3.16	.863	329
14 no enough money	3.24	1.044	329
15 not exercising regularly	3.41	.896	329
16 not meeting project goals	3.53	.897	329
17 computer crashed	3.03	1.154	329
18 meeting waste of time	3.46	1.000	329
19 lost something important	3.92	.991	329
20 leader disagree members' decision	3.39	.880	329

Table 4.2. Descriptive Data Analysis Results of Emotional Intelligence

	Mean	SD	N
1 overcoming difficulties step by step	3.53	1.002	335
2 collect information in difficult situation	3.96	.805	335
3 overview a problem before solving	4.19	.786	335
4 stop & think when facing problem	4.03	.820	335
5 look possibility to solve problem	4.00	.865	335
6 think of many approach	4.10	.798	335

Table 4.3. Descriptive Data Analysis Results of Communication Efficiency

	Mean	SD	N
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1 atmosphere full with honest & trust	3.91	.915	336
2 express opinion clearly	3.93	.910	336
3 information passed quickly & clearly	3.85	.957	336
4 combine information, idea & resources	3.89	.889	336
5 discuss questions together	3.95	.962	336
6 reach cohesion solving problem quickly	3.93	.918	336

Table 4.4. Descriptive Data Analysis Results of Conflicts

	Mean	SD	N
1 tense relationship	2.05	1.033	334
2 angry with each other	1.96	1.113	334
3 conflicts over different opinion	2.01	1.100	334
4 language communication problem	1.90	1.108	334
5 different opinion on meeting time & place	2.16	1.123	334
6 argument on how to share work assignment	2.32	1.169	334

Table 4.5. Descriptive Data Analysis Results of Teamwork Performance

	Mean	SD	N
1 try best in completing assignment	4.14	.826	335
2 help each other to solve out problem	4.14	.811	335
3 generated creative ideas	4.06	.865	335
4 strong cohesion	3.87	.956	335
5 glad to participate teamwork	4.03	.920	335

6 satisfied with teamwork learning	4.06	.910	335
7 team members become best friends	3.91	1.065	335

Table 4.6. Sample Distribution Based on Sex

	frequency	%	Valid %	Accumulative %
male	109	32.4	32.4	32.4
female	227	67.6	67.6	100.0
Total	336	100.0	100.0	

Table 4.7. Results of T-Test

Group Statistics

	sex	N	Mean	SD	Std. Error Mean
Totaladv	male	103	136.1359	21.18872	2.08779
	female	226	137.6726	16.69541	1.11056

Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means		
		F	Sig.	t	DF	Sig. (two tails)
Totaladv	Equal variances assumed	2.742	.099	-.710	327	.478
	Equal variances not assumed			-.650	162.009	.517

Table 4.8. Sample Distribution Based on Age

Age	frequency	%	Valid %	Accumulative %
18	61	18.2	18.3	18.3
19	155	46.1	46.4	64.7
20	50	14.9	15.0	79.6
21	48	14.3	14.4	94.0

22	5	1.5	1.5	95.5
23	8	2.4	2.4	97.9
24	2	.6	.6	98.5
26	1	.3	.3	98.8
29	2	.6	.6	99.4
31	1	.3	.3	99.7
32	1	.3	.3	100.0
Total	334	99.4	100.0	
missin value	2	.6		
g				
Total	336	100.0		

Table 4.9. Results of Pearson Correlation between Age and Adversity Quotient

Correlation

		age	Totaladv
age	Pearson correlation	1	-.075
	Sig. (two tails)		.176
	N	334	327
Totaladv	Pearson correlation	-.075	1
	Sig. (two tails)	.176	
	N	327	329

Table 4.10. Reliability Test Results

Variables	Cronbach Alpha
Adversity Quotient Profile	.809
Emotional Intelligence	.818
Communication Efficiency	.915
Conflicts	.919
Teamwork Performance	.911

Table 4.11. Results of Validity Test

KMO & Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.890
Bartlett's Test of Approx. Chi-Square	7853.463
Sphericity df	990
Sig.	.000

Table 4.12. Results of Common Bias Test - Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Toal	% of Variance	Cumulativ e %
	1	2.707	30.083	30.083	2.707	30.083
2	1.288	14.307	44.390	1.288	14.307	44.390
3	1.033	11.473	55.863	1.033	11.473	55.863
4	1.008	11.195	67.058	1.008	11.195	67.058
5	.985	10.949	78.007			
6	.793	8.809	86.816			
7	.549	6.097	92.913			
8	.413	4.586	97.499			
9	.225	2.501	100.000			

Extraction Method : Principal Component Analysis

Table 4.13. Results of Factor Analysis

	Factor Loadings				
	1	2	3	4	5
16 not meeting project goals	.722	.082	.031	.011	.148
11 feel responsible for understaffed	.721	.047	.117	.115	.097
2 overlooked & feel responsible	.673	.006	.066	.257	-.026
18 meeting waste of time	.668	.082	.125	-.117	.150
1 suffer a financial setback	.560	-.059	-.079	.355	-.269
13 work obligations out of balance	.531	.152	-.055	.107	.267
15 not exercising regularly	.528	.284	-.011	-.012	.095
6 project been canceled	.506	.186	.388	-.138	.074
9 hit red light on the way to appointment	.037	.737	.080	.284	-.057
8 unable to take vacation	.162	.729	.021	.103	.087

20 leader disagree members' decision	.221	.526	.237	-.041	.192
5 project been canceled	.099	.125	.759	.139	-.089
3 being criticized for project	-.113	-.033	.644	.192	.250
7 people respond unfavorable to my idea	.187	.317	.559	-.195	.035
10 after searching cannot find document	.066	.422	.018	.631	.053
19 lost something important	.080	.232	.093	.580	.203
4 accidentally delete email been affected	.119	-.132	.506	.538	.007
17 computer crashed	.270	-.036	.041	-.054	.709
14 no enough money	.012	.325	.042	.105	.618
12 miss important appointment	.189	-.028	.092	.374	.544
eigenvalue	4.554	1.914	1.403	1.253	1.206
Cronbach's alpha	0.773	0.607	0.535	0.508	0.503
% of Variance	22.770	9.568	7.015	6.265	6.029
Cumulative %	22.770	32.339	39.354	45.619	51.649

Note: Extraction Method : Main Principal Component Analysis.

Rotation Method : Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Name of Factors: ADV1: Control & Ownership Factors, ADV2: Unable Reach Factors, ADV3:

External Reach Factors, ADV4: Endurance Factors, ADV5: Mixed Factors

Table 4.14. Results of Pearson Correlation Analysis between Variables

		ADV1	ADV2	ADV3	ADV4	ADV5	EQ1	COM1	CONF1	F
ADV1	Pearson Correlation	1	.000	.000	.000	.000	.469**	.348**	-.114*	
	Significance (two tails)		1.000	1.000	1.000	1.000	.000	.000	.040	
	N	329	329	329	329	329	328	329	327	
ADV2	Pearson Correlation	.000	1	.000	.000	.000	.149**	-.118*	.195**	
	Significance (two tails)	1.000		1.000	1.000	1.000	.007	.032	.000	
	N	329	329	329	329	329	328	329	327	
ADV3	Pearson Correlation	.000	.000	1	.000	.000	.106	.011	.141*	
	Significance (two tails)	1.000	1.000		1.000	1.000	.056	.838	.011	

N		329	329	329	329	329	328	329	327
ADV4	Pearson Correlation	.000	.000	.000	1	.000	.003	.050	-.062
	Significance (two tails)	1.000	1.000	1.000		1.000	.950	.370	.263
N		329	329	329	329	329	328	329	327
ADV5	Pearson Correlation	.000	.000	.000	.000	1	.110*	.110*	.039
	Significance (two tails)	1.000	1.000	1.000	1.000		.047	.046	.484
N		329	329	329	329	329	328	329	327
EQ1	Pearson Correlation	.469**	.149**	.106	.003	.110*	1	.352**	-.214**
	Significance (two tails)	.000	.007	.056	.950	.047		.000	.000
N		328	328	328	328	328	335	335	333
COM1	Pearson Correlation	.348**	-.118*	.011	.050	.110*	.352**	1	-.468**
	Significance (two tails)	.000	.032	.838	.370	.046	.000		.000
N		329	329	329	329	329	335	336	334
CONF1	Pearson Correlation	-.114*	.195**	.141*	-.062	.039	-.214**	-.468**	1
	Significance (two tails)	.040	.000	.011	.263	.484	.000	.000	
N		327	327	327	327	327	333	334	334
PERM1	Pearson Correlation	.408**	-.103	.040	.006	.065	.464**	.749**	-.464**
	Significance (two tails)	.000	.061	.466	.915	.242	.000	.000	.000
N		328	328	328	328	328	334	335	333

** Significance at 0.01 level (two tails) .

* Significance at 0.05 level (two tails) .

Table 4.15 Results of Regression Analysis between Input and Communication Variables

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.442 ^a	.196	.181	.90173749	1.736

a. Predictors : (Constant) , ADV5, ADV2, ADV3, ADV1, ADV4, EQ1

b. Dependent Variable: COM1

ANOVA^a

Model	Sum of Square	df	Mean Square	F	Sig.
1 Regression	63.498	6	10.583	13.015	.000 ^b

Residual	261.015	321	.813		
Total	324.513	327			

a. Dependent Variable: COM1

b. Predictors : (Constant) , ADV5, ADV2, ADV3, ADV1, ADV4, EQ1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std Error	β		
1	(Constant)	-.013	.050		-.262	.794
	EQ1	.254	.058	.255	4.374	.000
	ADV1	.226	.057	.227	3.972	.000
	ADV2	-.156	.051	-.157	-3.090	.002
	ADV3	-.018	.050	-.018	-.354	.723
	ADV4	.043	.050	.043	.868	.386
	ADV5	.080	.050	.080	1.584	.114

a. Dependent Variable: COM1

Table 4.16. Results of Regression Analysis between Input and Conflict Variables

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.368 ^a	.135	.119	.92732286	1.686

a. Predictors : (Constant) , ADV5, ADV3, ADV2, ADV4, ADV1, EQ1

b. Dependent Variable: CONF1

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.930	6	7.155	8.320	.000 ^b

Residual	274.317	319	.860		
Total	317.247	325			

a. Dependent Variable: CONF1

b. Predictors : (Constant) , ADV5, ADV3, ADV2, ADV4, ADV1, EQ1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	β		
1	(Constant)	-.010	.051		-.195	.845
	EQ1	-.276	.060	-.281	-4.604	.000
	ADV1	.012	.059	.012	.199	.842
	ADV2	.234	.052	.237	4.488	.000
	ADV3	.163	.052	.165	3.154	.002
	ADV4	-.071	.051	-.072	-1.378	.169
	ADV5	.065	.052	.066	1.248	.213

a. Dependent Variable: CONF1

Table 4.17. Results of Regression Analysis between Process and Teamwork Performance Variables

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.762 ^a	.581	.579	.65060921	1.804

a. Predictors : (Constant) , CONF1, COM1

b. Dependent Variable: PERM1

ANOVA^a

Model	Sum of Square	df	Mean Square	F	Sig.
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1	Regression	193.756	2	96.878	228.867	.000 ^b
	Residual	139.686	330	.423		
	Total	333.442	332			

a. Dependent Variable: PERM1

b. Predictors : (Constant) , CONF1, COM1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	β		
1	(Constant)	-.005	.036		-.137	.891
	COM1	.685	.040	.685	16.976	.000
	CONF1	-.142	.040	-.141	-3.504	.001

a. Dependent Variable: PERM1

Table 4.18. Results of Regression Analysis between Input Variables and Teamwork Performance

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.531 ^a	.282	.269	.85670543	1.659

a. Predictors : (Constant) , ADV5, ADV2, ADV1, ADV3, ADV4, EQ1

b. Dependent Variable: PERM1

ANOVA^a

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	92.302	6	15.384	20.960	.000 ^b

Residual	234.862	320	.734		
Total	327.164	326			

a. Dependent Variable: PERM1

b. Predictors : (Constant) , ADV5, ADV2, ADV1, ADV3, ADV4, EQ1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	β		
1	(Constant)	-.001	.047		-.020	.984
	EQ1	.372	.055	.373	6.721	.000
	ADV1	.230	.054	.229	4.223	.000
	ADV2	-.158	.048	-.158	-3.276	.001
	ADV3	-.001	.048	-.001	-.018	.985
	ADV4	-1.409E-5	.048	.000	.000	1.000
	ADV5	.022	.048	.022	.453	.651

a. Dependent Variable: PERM1

Table 4.19. Results of Canonical Correlation Analysis between Input Variables and Process Variables

	Correlation	Eigenvalue	Wilks Statistic	F	Num D.F.	Denom D.F.	Sig.
1	.451	.256	.729	9.077	12.000	636.000	.000
2	.291	.093	.915	5.907	5.000	319.000	.000

H0 for Wilks test is that the correlations in the current and following rows are zero.

Set 1 Standardized Canonical Correlation Coefficients

Variable	1	2

EQ1	-.634	-.426
ADV1	-.436	.636
ADV2	.424	.511
ADV3	.132	.574
ADV4	-.121	-.164
ADV5	-.124	.462

**Set 2 Standardized Canonical
Correlation Coefficients**

Variable	1	2
COM1	-.862	.742
CONF1	.241	1.112

Set 1 Canonical Loadings

Variable	1	2
EQ1	-.776	.063
ADV1	-.735	.433
ADV2	.330	.443
ADV3	.065	.535
ADV4	-.122	-.176
ADV5	-.193	.409

Set 2 Canonical Loadings

Variable	1	2
COM1	-.977	.212
CONF1	.652	.758

Set 1 Cross Loadings

Variable	1	2
EQ1	-.350	.018
ADV1	-.332	.126
ADV2	.149	.129
ADV3	.029	.156
ADV4	-.055	-.051
ADV5	-.087	.119

Set 2 Cross Loadings

Variable	1	2
COM1	-.441	.062
CONF1	.294	.221

Proportion of Variance Explained

Canonical Variable	Set 1 by Self	Set 1 by Set 2	Set 2 by Self	Set 2 by Set 1
1	.218	.044	.690	.141
2	.145	.012	.310	.026

MS0027: Business Model Design and Development of Mah Boonkrong Rice Brand on Online Channel

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Business Model Design and Development of Mah Boonkrong Rice Brand on Online Channel

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Extended Abstract

This study examines the soft problems faced by the Mah Boonkrong Rice brand in its transition to the Thai e-commerce market, a challenge common to FMCG companies. Issues include high shipping costs, logistical difficulties, competition from platforms like Shopee and Lazada, and balancing traditional and digital sales channels. Additionally, significant platform fees and low brand recognition among younger consumers were identified. Using the Soft Systems Methodology (SSM), the study engaged stakeholders, created visual models, and defined objectives to address these challenges. Key solutions involved optimizing logistics, enhancing digital marketing, and integrating sales channels. The Mah Boonkrong Rice brand developed strategic actions, including digital marketing campaigns, platform utilization, logistics optimization, and CRM programs. By implementing these strategies, the brand aims to leverage traditional strengths and capitalize on new digital opportunities for sustainable growth.

Keywords: Soft Systems Methodology (SSM), Soft Problem, Digital Transformation, FMCG, Mah Boonkrong Rice

1. Introduction

The rapid growth of e-commerce within the Fast-Moving Consumer Goods (FMCG) sector has prompted many traditional companies to transition from brick-and-mortar outlets to online platforms. The Mah Boonkroong Rice brand, managed by Patum Rice Mill and Granary Public Company Limited (PRG), seeks to expand its market presence by developing an effective online business model. However, this transition presents significant challenges, including high shipping costs, logistical difficulties, competition from established online platforms like Shopee and Lazada, and the need to balance traditional and digital sales channels. This study aims to address these issues using the Soft Systems Methodology (SSM) to design a comprehensive business model for the online channel.

2. Literature and Framework

2.1. Factors and Barriers to Transition to E-commerce

Amornkitvikai, Buachoom, Harvie, and Tham (2022) explored the factors and barriers affecting Thai Micro-, Small-, and Medium-Sized Enterprises (MSMEs) in sustainable e-commerce. The study covered various MSME products and services, including handicrafts, food and beverages, fashion, beauty, home decor, agricultural products, tourism, wellness, and educational services. Key barriers identified include technological challenges in adopting e-commerce, regulatory and infrastructural constraints, market dynamics, resource limitations, and strategic approaches for overcoming these issues. Understanding these challenges is vital for stakeholders to develop supportive strategies.

Additionally, Camus (2023) highlighted that last-mile delivery, comprising up to 30% of e-commerce costs, poses a significant barrier for FMCG companies, necessitating strategies for cost reduction, delivery time optimization, and enhanced customer satisfaction in Thailand.

2.2. Soft Problem Introduction

The concept of "soft problems" helps understand business challenges that are not easily defined or resolved with straightforward solutions (Checkland & Poulter, 2007). For example, Aminnaseri and Taleghani (2023) improved sustainable supply chain performance by identifying financial components and addressing unstructured problems through stakeholder analysis to propose cost-effective sustainable practices and prioritize investments. Gorlova, Kuzmin, Nikitina, Strielkowski and Suvorova (2023) discussed using soft problems to enhance organizational economic sustainability via process optimization and effective human capital management. Badie, Hanafizadeh, Mehrabioum, and Soofi (2017) highlighted components of soft problems in business model design, including problematic situations, conflicting worldviews, activity systems, purposeful holons, inquiry processes, and structured discussions for improvement. This approach focuses on understanding problem situations to develop solutions, emphasizing systems thinking and stakeholder engagement.

2.3. The Soft System Methodology Introduction

To resolve soft problem, the Soft System Methodology can be used to address complexities in a variety of contexts as same as Hanafizadeh and Mehrabioum (2019) used for developing a mobile banking business model by using the perspective of soft problem defined the root cause of an unstructured problem and applied a new framework based on the Soft Systems Methodology with consisting of 4 different activities as (1) finding-out, (2) Modelling, (3) Debate and Discussion, and (4) Defining/Taking Actions to applied this model to one of the Iranian private banks to develop mobile baking business model.

2.4. Conceptual Framework

Regarding review of literatures, this paper aims to find the factors and barriers that FMCG businesses may encounter from study of Amornkitvikai, Buachoom, Harvie, & Tham (2022) and Camus (2023) from the perspective of soft problem.

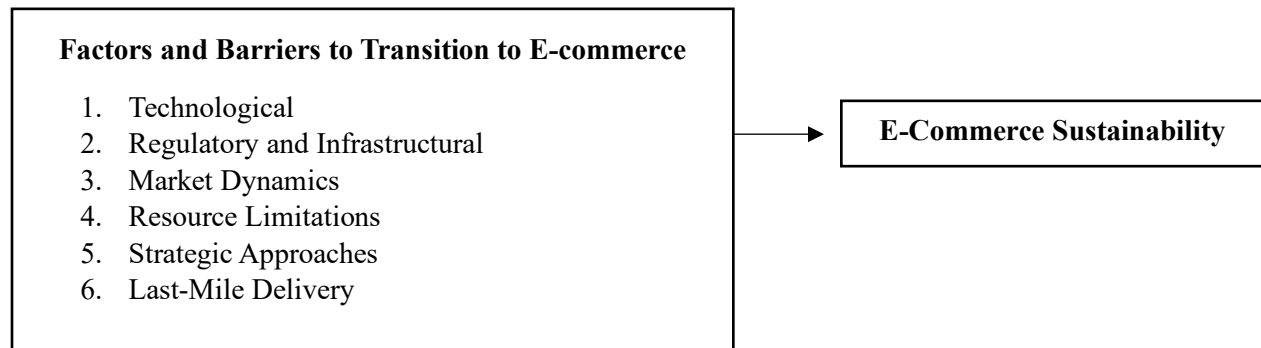


Figure 1: The Conceptual Framework of Business Model Design and Development of Mah Boonkrong Rice Brand

The figure shows the process of transitioning from offline to online channels, the first step being the identification of factors and barriers that lead to unsuccessful transition. These factors and barriers are then defined by using the perspective of soft problem concept. on Online Channel.

3. Methodology

For this research, the sample includes top management level of Patum Rice Mill and Granary Public Company Limited, involved in selling the Mah Boonkrong rice brand online. They come from Management, Modern Trade Sales, and Modern Trade Marketing departments. Interview questionnaires are based on soft problems, to identify factors and barriers to successful online transition across 6 perspectives: Technological, Regulatory and Infrastructural, Market Dynamics, Resource Limitations, Strategic Approaches, and Last-Mile Delivery.

The Soft Systems Methodology (SSM) will be used, focusing on understanding challenges, stakeholder perspectives, supporting actions, and solutions. The data will be integrated into SSM's adapted 2-phase, 10-step process to identify problems and build a business model and lastly the model will be validated with stakeholders using triangulation to ensure reliability and implement ability.

4. Result

The interview results show that Mah Boonkrong Rice brand faces typical FMCG challenges in transitioning to e-commerce, such as high shipping costs, logistical difficulties, intense competition, and balancing traditional and digital sales channels. Fees from platforms like Shopee and Lazada impact profitability, and the brand struggles with low awareness among younger generations, needing targeted marketing efforts. Stakeholders have diverse perspectives: top management explores digital strategies while managing costs, marketing faces high promotional costs, and sales handles logistics. Customers still prefer traditional purchasing methods. Planned actions include digital marketing campaigns, expanding platform use, optimizing logistics, integrating sales channels, and implementing CRM programs.

Key tasks involve market research, cost management, technology integration, brand campaigns, and strategic partnerships. Overcoming barriers requires stakeholder engagement, learning from successful transitions, pilot projects, strategy improvement, and training. Addressing these issues with cost-benefit analyses, consumer education, incentives, collaboration, and a robust feedback mechanism will help Mah Boonkrong Rice brand navigate e-commerce complexities and leverage new digital opportunities for growth.

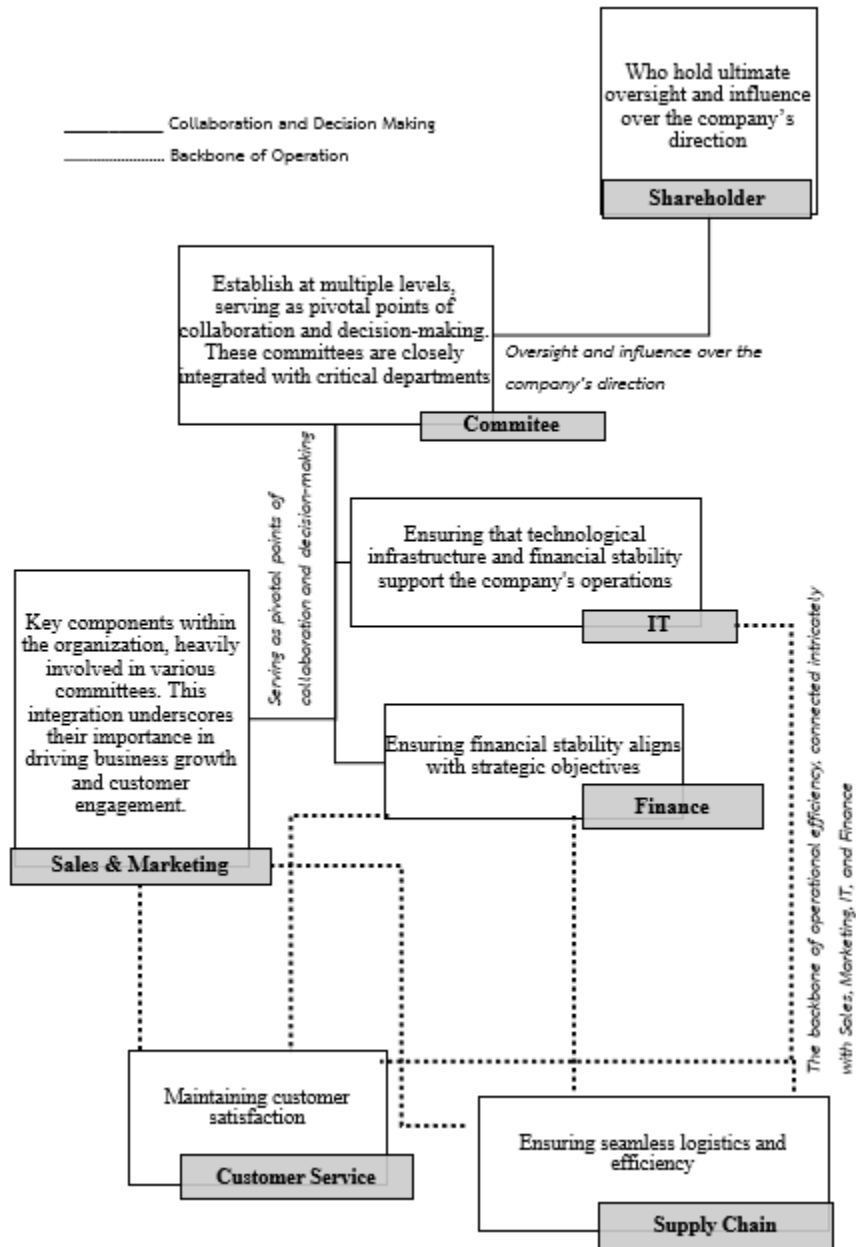


Figure 2: The Organizational Structure Model

Following the identification of key issues and building modelling, this paper conducts an in-depth triangulation review with the shareholders of the Mah Boonkroong Rice brand. The goal of this review is to comprehensively assess business pain points, organizational models, and activities, and to establish objectives and key performance indicators essential for a successful transformation to e-commerce.

The shareholders collectively identified and agreed upon the significant pain points and barriers associated with online selling. They provided a strategic prioritization to address these issues, as follows:

High Priority: The immediate focus is on reducing delivery costs by partnering with third-party logistics providers. Simultaneously, it is crucial to educate and train internal staff to enhance their knowledge and competencies in e-commerce operations.

Medium Priority: The next step involves the development of a seamless internal infrastructure. Despite the high investment required, this is necessary to support the transition and ensure efficient operations.

Low Priority: Once the tasks are addressed, the final step is to formulate comprehensive strategies. These strategies should be aligned with the internal capacity and capabilities of the organization, ensuring they are realistic and achievable.

This structured approach is designed to ensure a seamless transition to e-commerce, addressing key challenges in a prioritized manner and laying the foundation for sustainable growth and success in the digital marketplace

5. Discussion

The study identified challenges for Mah Boonkrong Rice brand in the Thai e-commerce market, typical of FMCG companies. These include high shipping costs, logistical issues, intense competition, and balancing traditional and digital sales channels, with fees from platforms like Shopee and Lazada affecting profitability. The brand also struggles with low awareness among younger consumers, needing targeted marketing. Stakeholders have varied perspectives: top management explores digital strategies while managing costs, the marketing department faces high promotional costs, and sales handle logistics. Planned actions include digital marketing campaigns, expanding platform use, optimizing logistics, integrating sales channels, and implementing CRM programs. Overcoming barriers involves stakeholder engagement, learning from successful transitions, pilot projects, strategy improvement, and training. The Soft Systems

Methodology (SSM) was applied to address these issues, identifying market research, cost management, technology integration, brand campaigns, and strategic partnerships as key actions. Shareholders prioritized reducing delivery costs, developing infrastructure, and formulating strategies. The organizational structure includes roles within Sales, Marketing, IT, Finance, Customer Service, and Supply Chain, each with KPIs to measure success, ensuring continuous improvement and strategic alignment for sustainable growth in e-commerce.

6. Reference

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MS0028: Barriers in Sustainable Fashion Consumption: Comparing Generation Y (Millennials) and Generation Z

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Barriers in Sustainable Fashion Consumption: Comparing Generation Y (Millennials) and Generation Z

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Extended Abstract

The environmental impact of fast fashion has led consumers to seek sustainable fashion. Despite positive motivations, an attitude-behavior gap persists. This study investigates barriers as high prices, low availability, and lack of trust affecting sustainable fashion consumption among Generation Y and Z. Data from 234 participants show that for Generation Y, motivation strongly influences sustainable fashion consumption intention, the barrier of high price moderates this relationship. For Generation Z, high prices and lack of trust directly and negatively affect intention. The study clarifies motivations influencing sustainable fashion consumption, aiming to reduce the gap between motivations and actual purchasing intentions.

Keyword: Attitude-behavior gap, Motivation toward sustainable fashion consumption, High price, Low availability, Lack of trust in sustainability claim

1. Introduction

The fashion industry, the third-largest globally, generates approximately 92 million tons of textile waste annually, potentially rising to 134 million tons by 2030 (Chen et al., 2021). Fast fashion contributes to 10% of global carbon emissions and 20% of wastewater, with a single cotton T-shirt

consuming up to 2,700 liters of water (Hossain, 2019). Additionally, consumers are concerned about labor welfare. Fast fashion's rapid trend cycles promote disposable behavior. Despite growing awareness of environmental impacts, a gap exists between sustainable fashion motivations and purchasing behaviors. Barriers include high costs, limited availability, and skepticism about sustainability claims. The customers in Generation Y (Millennials generation) and Generation Z are considered to be the next customer groups to be concerned about a climate-safe environment (Vermeir & Verbeke, 2006). Each generation has some different characteristics. Therefore, this study aims to understand the barriers of the attitude-behaviors gap toward sustainable consumption, comparing Generation Y (Millennials generation) and Generation Z.

2. Literature and framework

2.1 Motivation Toward Sustainable Fashion Consumption

Motivation drives consumer behavior through internal or external factors like beliefs, perceptions, values, interests, needs, goals, and actions. In sustainable fashion, key motivations include reducing consumption, expressing self-image, addressing environmental concerns, and increasing social consciousness. Consumers are motivated by cost, quality, and durability tend to buy high-quality products less frequently. They seek clothing that reflects their identity and values, preferring eco-friendly materials and fair labor practices. Social concerns also drive support for fair working conditions in the fashion industry (Lundblad and Davies, 2016).

2.2 The Attitude-Behavior Gap

Despite increased awareness of environmental and social issues, a gap exists between attitudes and actual purchases of sustainable fashion (Niinimäki et al., 2020). Barriers such as habits, lifestyle, ethics, convenience, beliefs, and economic costs hinder the translation of motivations into actions. High prices also obstruct sustainable fashion adoption (Nguyen et al., 2019). Effective communication strategies are essential for brands to convey ethical and sustainable attributes to consumers, especially in Generations Y and Z (Cherradi and Tetik, 2020).

2.3 Barriers: 1. High Price of Sustainable Fashion: High prices are a key barrier to sustainable consumption (Chang, 2011). Sustainable products are often more expensive, making them less accessible for budget-conscious consumers. 2. Low Availability of Sustainable Fashion: Limited availability of sustainable fashion items obstructs eco-friendly purchases. Consumers struggle to find sustainable options, especially in certain categories, driving them to mainstream stores (Moon et al., 2015). 3. Lack of Trust in Sustainability Claims: Trust issues, particularly related to greenwashing, hinder sustainable fashion consumption. Consumers often doubt the authenticity of eco-friendly claims, leading to skepticism and hesitation (Braga et al., 2019).

3. Conceptual Framework

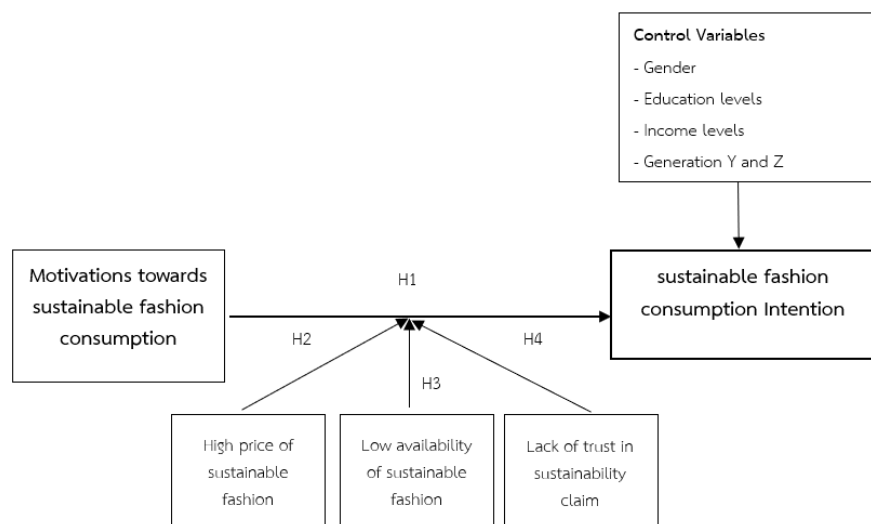


Figure 1 Conceptual Framework

The conceptual framework is built upon the findings of the literature review. The motivations influence sustainable consumption intention. However, the attitude-behavior gap effect their actions. The barriers will be investigated. The independent variable is motivation and dependent variable is sustainable fashion consumption intention. In addition, moderator variables are high price of sustainable, low availability of sustainable fashion and lack of trust in sustainability claim. Therefore, the research purpose to investigate the relationship between the motivation and sustainable fashion consumption intention. This research investigates the comparison of consumers between Generation Y (Millennials),

who were born between 1980 and 1996 (aged 28-44 in 2024), and Generation Z, who were born since 1997 to 2012 (aged 12-27 in 2024).

4. Method and results

This research study utilizes a quantitative method for data collection via online survey questionnaire using Google Forms. A total of 234 samples were collected from Generation Y and Z in Thailand.

Multiple regression analyses by SPSS were conducted separately for Generations Y, Z, and combined.

Variables	Model 1			Model 2			Model 3		
	Beta	p	VIF	Beta	p	VIF	Beta	p	VIF
Gen Z	.151	.054	1.961	.116	.110	1.998	.086	.233	2.042
Male	-.068	.253	1.129	-.074	.190	1.194	-.059	.286	1.208
Bachelor Degree	.013	.870	2.024	.031	.674	2.028	.034	.642	2.032
Master Degree	.040	.646	2.406	.038	.635	2.413	.011	.892	2.510
Income	.114	.160	2.079	.098	.187	2.089	.099	.180	2.119
Motivation (MO)	.500	.000*	1.186	.275	.000*	1.604	.295	.000*	1.650
High price (B1)				-.266	.000*	1.406	-.284	.000*	1.448
Low availability (B2)				-.149	.014*	1.389	-.150	.015*	1.458
Lack of trust sustainability claim (B3)				-.140	.013*	1.196	-.179	.003*	1.403
MO*B1							-.219	.007*	2.528
MO*B2							.038	.653	2.831
MO*B3							.067	.371	2.216
R ²	.000			.000			.029		
R ² Change				.124			.024		
Sig. F Change	.000			.000			.029		
Observations	234			234			234		

Note: *p < 0.05

Figure 2 Regression results of Generation Y and Z

Variables	Model 1			Model 2			Model 3		
	Beta	p	VIF	Beta	p	VIF	Beta	p	VIF
Male	-.123	.148	1.119	-.060	.472	1.254	-.046	.575	1.259
Bachelor Degree	-.426	.054	7.445	-.370	.071	7.530	-.343	.090	7.669
Master Degree	-.379	.087	7.516	-.346	.092	7.544	-.341	.096	7.849
Income	.068	.406	1.022	.006	.942	1.064	.031	.684	1.104
Motivation (MO)	.446	.000*	1.123	.336	.000*	1.224	.329	.000*	1.261
High price (B1)				-.311	.000*	1.287	-.303	.000*	1.354
Low availability (B2)				-.115	.173	1.278	-.144	.084	1.303
Lack of trust sustainability claim (B3)				-.092	.258	1.183	-.137	.098	1.285
MO*B1							-.248	.009*	1.665
MO*B2							.041	.697	2.089
MO*B3							.040	.673	1.682
R ²	.269			.392			.435		
R ² Change				.123			.043		
Sig. F Change	.000			.000			.048		
Observations	120			120			120		

Note: *p < 0.05

Figure 3 Regression results of Generation Y

Variables	Model 1			Model 2			Model 3		
	Beta	p	VIF	Beta	p	VIF	Beta	p	VIF
Male	-.012	.887	1.148	-.080	.316	1.229	-.076	.350	1.256
Bachelor Degree	.069	.431	1.275	.073	.369	1.283	.074	.374	1.303
Master Degree	.030	.737	1.279	.022	.799	1.459	.016	.857	1.476
Income	.104	.253	1.367	.154	.071	1.397	.149	.086	1.412
Motivation (MO)	.535	.000*	1.146	.224	.035*	2.154	.234	.034*	2.270
High price (B1)				-.271	.009*	2.004	-.294	.007*	2.155
Low availability (B2)				-.073	.391	1.398	-.072	.404	1.407
Lack of trust sustainability claim (B3)				-.230	.007*	1.381	-.244	.010*	1.676
MO*B1							-.097	.527	4.486
MO*B2							-.009	.947	3.570
MO*B3							.038	.767	3.131
R ²	.347			.464			.469		
R ² Change				.117			.005		
Sig. F Change	.000			.000			.813		
Observations	114			114			114		

Note: *p < 0.05

Figure 4 Regression results of Generation Z

The results of hypotheses testing:

Hypothesis 1: Motivations positively affect sustainable fashion consumption intention. Supported for combined generations and separately for Generations Y and Z.

Hypothesis 2: High price negatively moderates the relationship between motivations and sustainable fashion consumption intention. Supported for combined generations and Generation Y. Generation Z was not significant.

Hypothesis 3: Low availability does not moderate the relationship between motivations and sustainable fashion consumption intention. Not supported; no significant results for both generations combined and separately.

Hypothesis 4: Lack of trust does not moderate the relationship between motivations and sustainable fashion consumption intention. Not supported; no significant results for both generations combined and separately. Direct effect significant for Generation Z.

5. Discussion

Motivations such as self-image, environmental, and social concerns significantly influence sustainable fashion consumption intentions in both generations. High prices act as a barrier, particularly for Generation Y. Low availability and lack of trust do not significantly moderate the relationship between motivations and consumption intentions. Generation Z shows significant direct effects regarding high price and lack of trust, emphasizing the need for transparent communication from brands.

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MS0031: The Interaction between Domestic and Outward Foreign Direct Investment in China: The Influence of Region-specific Context

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The Interaction between Domestic and Outward Foreign Direct Investment in China: The Influence of Region-Specific Context

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Abstract: Since the Chinese government launched the Belt and Road Initiative, state-owned enterprises and private conglomerates have increased overseas investment. The massive outward foreign direct investment (OFDI) profoundly affects China's regional development to varying degrees. Existing studies have mainly investigated the effect of foreign direct investment inflow on domestic investment (DI), but only a few studies have examined the impact of OFDI on DI. Though most researchers have indicated that OFDI activities can promote (or inhibit) DI in a particular country, they have overlooked how OFDI's geographical distribution and motivation across the Chinese macro-regions have influenced DI. To fill these gaps, this paper examines the impact of such OFDI on DI in China and its macro-regions, using a province-level dataset from 2005 to 2021. It employs panel regression and rigorously tests the data using the generalised method of moments to address endogeneity issues. We also investigate the investment motivations of the top 100 Chinese multinationals with significant FDI outflows from 2015 to 2018. We find that OFDI has positively and markedly influenced DI in eastern coastal and central inland regions but not in western China. Though OFDI has positively affected DI in China, it may not hold in a regional context. Such OFDI seeks to enhance the efficiency of existing investment, expand domestic markets, and look for strategic assets. Our findings indicate that central and provincial governments could develop OFDI policies to cater to significant regional variations. Local governments should also consider the various OFDI motivations of Chinese multinationals and provide adequate support for developing and implementing local investment policies that encourage domestic firms to invest abroad.

Keywords: China; regional development; outward foreign direct investment; domestic investment; Belt and Road Initiative

JEL Classification: F23, O18, P25, R11

1. Introduction

Since the late 1970s, China's opening-up policy and economic reforms have encouraged the development of outward foreign direct investment (OFDI) policies. Many researchers have described the gradual, staged implementation of these policies [1, 2]. From 1992 to 2001, the Chinese central government encouraged companies engaged in global trade and cross-border production networks to invest in foreign markets to support export and manufacturing operations abroad. Following China's accession to the World Trade Organization in 2001, the Chinese government adopted its *Going Out* strategy (*zou chu qu*). This *Going Out* policy encouraged Chinese firms to seek new markets. Since 2013, the Chinese government has implemented a new global development strategy. Belt and Road Initiatives sparked interest in major overseas projects in finance, mining, wholesale and retail, manufacturing, and transportation services [3]. By August 2023, the Chinese government signed cooperation memoranda or issued joint statements with 152 countries and 32 international organisations, partly building out the Belt and Road Initiatives. With the progressive internationalisation of the Chinese yuan (RMB), the rapid growth of digital financial technology, and the profound influence of the host country's governance, OFDI have increased dramatically in China over the last decade [4, 5, 6].

From an academic perspective, previous literature has examined chiefly the influence of China's OFDI on economic growth and development [7, 8]. Still, few studies have investigated the OFDI-DI nexus in regions (or provinces). Since China's growth model heavily relies on domestic capital formation, recent significant capital outflows have alarmed regional planners and policymakers. These policymakers worry about their potential effects on domestic investment (DI) [9]. China became the world's first largest foreign direct investment (FDI) outflow source in 2020, totalling roughly US\$ 133 billion [10]. The size of these FDI outflows matters less than how they compare to the flow of DI. On the one hand, OFDI and DI are complements [11]. Both serve to establish backward and forward links in the production chains operating in China. On the other hand, such OFDI displaces DI for foreign activities [12]. As firms shift a portion of their production abroad, the financial resources available for domestic development decline. A consensus on the effect of OFDI on domestic gross capital formation in China remains elusive.

Studies of foreign countries have made greater headway. Many researchers have looked at OFDI and DI in countries like the United States, Germany, Italy, and newly industrialised countries like South Korea [13, 14]. Existing studies examine the firm level [15], industry level [16], and country level [17], respectively. Some studies cover a limited period, a few industries, or only multinational enterprises [18]. These limited studies thus likely suffer from sample selection bias. Additionally, burgeoning literature examines OFDI-DI association across countries within different continents (or economic blocs), but there is a lack of studies investigating the above relationship *within* a particular country. From a geographic perspective, many researchers treat China as a single spatial aggregate and generalise the findings to the entire country. Yet, subject to the significant differences in factor endowments, political and economic structures, and socio-cultural backgrounds between Chinese regions and Belt and Road Initiatives projects abroad, those previous studies that treated China as a homogeneous entity (i.e., without considering the vast differences between inland and coastal areas) may somehow constrain their applicability [19, 20]. Apart from the previous literature focusing on China's OFDI-DI nexus, a paucity of studies has examined how OFDI's motivation has influenced DI across the Chinese macro-regions [21].

Against this backdrop, three related questions remain unsolved: (1) At the macroeconomic level, what is the regional impact of the OFDI on DI in developing and emerging economies like China? (2) How do OFDI motivations influence China's and its macro-regions' DI? More importantly, (3) What are the policy implications for improving OFDI and DI's efficiency? We use the panel regression method on annual data at the provincial level from 2005 to 2021 to investigate the OFDI-DI nexus for China and its macro-regions.

This research is a pioneering study, contributing three ways to the academic debate on the OFDI-DI association. First, unlike previous studies, we show the precise impacts of the OFDI on DI for China and its macro-regions rather than the aggregated effect of OFDI on DI. Second, contrasted with earlier studies debating the OFDI-DI nexus at the country level, we find that the OFDI for China, Eastern, and Central China has a complementary relationship with their DI. At the same time, that for Western China does not affect DI. The conflicting results indicate that

regional factors matter. Differences in institutional quality, financial capabilities, and levels of economic development between coastal and inland regions help account for these differing relationships. Second, we describe the motivations for engaging in OFDI. The reasons for OFDI are based on improving DI efficiency, acquiring natural resources, or buying strategic assets [21]. Our findings intimate that much OFDI seeks to enhance the efficiency of existing investment, expand overseas markets, and search for strategic assets. Chinese policymakers would thus do well in designing policies targeted at the motivations and aims of such OFDI at the regional/provincial level.

The rest of the research is organised as follows. The following section critically reviews the literature on the OFDI-DI nexus. The second section presents data and methodology. Section 3 shows our regression results and provides an in-depth analysis of them. Finally, Section 4 concludes with a summary of our findings and policy implications.

2. Theoretical framework and literature

2.1. The relationship between OFDI and domestic investment: Theories and empirical evidence

Scholars have debated the relationship between OFDI and DI over decades. From a theoretical perspective, the mechanism of OFDI's influence over the home country's DI mainly arises through financial and product markets. In an imperfect financial market, FDI outflows may raise domestic interest rates by transferring funds abroad, making it difficult for domestic firms to borrow money. Likewise, local firms seeking to invest in foreign markets may decrease domestic exports by funding overseas manufacturing operations and diverting DI. Consequently, OFDI leads to replace DI [22]. Nevertheless, if OFDI augments the home country's exports through forward and backward linkages, it may complement DI. Thus, as FDI outflows may exert positive, negative, or neutral influence over the home country's DI, Al-Sadig suggests reassessing the OFDI-DI nexus is necessary to determine the overall effects of such FDI outflows [23].

Several studies document different views on the OFDI-DI association. First, some researchers find OFDI leads to complement DI (i.e., crowding-in effect). As Desai, Foley, and Hines argue [19], looking specifically at the United States, outward FDI enabled U.S. parent companies to import lower-cost raw materials from foreign affiliates. Such FDI outflows also allowed these companies to export the intermediate inputs needed by their foreign affiliates. Industries including foreign affiliates in their value chains could reduce production costs and generate economies of scale, thus increasing domestic output and investment. As a result, the entire domestic economy can benefit from backward and forward-looking production links between local firms and MNEs. In Taiwan, the study by Hsu, Wang, and Clegg supports a complementary relationship between FDI and gross capital formation has been found in Taiwan [11]. FDI helped allocate capital effectively between host and home regions, benefiting both areas. Taiwanese multinational corporations' investment in China's labour-intensive industrial value chains helped lower production costs. Similarly, Gondim, Ogasavara, and Masiero indicate FDI outflows from Brazil contributed to more local investment there. As such, OFDI is a crowded-in investment [24].

Second, in many developed economies, direct investment abroad has overtaken domestic investment [25]. In the analysis of OFDI and investment trends in 121 developing and emerging economies, FDI outflows serve to replace domestic investment (i.e., crowding-out effect). Domestic bottlenecks and distortions in the home country's economy, such as imperfect financial markets or capital controls, could help explain such negative associations. OFDI could quickly outstrip DI as many multinational enterprises in developing countries invested in foreign assets to collateralise domestic debts rather than diversify or mitigate financial risk. Supported by Sauramo, OFDI tempered DI activity in Finland. Such foreign direct investment out of Finland replaced Finnish exports abroad, dampening the demand for local labour. A lack of capital and an inefficient financial market also constitute the substitution effect of OFDI on DI. Finland's strong OFDI growth primarily explains its multinational enterprises' small local investment [26].

Third, some researchers have found the opposite results. They indicate the mixed relationship between FDI outflows and DI. In analysing Korean and Chinese OFDI from 1988 to

2002, only Chinese OFDI fluctuated with DI [27]. Even though incentives to engage in OFDI could depress DI in many developing countries, they had the opposite effect in some emerging economies. Cross-border FDI encouraged long-term investment between Southeast Asian countries. Such a result stemmed from the increased intra- and inter-firm trade such investment occasioned. Differing levels of technological advancement, institutional frameworks, and national development could also explain much variation between FDI and investment across ASEAN countries [28]. Moreover, the results were mixed when Kurtovic, Maxhuni, Halili, and Krasniqi examined the OFDI-DI relationship for the Central, East, and Southeast European countries. OFDI of Estonia and Latvia exert a crowding-in effect on DI, while those of Bulgaria, Poland, and Slovenia demonstrate a substitution effect on DI. Different motives, strategies, and decisions of domestic companies from the Central, East, and Southeast European countries display various specific features of their OFDI [29].

In Germany, OFDI triggered more DI in the short run but substituted for such investment in the longer run. High and rising labour costs and increased economic integration across the European Union sent several German multinational corporations into lower-cost Central and Eastern Europe manufacturing environments [14]. Previous research had an over-emphasised role of multinational investment in determining the extent of complementary or substitute domestic investment. They argue, instead, for host-country and industry-specific effects in driving OFDI-DI outcomes [11]. Yet, among these studies, Hejazi and Pauly argue that multinational enterprises' production abroad, which gives rise to a positive, negative, or neutral effect on DI, hinges on the motivation behind OFDI [21].

2.2. OFDI motivations for DI

According to Dunning and Lauren, understanding OFDI is closely related to the eclectic paradigm, emphasising three important aspects: ownership-specific (O), location-specific (L), and internalisation-specific (I) [30]. The OLI paradigm postulates a firm will establish an offshore production base when a host country offers L-specific advantages, such as abundant raw materials, cheap labour, and huge market potential, to a firm possessing O-specific advantages,

for instance, renowned brand name, and advanced technology and both advantages can be operated through internalisation of production through FDI. Hence, each firm seeks the optimisation of O-, L- and I-specific advantages.

Extended by the OLI paradigm, four motivations for multinational enterprises to invest abroad have been described, thus affecting domestically more or less [21]. The *resource-seeking* multinational enterprises essentially choose to acquire natural resources unavailable in their home countries or at a lower cost. Such a motivation would positively impact DI by crowding in work on primary commodity processing and intermediate consumption [24]. The *market-seeking* multinational enterprises might invest in substitutes for the country's exports or relocate domestic production abroad in a trade bloc like the United States-Mexico-Canada Agreement region. A US firm investing in Mexico to sell to its roughly 130 consumers more directly might represent this motivation. The *efficiency-seeking* multinational enterprises might take advantage of factor price differences by investing in locations with lower production costs [21]. The *strategic assets-seeking* multinational enterprises might invest abroad to acquire complementary assets that bolster its competitive advantages [7]. However, some researchers have criticised these four motivations, failing to explain how these motivations work with the OFDI-DI nexus at the industry or firm levels because different OFDI motivations may produce different results (i.e., crowding-in or crowding-out effects) on DI [15].

2.3. China's OFDI effects on DI – A normal or deviant case?

The findings on China similarly conflict with each other. Based on Ameer, Xu, and Alotaish, a macro-level study of OFDI on DI failed to find any cause-and-effect relationship between them in the short run. The positive association between the two ran only one way in the long run. China's underdeveloped financial markets encouraged OFDI, as Chinese multinationals faced far tighter financial constraints than multinationals from advanced countries [31]. State-owned enterprises accounted for much of the Chinese multinationals' OFDI, as they benefited from access to China's rapidly accumulating foreign exchange reserves. Chinese overseas investment had little impact on local financial liquidity, and such OFDI did not replace domestic capital

formation as a source of growth [7]. Though the analysis of FDI and DI considered factors contributing to domestic credit to China's private sector, the real interest rate, and institutional quality, Chinese investors preferred to invest abroad rather than at home. Nevertheless, these authors overlooked the regional variation in OFDI and DI between Chinese regions. Some researchers have speculated that these studies' neglect of a regional-level analysis may explain these seemingly contrasting results [12, 32].

3. Methods and data

3.1. Data and variable selection

To address these gaps in the literature, our study uses a panel dataset spanning 31 Chinese provinces, municipalities, and autonomous regions from 2005 to 2021. The data come from various *China Statistical Yearbooks*, *China Provincial Statistical Yearbooks*, and *Chinese Outward Foreign Direct Investment Statistical Bulletins*. We break our data into three macro-regions – Eastern, Central, and Western China following the Seventh Five-Year Plan (1986–90) adopted by the Chinese government. Several provinces, municipalities, or autonomous regions with similar characteristics are aggregated into macro-regions. This regional delineation has been widely applied in academic research. Besides, we follow this grouping to conduct our inter-regional analysis to facilitate the comparison of estimation results with previous studies [7, 8, 33]. In this study, DI serves as our dependent variable.

We deploy two conceptual frameworks to inform our empirical methods. First, following Feldstein, Desai, Foley and Hines, and Ali, Wang, Morales, and Wang, we adopted an extension of Feldstein and Horioka's model [16, 18, 25, 34], where we assume that the level of DI depends on OFDI, inward foreign direct investment (IFDI), and domestic savings (DS) that are widely adopted by previous studies. Furthermore, as He, Wei and Xie, and Wei note, China's regional development was sharply transformed by the fundamental processes of exerting globalising forces, the infusion of market mechanisms, and the decentralised control of economic development by local states over decades [35, 36]. As such, the second model sees regional DI as the result of globalisation, marketisation, and the decentralised control of local economic

development. We set up the model specification [i.e., Eq. (1)]. Variable definitions, measurements, and data sources are presented in Table 1.

Table 1. Explanatory variables and data sources

Variable	Measurement	Data source
DI	Domestic investment, measured by total investment in fixed assets invested by private enterprises over gross regional product	China Provincial Statistical Yearbook
OFDI	Outward foreign direct investment, measured by outward direct investment flows divided by gross regional product	The Statistical Bulletin of China's Outward Foreign Direct Investment
IFDI	Inward foreign direct investment, defined by inbound foreign direct investment flows divided by gross regional product	China Provincial and Municipal Statistical Yearbook
DS	Domestic savings, measured by the deposits held by financial intermediaries over gross regional product	China Provincial and Municipal Statistical Yearbook
PGR	Population growth, defined by the annual growth rate of the <i>de-facto</i> population at year-end	China Statistical Yearbook
EDUL	Education level, measured by the number of people who have completed at least secondary education divided by the total number of <i>de-facto</i> population at year-end	China Statistical Yearbook
RD	Research and development intensity, defined by research and development expenditure as a share of gross regional product	China Statistical Yearbook
EXPT	Export, defined by the total amount of the region's exports to the host country over gross regional product	China Statistical Yearbook
INF	Investment in infrastructure, defined by gross fixed capital formation over gross regional product	China Statistical Yearbook
IND	Level of industrial development, measured by industrial added value divided by gross regional product	China Statistical Yearbook

Note: N.A. means not applicable. Unless specified, the above variables are independent.

3.2. Dependent and major independent variables

We use the share of total private enterprises' fixed asset investment divided by gross regional product to gauge the impact of FDI on Chinese regional DI [19, 23]. Moreover, we deploy OFDI flows divided by gross regional product as our major explanatory variable [13, 23]. We do not

take an a priori stance on whether the relationship between FDI and regional DI should be positive or negative.

We include IFDI because some research finds a strong association with DI. IFDI boosts DI for firms seeking greater export competitiveness from economies of scale and agglomeration economies [37]. As inconclusive findings exist as to the direction of this relationship [38], we use a two-sided hypothesis (testing for a positive or negative relationship) between IFDI and DI. Such foreign-sourced investment could either crowd in or crowd out DI. Following the previous finding [25], we posit a positive relationship between DS and DI.

3.3. Control variables

Several other variables could interfere with the relationship between OFDI and DI. Population growth (PGR), educational level (EDUL), and research and development spending (RD) control for the influence of marketisation across Chinese regions. First, many countries are in various stages of demographic transition, affecting population dynamics. As such, we use the regional population growth rate (PGR) to control the influence of *de-facto* population [39]. Second, some research deploys the number of graduates who attain the highest levels of schooling (i.e., senior secondary school graduates) to proxy for labour quality. Thus, we apply the number of people who have completed at least secondary education (EDUL) to control for the educational level [40]. Third, following previous research, we choose research and development expenditure as a share of gross regional product (RD) to control research and development intensity [41]. Finally, we include each region's export performance (EXPT) to control for broader globalisation affecting each region. To mitigate the effects of decentralisation, we use the variables level of industrial development (IND) and infrastructure investment (INF) [35].

3.4. Model specification

Our empirical model investigates the potential impact of OFDI on DI across China and three macro-regions. Basing our description of these macro-regions on China's Seventh Five-Year

Plan (1986–1990), Eastern China comprises Liaoning, Hebei, Beijing, Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Guangxi, and Hainan. Central China covers Heilongjiang, Jilin, Inner Mongolia, Shanxi, Henan, Anhui, Hubei, Jiangxi, and Hunan. Western China consists of Xinjiang, Gansu, Qinghai, Ningxia, Shaanxi, Tibet, Sichuan, Chongqing, Guizhou, and Yunnan.

We augment pooled ordinary least squares (OLS) regression with fixed-effects (FE) and random-effects (RE) models to test and potentially control for province- and time-specific effects. Our panel included observations on the above variables from 2005 to 2021. Equation (1) describes our regression model. The subscript i represents the 31 individual provinces, and t represents the 17 time periods. The parameter α represents the intercept, while ε_{it} is the error term for each regression.

$$DI_{it} = \alpha_i + \beta_1 OFDI_{it} + \beta_2 IFDI_{it} + \beta_3 DS_{it} + \beta_4 PGR_{it} + \beta_5 EDUL_{it} + \beta_6 RD_{it} + \beta_7 EXPT_{it} + \beta_8 INF_{it} + \beta_9 IND_{it} + \varepsilon_{it} \quad (1)$$

Prior to estimation, the possibility of cross-sectional dependence in our model’s residuals must be investigated using the cross-sectional dependency (CSD) test proposed by Pesaran [42]. Cross-sectional dependency is defined as the correlation between cross-sectional units in panel data. Suppose the cross-sectional units (i.e., provinces) that comprise the time series are interdependent. In that case, any external shock, such as political, economic, social, and cultural associations, occurring in any unit in the time series will have a distinct influence on all units in the series. Otherwise, an external shock in one cross-sectional unit of the series within the panel will have an equal impact on all units, rendering the time series independent. Three CSD tests are used: The Breusch-Pagan Lagrange Multiplier (LM) [43], the Pesaran Scaled LM [44], and the Pesaran CD [44]. The null hypothesis for all three tests is no cross-sectional dependence. If the p-values exceed the 5% significance level, we will accept no cross-sectional dependence in the residuals.

After detecting cross-sectional dependency in our model, we use the slope homogeneity test to determine whether differences in one region's system affect another, such as different socioeconomic structures. If the socioeconomic structure of one region differs from another, the slope coefficients are likely to be different. Otherwise, the slope coefficients may be homogeneous if the socioeconomic structures are comparable. To determine whether the slope coefficients of Eq. (1) in cross-section are homogeneous, we use Hsiao's [45] homogeneity test. Hsiao's test examines three hypotheses: H_1 , H_2 , and H_3 . H_1 states that the slope coefficients are homogeneous, whereas the alternative hypothesis allows for heterogeneity. While H_2 adheres to the homogeneous assumption, the alternative H_2 accepts heterogeneity. The final hypothesis, H_3 , states that the slope coefficients are homogeneous, whereas the alternative hypothesis claims they are partially homogeneous. If the p-values from the preceding tests are less than 0.05, the null hypotheses are rejected, indicating that the slope coefficients are heterogeneous.

Besides, we perform a robustness check by taking out the variable EXPT in the model specification (see Eq. (1)) and examining whether the coefficients of OFDI are unbiased and consistent for China and its macro-regions. Lastly, in Eq. (1), a potential causality exists between FDI and EXPT. FDI may contribute to export growth by facilitating technology transfers, upgrading the export structure of a host region, and increasing access to global distribution networks to sell products in international markets [46]. Conversely, expanding exports in home regions leads to greater demand for good transportation infrastructure, which attracts more foreign direct investment. Additionally, historical events and activities may have a significant contemporaneous effect on DI. To address potential endogeneity issues, we use a panel generalised method of moments (GMM) procedure to confirm the dynamic nature of the model specification and run over-identification and serial correlation tests [47, 48]. Because FDI may have lag effects on exports and *vice versa*, we also instrument FDI and EXPT variables with one-year lagged values.

As previously stated, we must perform the GMM procedure to validate our results. To begin, we run the OLS with a one-year lagged DI value to assess its persistence effect. If the DI's one-year lagged coefficient is positive and significant at the 5% level, the DI's persistence effect

is valid for the following tests. Second, to perform an overidentification test, we obtain the Hansen J-statistic for China and its macro-regions to determine whether all overidentification restrictions are valid. When the p-value falls between 0.25 and 1.00 [49], we accept the null hypothesis, indicating that instrument validity has been established. Otherwise, we will reject the null hypothesis due to at least one invalid instrument [50]. Finally, to perform the serial correlation test, we calculate the value of the second-order autocorrelation AR(2). We propose the null hypothesis of no second-order serial correlation. If the p-value of AR(2) is greater than 0.05, we do not reject the null hypothesis, indicating that the moment conditions are correctly specified.

3.5. Assessment of the impact of OFDI motivations on DI

Likewise, we speculate about the motivations of large Chinese MNEs to invest abroad directly. To study their motivations, we identify the top 100 Chinese multinationals, ranked by their stocks of OFDI in 2015–2018, as reported in the *Outward Foreign Direct Investment Statistics Bulletin of China*, and *Report on Development of China's Outward Investment*. We examine recent merger and acquisition transaction information from financial intelligence, annual reports, and corporate announcements. After investigating the details of relevant merger and acquisition transactions, we encapsulate the motivations for OFDI of those companies in the respective macro-regions. We code their experiences as either resource-seeking, market-seeking, efficiency-seeking, or strategic-assets-seeking OFDI as recorded in the *Outward Foreign Direct Investment Statistics Bulletin of China* and *Report on Development of China's Outward Investment*. We are attempting to determine how OFDI motivation affects DI in conjunction with the statistical findings.

4. Estimation results and discussion

4.1. Descriptive statistics

Before analysing our results, we need to examine the descriptive statistics of each variable. Table 2 indicates the descriptive statistics, whereas Table 3 depicts the correlation matrix of each

variable. Our statistical results show that almost all variables are positively correlated, and no apparent outliers have been revealed. Moreover, no multicollinearity among our variables arises as no correlation coefficients appear sufficiently high.

Table 2. Descriptive statistics of each variable.

Variables	DI	OFDI	IFDI	DS	PGR	EDUL	RD	EXPT	INF	IND
Mean	0.691	0.004	0.022	1.754	0.006	0.006	0.013	0.149	0.686	0.080
Median	0.688	0.002	0.018	1.586	0.004	0.006	0.011	0.076	0.533	0.072
Maximum	1.504	0.071	0.104	5.587	0.058	0.009	0.061	0.904	54.346	0.204
Minimum	0.181	0.003	0.000	0.563	0.051	0.002	0.000	0.004	0.243	-0.178
Standard deviation	0.265	0.007	0.018	0.777	0.012	0.001	0.010	0.169	2.349	0.039
Skewness	0.301	4.768	1.308	2.363	0.869	-0.365	2.386	2.104	22.737	-0.061
Kurtosis	0.191	29.671	1.970	6.802	4.155	0.463	7.957	4.410	520.258	3.482
Observation	527	527	527	527	527	527	527	527	527	527

Table 3. Correlation matrix of each variable.

Variables	DI	OFDI	IFDI	DS	PGR	EDUL	RD	EXPT	INF	IND
OFDI	0.013*** (0.007)									
IFDI	0.110*** (0.017)	0.015*** (0.018)								
DS	0.029*** (0.766)	0.196*** (0.697)	0.007** (0.775)							
PGR	0.015*** (0.012)	0.003 (0.012)	0.055*** (0.012)	0.069*** (0.012)						
EDUL	0.208*** (0.001)	0.112*** (0.001)	0.047*** (0.001)	0.202*** (0.001)	0.009** (0.001)					
RD	0.144*** (0.009)	0.101*** (0.009)	0.158*** (0.009)	0.262*** (0.008)	0.106*** (0.009)	0.122*** (0.009)				
EXPT	0.287*** (0.142)	0.033*** (0.166)	0.211*** (0.150)	0.056*** (0.164)	0.213*** (0.150)	0.123*** (0.158)	0.219*** (0.149)			
INF	-0.001 (2.351)	-0.002 (2.351)	-0.002 (2.352)	-0.001 (2.351)	-0.002 (2.352)	-0.002 (2.351)	0.005* (2.344)	0.002 (2.348)		
IND	0.090*** (0.037)	-0.001 (0.039)	0.068*** (0.038)	0.058*** (0.038)	0.017*** (0.039)	-0.002 (0.039)	0.061*** (0.038)	0.082*** (0.037)	0.004* (0.039)	

Note: The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1%, respectively (* $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$).

4.2 Cross-sectional dependence and slope homogeneity

As previously mentioned, testing cross-sectional dependency and slope homogeneity in the panel data in the study of panel data regression is essential for choosing the appropriate estimators. Hence, we run the cross-sectional dependency and slope homogeneity tests, and the results are presented in Table 4. For cross-sectional dependence, the CD's test statistic in Eastern China is significant at a 5 per cent level, while the rest of CD_{BP} 's, CD_{PS} 's and CD's test statistic at the country and regional levels are significant at a 1 per cent level, implying that all null hypotheses (i.e., H_1 , H_2 and H_3) are rejected. Our results support the fact that cross-sectional dependency exists across provinces. In slope homogeneity, as our results demonstrated that the p-values for all H_1 , H_2 and H_3 in the national and regional context are less than 0.05, all null hypotheses are rejected, showing that the slope of coefficients is heterogeneous. Briefly, cross-sectional dependence and slope heterogeneity exist in the panel data of China, Eastern China, Central China, and Western China. According to Sarafidis and Robertson [51], using fixed-effect models can control for province-specific effects, thereby capturing time-invariant heterogeneity across provinces and mitigating the bias of these fixed-effect estimators caused by cross-sectional dependence in panel data. Hence, fixed-effect models are primarily considered in our regression models, while random-effect models are also run for reference.

Table 4. Cross-sectional dependence and slope homogenous tests of China and its macro-regions.

Test/ regions	Test statistic			
	China	Eastern China	Central China	Western China
Cross-sectional dependency test				
CD_{BP}	3,268.272***	416.526***	98.931***	177.147***
CD_{PS}	91.923***	30.509***	7.417***	13.929***
CD	34.692***	2.298**	3.119***	6.913***
Slope homogeneous test (Hypotheses)				
H_1	31.598***	48.348***	9.334***	8.931***

H ₂	18.622***	42.761***	5.074***	5.741***
H ₃	13.778***	4.181***	14.881***	10.624***

Note: CD_{BP} represents the cross-sectional dependence test of Breusch and Pagan [43], whereas CD_{PS} and CD are those of Pesaran [44], respectively; The symbols *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively (* $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$)

4.3. Regression results

Table 5 provides a first look at our variables for China. DI has a statistically significant relationship with OFDI. Reassuringly, DS also statistically significantly vary with DI. With the control variables included, our fixed-effect models have relatively good explanatory power with R-squared values of over 0.6 across models. Also, our Hausman test results demonstrate that fixed-effect models stratified by provinces and controlling for endogeneity are more appropriate for the data.

Table 5. Regression results for China nationwide.

Dependent variable	Domestic investment (DI)				
	Model (1) - OLS	Model (2) – Random-effects	Model (3) – Fixed-effects (main specification)	Model (4) – Fixed-effects (robustness check)	Model (5) – Fixed-effects (GMM)
Intercept	0.539*** (0.067)	0.209*** (0.067)	-0.095 (0.074)	-0.101 (0.072)	0.038 (0.058)
OFDI	2.765** (1.369)	3.161*** (1.196)	3.267** (1.267)	3.363** (1.233)	2.197** (0.993)
IFDI	-0.636 (0.577)	0.016 (0.613)	0.659 (0.678)	0.599 (0.652)	0.946* (0.506)
DS	0.001 (0.017)	0.084*** (0.019)	0.234*** (0.026)	0.237*** (0.025)	0.143*** (0.031)
PGR	3.123*** (0.836)	2.055*** (0.748)	2.023** (0.785)	1.979** (0.773)	1.832*** (0.618)
EDUL	61.484*** (7.769)	81.855*** (7.576)	61.025*** (8.719)	60.361*** (8.482)	29.824*** (8.738)
RD	-2.737** (1.268)	1.568 (1.303)	6.258*** (1.471)	6.288*** (1.466)	4.071*** (1.205)
EXPT	-0.617*** (0.071)	-0.569*** (0.091)	-0.043 (0.131)	- -	-0.033 (0.099)
INF	-0.002 (0.004)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.002)
IND	-1.136***	-1.231***	-1.161***	-1.162***	-0.978***

	(0.268)	(0.232)	(0.239)	(0.239)	(0.245)
Observations	527	527	527	527	527
R-squared	0.421	0.285	0.667	0.668	0.836
Hausman Test (p-value)			106.897 (0.000)	109.083 (0.000)	

Note: The symbols *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively (* $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$); Parentheses state standard deviation.

Running the same regressions for China's eastern provinces shows somewhat different trends. Table 6 shows that, for these provinces, OFDI clearly explained DI over time. All models produced statistically significant results. Based on the Hausman test result, we choose the random-effects model. Yet, our finding indicates the parameter estimates for IFDI proved highly unstable. According to the OLS model, IFDI tends to replace DI. IFDI appears to continue to have a significant relationship with DI when controlling for province-level effects.

Table 6. Regression results for Eastern China.

Dependent variable	Domestic investment (DI)				
	Model (6) – OLS	Model (7) Random-effects	Model (8) – Fixed-effects (main specification)	Model (9) – Fixed-effects (robustness check)	Model (10) – Fixed-effects (GMM)
Intercept	0.671*** (0.109)	0.668*** (0.109)	0.798*** (0.049)	0.108 (0.137)	0.305** (0.151)
OFDI	2.492** (1.218)	2.381* (1.222)	1.843** (0.743)	2.379* (1.349)	2.223* (1.355)
IFDI	-1.341** (0.625)	-1.261** (0.626)	-1.237*** (0.426)	-0.936 (0.911)	0.161 (1.008)
DS	-0.083*** (0.021)	-0.083*** (0.021)	-0.105*** (0.009)	0.092** (0.041)	0.054 (0.044)
PGR	1.422 (0.952)	1.462 (0.953)	1.579*** (0.505)	0.933 (1.001)	1.432 (1.116)
EDUL	34.205** (14.078)	34.778*** (14.024)	9.464 (7.008)	28.035* (15.163)	23.156 (18.084)
RD	1.595 (1.408)	1.594 (1.407)	1.759*** (0.575)	4.333*** (1.578)	3.806** (1.589)
EXPT	-0.585*** (0.066)	-0.581*** (0.066)	-0.524*** (0.042)	- -	-0.267 (0.176)
INF	-0.001 (0.003)	-0.001 (0.003)	0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)
IND	-0.024 (0.459)	-0.046 (0.461)	-0.011 (0.222)	0.218 (0.537)	-0.299 (0.568)
Observations	204	204	204	204	204
R-squared	0.511	0.532	0.728	0.582	0.609
Hausman Test (p-value)			45.193 (0.000)	18.435 (0.018)	

Note: The symbols *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively (* $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$).

The results for China's central provinces confirm the general patterns described for the whole sample. Table 7 shows these results. OFDI also statistically significantly varies with DI across models. Only the OLS model shows a statistically significant relationship between DI and IFDI. Such a finding shows the fragility of any conclusion about IFDI and DI. Treating central and coastal provinces separately increases our models' explanatory power, as the R-squared values for these models are like those in Table 5. Given that fixed-effects modelling should have controlled for province-level effects, these results indicate that some pan-provincial effects across China's central provinces appear to have some effects. Our literature review did not mention any specific regional factor affecting these central provinces. These relationships break down for Western China. Table 8 exhibits the lack of statistically significant OFDI coefficients for these provinces only. High R-squared values suggest the absence of a relationship does not stem from model misspecification or other problems.

Table 7. Main empirical results for Central China.

Dependent variable	Domestic investment (DI)				
	Model (11) – OLS	Model (12) - Random-effects	Model (13) – Fixed-effects (main specification)	Model (14) – Fixed-effects (robustness check)	Model (15) – Fixed-effects (GMM)
Intercept	-0.362*** (0.116)	-0.321*** (0.109)	-0.325*** (0.097)	-0.234** (0.097)	-0.219** (0.091)
OFDI	36.723*** (8.683)	23.311*** (7.069)	21.661*** (6.695)	22.027*** (6.948)	12.553** (6.528)
IFDI	5.072*** (1.572)	-0.191 (1.759)	-1.152 (1.764)	-0.178 (1.806)	-1.278 (1.682)
DS	0.081** (0.036)	0.167*** (0.033)	0.177*** (0.032)	0.175*** (0.033)	0.113*** (0.037)
PGR	-0.232 (1.384)	-2.586** (1.211)	-2.647** (1.153)	-2.083* (1.184)	-1.673 (1.011)
EDUL	1.848 (13.436)	-19.329 (12.671)	-19.775 (12.139)	-21.185* (12.591)	-14.914 (11.176)
RD	16.857*** (3.603)	29.772*** (4.271)	31.345*** (4.172)	34.017*** (4.251)	24.288*** (5.377)
EXPT	1.404** (0.601)	1.671*** (0.521)	1.676*** (0.495)	- -	1.297*** (0.448)
INF	0.965*** (0.111)	0.909*** (0.108)	0.915*** (0.106)	0.811*** (0.105)	0.705*** (0.118)
IND	-0.243	-0.409	-0.452	-0.125	-0.511*

	(0.377)	(0.302)	(0.286)	(0.279)	(0.271)
Observations	153	153	153	153	153
R-squared	0.563	0.722	0.791	0.775	0.853
Hausman Test (p-value)			222.234 (0.000)	152.398 (0.000)	

Note: The symbols *, **, and *** denote statistical significance at the 10%, 5% and 1%, respectively (* $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$).

Table 8. Main empirical results for Western China.

Dependent variable	Domestic investment (DI)				
	Model (16) - OLS	Model (17) – Random-effects	Model (18) – Fixed-effects (main specification)	Model (19) – Fixed-effects (robustness check)	Model (20) – Fixed-effects (GMM)
Intercept	-0.185** (0.081)	-0.185** (0.066)	0.319*** (0.106)	0.306*** (0.105)	-0.295 (0.153)
OFDI	4.582* (2.612)	4.583** (2.104)	2.254 (2.319)	2.673 (2.111)	4.881 (4.369)
IFDI	2.289** (0.723)	2.289*** (0.582)	-0.371 (0.665)	-0.493 (0.657)	0.419 (0.692)
DS	0.172*** (0.027)	0.172*** (0.022)	0.024 (0.034)	0.026 (0.034)	0.179 (0.112)
PGR	-0.565 (1.403)	-0.565 (1.131)	0.995 (1.242)	0.917 (1.242)	2.391* (1.156)
EDUL	53.925*** (8.075)	53.925*** (6.504)	49.144*** (9.685)	50.241*** (9.649)	51.096 (45.817)
RD	-2.398 (2.377)	-2.398 (1.914)	-18.688*** (3.689)	-18.812*** (3.692)	-7.903 (10.473)
EXPT	-0.217 (0.199)	-0.217 (0.161)	-0.213 (0.185)	- -	-0.041 (0.237)
INF	0.597*** (0.052)	0.597*** (0.042)	0.528*** (0.075)	0.521*** (0.075)	0.605*** (0.231)
IND	-0.578** (0.266)	-0.578** (0.214)	-0.339 (0.294)	-0.415 (0.287)	-0.479 (0.499)
Observations	170	170	170	170	170
R-squared	0.742	0.741	0.886	0.886	0.866
Hausman Test (p-value)			95.613 (0.000)	27.047 (0.001)	

Note: The symbols *, **, and *** denote statistical significance at the 10%, 5% and 1%, respectively (* $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$).

To further validate our models, we conduct the robustness check by taking out one explanatory variable, EXPT, in the model specification (See Models (4), (9), (14), and (19)). Our results show the coefficients of OFDI for China ($p < 0.05$), Eastern ($p < 0.05$), and Central China ($p < 0.01$) remain robust, revealing OFDI still has a positive correlation with DI. For Western China, again, the coefficient of OFDI is not statistically significant, demonstrating no significant association between OFDI and DI there.

Apart from performing the traditional panel data regression and robustness check, we employ the GMM procedure to validate our results further. Table 9 presents the results of DI's persistence, serial correlation, and overidentification tests pertinent to GMM. First, as the DI's one-year lagged values are positive and significant at a 1% level at the country and regional levels, they capture the dynamic nature of the model. Second, to detect the existence of second-order serial correlation, we find that no serial correlation problem prevailed as p-values for China and its macro-regions exceeded 5%. Lastly, to test whether the instruments are valid, our results show that the p-values of Hansen J-statistic for China, Eastern China, Central China, and Western China are 0.428, 0.334, 0.457 and 0.279, respectively, which fall between 0.25 and 1.00, implying that the independent variables are valid. We conclude that the independent variables are not associated with the error term and are entirely exogenous. Following this, according to the Models (5), (10) and (15), our result demonstrates that the coefficients of OFDI for China ($p < 0.05$), Eastern China ($p < 0.10$) and Central China ($p < 0.05$) remain statistically significant, showing that OFDI still has a positive relationship with DI in those regions. Concomitantly, based on Model (20), the coefficient of OFDI for Western China ($p > 0.10$) also indicates that OFDI has no association with DI there.

Table 9. DI's persistence, serial correlation, and overidentification test results for China, Eastern China, Central China, and Western China.

Regions/ Tests	DI's persistence		Serial correlation estimation			Overidentification estimation		
	Coefficients	Persistence effect	Coefficients	P-values	Existence of second-order serial correlation	Hansen J-statistic	P-values	Validity of all overidentifying restrictions
China	0.704***	Yes	0.007	0.466	No	10.005	0.428	Yes
Eastern China	0.791***	Yes	0.011	0.414	No	3.548	0.334	Yes
Central China	0.899***	Yes	0.004	0.478	No	1.124	0.457	Yes
Western China	0.545***	Yes	0.008	0.458	No	1.387	0.279	Yes

Note: The symbol *** represents statistical significance at the 1% level. (***) $p < 0.01$.

4.4. Outward FDI motivations and provincial DI

Our survey of multinational enterprises' motivations suggests that most engaged in OFDI to bolster the returns on DI. Table 10 shows the OFDI motivations of the top 100 Chinese multinationals from 2015 to 2018.

Table 10. OFDI motivations of the top 100 Chinese multinational enterprises, 2015-2018.

Year	Nature of companies			OFDI motivations															
	SOE	Non-SOE	Total	Resource-seeking				Efficiency-seeking				Market-seeking				Strategic assets-seeking			
				EC	CC	WC	Total	EC	CC	WC	Total	EC	CC	WC	Total	EC	CC	WC	Total
2015	69	30	99	8	3	1	12	4	6	0	10	59	1	0	60	17	0	0	17
2016	65	35	100	7	2	1	9	3	4	0	7	64	1	0	65	17	0	1	18
2017	66	34	100	5	0	2	7	0	6	0	6	63	1	0	64	23	0	0	23
2018	62	38	100	7	1	2	10	5	4	0	9	57	2	0	59	22	0	0	22
Average	66	34	100	7	1	2	10	3	5	0	8	61	1	0	62	20	0	0	20

Source: Outward Foreign Direct Investment Statistics Bulletin of China, 2015-2017, and Report on Development of China's Outward Investment, 2019. *Notes:* SOE and non-SOE represent state-owned enterprises and non-state-owned enterprises, and EC, CC, and WC denote Eastern China, Central China, and Western China.

According to Table 10, almost 67% of firms operating in eastern Chinese provinces cited their desire to expand into foreign markets as a motivation for investing outside the region. In comparison, 22% claimed to seek strategic assets, such as advanced technology or technical know-how. Only 8% and 3% of companies in the region publicly cited a search for natural resources and lower-cost production as motivation for engaging in OFDI. Multinational enterprises operating in China's eastern coastal regions thus invested outside the region to seek new markets and strategic assets. Our regression results suggest these firms' search for new markets may thus enhance domestic capital formation. Contrasting with previous findings almost two decades ago [23, 24, 25], Chinese multinational enterprises may encourage local investment in their home regions as China enters more free trade agreements and expands abroad. Their

motivation to develop new markets may gradually develop existing ones provincially. Furthermore, OFDI seeks to bring back competencies for exploitation at home. Instead, these firms search for strategic assets outside their home provinces to boost returns globally. Large fixed investments abroad in these strategic assets provide domestic opportunities for resources.

Multinational enterprises operating in other Chinese provinces have different reasons for engaging in OFDI. First, Eastern China's multinational enterprises mainly looked for overseas market expansion and strategic assets. On average, sixty-one Chinese multinationals engaged in market-seeking OFDI, while twenty Chinese MNEs committed to strategic asset-seeking OFDI. Second, MNEs operating in Central China claim to invest outside the province to find ways of making the investment at home more profitable. These five companies, on average, engaged in efficiency-seeking OFDI and sought foreign subsidiaries to guarantee the supply of competitive and strategic inputs and explore new and advanced production methods. Finally, the search for natural resources primarily drove OFDI for two Chinese multinationals in Western China. Contrasted with previous findings [24], resource-seeking OFDI positively impacted DI in these provinces. OFDI sought to promote domestic investment in Eastern and Central China by increasing the productivity of such investment.

5. Conclusion and policy implications

Our study explores the impact of OFDI on DI in China at the national and regional levels. We conduct the panel regression on a dataset covering ODI and DI in 31 Chinese provinces, municipalities, and autonomous regions from 2005 to 2021. We analyse these data at the national level for China's three macro-regions and control for province- and time-specific effects. Our findings suggest that OFDI statistically correlates with DI in China, but the relationship varies by region. OFDI correlates with DI in Eastern and Central China but not Western China. Of the four motivations for engaging in such OFDI (efficiency-seeking, resource-seeking, market-seeking, and strategic asset-seeking), the efficiency-seeking, market-seeking, and strategic asset-seeking ones significantly affect domestic capital formation.

Our findings have significant policy ramifications. Many state-owned enterprises in China's eastern and central provinces play critical roles in investing overseas, stimulating local domestic capital formation. However, for the western part of China, our findings show that simply engaging in more overseas merger and acquisition activities will not necessarily increase investment at home. More DI may not even strengthen local industry or increase profitability at home. Instead, these companies gain their competitive advantage through well-established institutional frameworks, solid state-local relations, and a wealth of financial resources – not from expanding abroad. As different macro-regions have varied exogenous factors, for instance, demands for FDI and manufacturing exports, and endogenous conditions, such as the workers' levels of education and experience, specific OFDI policies promoting DI's synergetic effects should be adopted by local governments.

Most importantly, OFDI can improve DI, particularly in Eastern and Central China. Our findings suggest that government policy should foster business activities between domestic state-owned enterprises and private enterprises. Furthermore, the Chinese government's liberalisation of OFDI rules has the potential to improve domestic investment. Local governments can develop OFDI policies that encourage businesses in their areas to invest in specific strategic industries and local workforce. Specifically, for OFDI policy design, local governments can thoroughly investigate the OFDI motivation embedded in firms. Assume that OFDI is seeking resources as well as strategic assets. In that case, local governments should assist firms in acquiring complementary resources, such as strategic and critical commodities, such as rare earth minerals or well-known overseas brand names, by streamlining the process of approving local overseas investment, causing firms to increase their DI by purchasing new advanced fabrication and processing equipment and hiring experienced staff to improve managerial competencies. Next, if the OFDI seeks efficiency, local governments can offer policy incentives to entice firms to invest locally to improve workers' skills and capabilities, allowing local firms to focus on producing more value-added products. Finally, if local firms seek new markets, the local government can provide tax breaks and rebates and strengthen institutional arrangements with the provincial government to ensure that export regulations are updated in various overseas markets. It can also help firms build more resilient global supply chain networks by implementing significant DI.

Based on these findings, Chinese policymakers could devise new OFDI policies that allow significant regional variations. These policies would maximise the advantages of domestic hierarchical administration while allowing central and local governments to pursue a more balanced regional development within China and its macroregions. On the other hand, they will play an important role in helping outward-investing firms manage tensions arising from Sino-U.S. geopolitical tensions and the post-COVID-19 economic recovery.

Nonetheless, our study has the following limitations: (1) Because of data limitations, we can only examine the regional variations at the provincial level instead of the prefectural level for further detailed analysis; and (2) The existing levels of data aggregation for three macroregions may not reveal any intra-regional differences.

Our study quantitatively analysed the association between OFDI and DI at the country and regional levels. In many countries in the Global South, especially for other BRICS countries, examining the OFDI-DI nexus can help produce the regional economic growth of different provinces through local industry-specific and firm-specific OFDI and DI policies. Future research is needed to investigate how OFDI promotes the synergetic effects of DI using qualitative approaches, such as case studies and interviews with firms' executives and local government officials. This approach may strengthen the theoretical understanding of the existing analytical framework of the OFDI-DI interaction.

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MS0032: “I Think I Would Be Cautious”: National Security Threat Accusations as Negative Signals and Their Impact on Organizational Attractiveness

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“I think I would be cautious”: National security threat accusations as negative signals and their impact on organizational attractiveness

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ABSTRACT

This study investigates the impact of national security threat accusations on organizational attractiveness of multinational enterprises (MNEs) and job seekers' intention to apply for a job. We hypothesize that crises reduce organizational attractiveness and job seekers' job application intention due to emotional, moral, and rational concerns. Our findings largely support our predictions. Our study contributes to IB research by introducing national security threat accusations as an organizational crisis and revealing their impact on MNEs' international management. Our findings also contribute to the burgeoning area of research on the intricate relationship between geopolitics and MNEs' global activities.

Keywords: Geopolitics, Organizational attractiveness, Organizational crises, Recruitment

1. INTRODUCTION

The intensified US-China geopolitical rivalry in recent years seems to have brought a distinctive type of crisis to the forefront: multinational enterprises (MNEs) being accused of posing national security threats to host countries. While a long list of Chinese firms, most notably Huawei, have been accused by the US and other Western countries of posing national security threats to the countries, recently the Chinese government probed US chip manufacturer Micron on “national security” grounds and eventually banned it from key infrastructure in China. This move was widely considered as Beijing's retaliation “against Washington's increasing curbs on Chinese access to semiconductor technology” (Hale, 2023). Although news media outlets have reported instances about MNEs posing threats to national security, there has been very little explicit reference to these

instances as a type of crisis in management and business studies. Consequently, little is known about the impact of national security threat accusations on MNEs' international management. Based on signaling theory (Spencer, 1973), our main hypothesis posits that crises signal unfavourable organizational characteristics, which lead to reduced organizational attractiveness and job seekers' lower intention to apply for a job.

2. THEORY AND HYPOTHESES DEVELOPMENT

National security threat accusations are expected to push stakeholders, including job seekers, to re-evaluate the organization due to the drastic nature of such accusations. When an MNE is accused of posing a national security threat to host countries, it implies to stakeholders that the accused company and its home government are colluding against the host country's national interests through various activities, such as dominating the supply, technology transfer, and engagement in espionage (Moran & Oldenski, 2013). Iqbal et al. (2023) suggest that crises provoke emotional, moral, and rational concerns among organizational stakeholders.

Emotional concerns and anticipated pride. Crises can evoke negative emotions towards organizations (Iqbal et al., 2023), potentially diminishing the pride job seekers might feel. Accusations can undermine a company's perceived independence, casting it as potentially serving the interests of its home government. Consequently, we expect that national security threat accusations will trigger emotional concerns, manifesting as diminished anticipated pride.

Moral concerns and perceived value fit. Moral concerns arise "when a crisis signals value incongruence between an organization and its stakeholders" (Iqbal et al., 2023, p.9). Moral concerns become especially salient during crises. We expect negative reactions from job seekers expressing their moral concerns in terms of their perceived fit between their values and those of the organization accused of posing such threats.

Rational concerns and expected treatment. Organizational crises are expected to prompt job seekers to evaluate the organization's instrumental attributes critically. National security threat accusations could heighten job seekers' concerns about job security, as job seekers might worry that accusations could lead to sanctions and penalties, resulting in reduced business activities or the company's decision to move jobs elsewhere. Taken together, we hypothesize the following:

Hypothesis 1: An organization accused of posing national security threats is less attractive to job seekers, and their job pursuit intentions in this type of organization are lower compared to an organization that is not accused of posing such threats.

Hypothesis 2: The mediating effects of anticipated pride and expected treatment in the relationships between product failure scandal and organizational attractiveness and job pursuit intentions, respectively, are stronger than that of perceived value fit.

State Ownership. Firm ownership can significantly influence stakeholders' perception of the firm. Accusations of national security threats against MNEs are deeply political, often rooted in geopolitics and the power dynamics between states (Lai, 2021). State ownership of an MNE may further exacerbate perceptions of the enterprise acting in the home country's interests, potentially compromising the national security of host nations more severely.

Hypothesis 3: There is a significant interaction between the national security threat accusations and organizational ownership, such that state-owned organizations accused of posing national security threats will be perceived as least attractive and job seekers' will show the lowest job pursuit intentions in this type of organizations.

Hypothesis 4: There is a significant interaction between the national security threat accusations and organizational ownership, such that job seekers will perceive the lowest levels of anticipated pride, perceived value fit, and expected treatment, respectively, in state-owned organizations accused of posing national security threats.

3. OVERVIEW OF STUDIES

We employed a 2x2 between-person research design to manipulate national security threats accusations (an organization was accused vs not accused of posing such threats) and company ownership (state- vs privately-owned). We recruited 208 job seekers to take part in the first experiment aiming to randomly allocate 52 participants to one of four experimental conditions. After the completion of the experiment, we had to exclude nine participants, who provided incomplete data.

We designed the experiment in Qualtrics using a "randomizer" function to get roughly equal number of participants across all conditions. Participants were first asked to read a short news vignette concerning a Chinese company, followed by two manipulation checks' questions to ascertain that our manipulation was valid. Next, all participants answered the same set of questions regarding their willingness to work for this company, including their anticipated pride, perceived value fit, and expected treatment by this company if they worked there.

4. RESULTS

Table 1 shows descriptive statistics and correlations between the studied variables. These results provide initial support to our hypotheses, showing significant negative correlations between accusations of posing national security threats and all three socio-cognitive mechanisms as well as organizational attractiveness and job pursuit intentions. State ownership also showed a consistent pattern of negative correlations with all studied variables. We tested hypotheses 1, 3, and 4 by means of analysis of covariance (see Table 2). Our results confirmed hypothesis 1a showing that organizational attractiveness and job pursuit intentions were significantly lower in organizations accused of posing national security threats compared to those that were not accused of posing such threats. We tested hypothesis 2 using PROCESS macro and following the recommendations by Preacher and Hayes (2008) on testing for multiple mediators simultaneously. Our results showed that all three mechanisms significantly mediated the effect of posing national security threats on job pursuit intentions and organizational attractiveness. In partial support of our hypothesis 2, we found that the indirect effects via anticipated pride were stronger than that of expected treatment for both the job pursuit intentions and organizational attractiveness. However, the indirect effects of posing national security threats on both job pursuit intentions and organizational attractiveness via perceived value fit and expected treatment did not significantly differ. We did not support hypothesis 3 as none of the interaction effects between national security threat accusations and ownership on either organizational attractiveness or job pursuit intentions were significant. However, we found partial support for hypothesis 4 as the interaction effect between posing threats and ownership was statistically significant for anticipated pride. As predicted, the anticipated pride was the lowest amongst state-owned enterprises that were accused of posing national security threats.

5. CONCLUSION

Recent years have seen IB researchers turning their attention to the issue of national security, particularly in light of the intensifying US-China rivalry and discussions on deglobalization and decoupling (Li, Shapiro, Peng, & Ufimtseva, 2022; Luo & Van Assche, 2023; Witt, 2019). Our contribution to IB literature lies in conceptualizing national security threat accusations as a crisis and revealing the psychological impact on job seekers' perceptions of MNEs. Our study shows that MNEs accused of posing national security threats are significantly less attractive to job applicants than those

not facing such accusations. Particularly, our findings provide valuable and novel insights into state ownership of MNEs. Previous research has shown that SOEs often encounter suspicion and disapproval from host governments and societies during internationalization (Cui & Jiang, 2012). Our results highlight the profound effect of state ownership on job seekers' perceptions; SOEs are viewed less favourably, regardless of accusations, and evoke the lowest levels of anticipated pride when accused.

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Table 1

Descriptive Statistics, Reliabilities, and Correlations among Studied Variables in Study 1

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	.62	.49	/													
2. Age	34.64	10.46	-.12+	/												
3. Job seek	1.41	.67	-.03	.22**	/											
4. Work exp	3.20	1.02	-.01	.74**	.04	/										
5. Emp status	.75	.43	.07	.18*	-.27**	.44**	/									
6. Expo China	1.63	.70	-.10	.06	-.11	.12+	.08	/								
7. Inter expo	2.85	1.22	.00	.13+	-.10	.18*	.07	.38**	/							
8. Posing threats	.36	.48	.07	-.03	.05	-.03	-.05	-.04	.07	/						
9. Comp owner	.49	.50	.09	-.13	-.18*	-.06	.04	.03	-.12+	.19**	/					
10. Ant pride	3.26	.99	-.16*	-.11	-.07	-.10	.03	.01	-.06	-.38**	-.16*	.90				
11. Value fit	2.58	.94	-.07	-.09	-.02	-.07	.06	.01	-.05	-.25**	-.30**	.64**	.94			
12. Exp treat	2.70	.74	-.02	-.06	-.04	-.07	.02	-.06	-.13+	-.22**	-.18**	.64**	.66**	.89		
13. Pursuit intent	3.44	.95	-.18**	-.04	.01	-.03	.02	.03	-.03	-.25**	-.17*	.73**	.65**	.61**	.90	
14. Org attract	3.16	1.06	-.16*	-.08	-.03	-.07	.03	.05	-.01	-.30**	-.19**	.79**	.73**	.72**	.87**	.92

Notes. Job seek=length of job seeking (1=less than a year; 2=between a year and two years; 3=for over two years), Work exp=work experience (1= none or less than a year, 2=one to five years, 3=five to ten years, 4=over 10 years), Emp status=employment status (1=employed; 0=unemployed), Expo China=exposure to China, Inter expo=international exposure, Posing threats=company was accused of posing national security threats (vs not), Comp owner=the company was a state-owned enterprise (vs privately-owned), Ant pride=anticipated pride, Value fit=perceived value fit, Exp treat=expected treatment, Pursuit intent=job pursuit intentions, Org attract=organizational attractiveness.

N=199. +*p*<.10, **p*<.05, ***p*<.01

Table 2
Summary of ANCOVA Results

	Posing threats		Ownership				Posing threats X Ownership			
	$M_{yes}(SD)$	$M_{no}(SD)$	F	η_p^2	$M_{state}(SD)$	$M_{private}(SD)$	F	η_p^2	F	η_p^2
Anticipated pride	2.76 (1.01)	3.53 (.86)	25.00**	.11	3.09 (1.07)	3.42 (.87)	4.41*	.02	7.00**	.04
Perceived value fit	2.26 (.97)	2.75 (.87)	7.12**	.04	2.29 (.90)	2.85 (.89)	16.76**	.08	1.62	.01
Expected treatment	2.48 (.75)	2.82 (.71)	5.40*	.03	2.56 (.76)	2.83 (.70)	7.59**	.04	2.76+	.01
Job pursuit intentions	3.13 (.97)	3.62 (.90)	8.53**	.04	3.28 (1.00)	3.60 (.89)	4.10*	.02	1.89	.01
Organizational attractiveness	2.74 (1.07)	3.40 (.97)	13.99**	.07	2.96 (1.11)	3.35 (.97)	4.43*	.02	1.76	.01

Notes. $N=199$. df in all F tests were 1, 198. η_p^2 =partial eta squared. These results are adjusted for gender and international exposure.
+ $p<.10$, * $p<.05$, ** $p<.01$



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MS0033: The Effect of Perceived Product Innovation on Anticipated Regret

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The Effect of Perceived Product Innovation on Anticipated Regret

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Abstract: This study explores how two levels of perceived product innovation affect expectations of regret, and examines the regulatory role of consumer experience and capacity marketing. Three experimental studies have found that: Perceived product innovation has an impact on expected regret through consumer recognition; The better the consumer experience, the weaker the impact of perceived product innovation on expected regret; The moderating effect of consumer experience on expected regret is stronger in high-level perception of product innovation. The research results have enriched the study of the impact mechanism and boundary of perceived product innovation, helping enterprises break through the innovation dilemma faced in marketing practice.

Key Words: perceived product innovation; anticipated regret; consumer experience;

1. Introduction

Although companies have invested lots of funds in product development and innovation, the success rate is still unsatisfactory. The reason is that there are significant differences in marketers' and consumers' awareness of product innovation(Boisvert & Khan, 2022). In reality, consumers' perception of product innovation is also influenced by many factors such as individual consumer characteristics and buying situations(Lou, Zhao, & Hao, 2022). The empirical research on perception of product innovation influence so far still lacks (Yu, Zhou, & Dai, 2018).

But in reality, there is a complex situation where new products that are just improved achieve success, but new products from the expanded new product lines are struggling in marketing.

Based on this, this article distinguishes two common types of product innovation, namely "innovation of new product lines" and "innovation of existing product improvement", and discusses how perception of innovation in these two types of products affects anticipated regret.

2.Literature and framework

2.1 Perceived product innovation and anticipated regret

When a company launches a new product which was highly innovative, the uncertainty of new products perceived by consumers will trigger corresponding emotions of hesitation, doubt and anxiety (Zhang, Li & Shang, 2023). Therefore, this article proposes that perceived product innovativeness has a significant positive impact on consumers' anticipated regret.

This article defines consumer identification as consumers' attitude towards companies' innovative products. Psychologists Osgood and Tannenbaum (1955) believe that when consumers face highly innovative products, if they cannot obtain reliable information to judge whether these products can bring them the expected utility values, they will build up a mental defense towards these innovative products. Therefore, this article proposes the following hypotheses:

Hypothesis 1. Perceived product innovation positively affects anticipated regret. Specifically, the higher the perceived product innovation, the higher the anticipated regret.

Hypothesis 2. Perceived product innovation has a positive impact on anticipated regret through consumer identification.

2.2 Moderating effect of consumer experience

According to the cognitive consistency theory, people often have a dynamic tendency. If their attitudes and opinions conflict with other behaviors, as long as they have perceived, they will spontaneously change their original opinions to keep consistent with the correct logical path (Lindgreen & Wynstra, 2005). After gaining good experience with a new product, consumers will break down their original mental defense and instead tend to support the new product (Anshu, Gaur & Singh, 2022). Therefore, this article proposes the following hypotheses:

Hypothesis 3. Consumer experience moderates the effect of perception of product innovation on anticipated regret.

Hypothesis 3a. : The better the consumer experience, the weaker the impact of perceived product innovation on anticipated regret;

Hypothesis 3b. : The worse the consumer experience, the stronger the impact of perceived product innovation on anticipated regret;

Hypothesis 4. The moderating effect of consumer experience on perceived product innovation and anticipated regret is achieved through consumer identification.

2.3 Moderating effect of capability marketing

Zerbini, Golfetto and Gibbert (2006) define capability marketing as “the tools and processes used by companies to communicate, promote, transfer, and sell capabilities in the industry market.” The cue utilization theory holds that in the impact mechanism of perceived product innovation on consumers' anticipated regret, the companies convey the high-end technology, humanized design, and perfect after-sales services of innovative products to the customers through capability marketing, and guide the consumers to develop a positive attitude towards the products through consumer identification. Therefore, this article proposes the following hypotheses:

Hypothesis 5. Capability marketing will moderate the effect of consumers' perception of product innovation on anticipated regret.

Hypothesis 5a. The higher the level of capability marketing, the weaker the impact of perceived product innovation on consumers' anticipated regret;

Hypothesis 5b. The lower the level of capability marketing, the stronger the impact of perceived product innovation on consumers' anticipated regret;

Hypothesis 6. The moderating effect of capability marketing on perceived product innovation and anticipated regret is achieved through consumer identification.

3.Method and results

3.1 Experiment 1: Mechanism of perception of product innovation on anticipated regret

Single-factor (consumers' perception of product innovation: low level vs. high level) between-subjects factorial design was adopted in the experiment, and perceived product innovation was achieved through experimental manipulation.

(1) Manipulation test: The analysis results of the comprehensive group statistics and independent sample T-test showed that consumers from groups C and D perceived product innovation as significantly higher than those from groups A and B ($M_{\text{high}}=2.5556$, $SD=1.12$; $M_{\text{low}}=1.1864$, $SD=0.087$; $DF=184$, $F=14.211$, $p<0.01$), indicating a significant difference between the means of the two groups of data, that is, the manipulation was successful.

(2) Hypothesis test: ① The regression test results of perceived product innovation on anticipated regret were significant ($c=0.514$, $p<0.01$), indicating that H_1 was true. ② Perception of product innovation significantly reduced consumer identification ($a=-0.705$, $p<0.01$); ③ In the regression analysis of perceived product innovation and consumer identification on anticipated regret, the regression coefficient of consumer identification was significant ($b=-0.779$, $p<0.01$), but the regression coefficient of perceived new product innovation was not significant ($c'=-0.036$, $p>0.05$), in which case there was a full mediation, and H_2 was valid.

3.2 Experiment 2: Moderating effect of consumer experience

In this experiment, the 2 (consumers' perception of product innovation: low level vs. high level) \times 2 (consumer experience: low level vs. high level) between-subjects factorial design was adopted, and consumer experience was achieved through experimental manipulation.

(1) Manipulation test: The perceived product innovation of low-level consumers ($M=0.941$)

was significantly lower than that of high-level ($M=2.752$) ($t=-21.957$, $df=178$, $p<0.01$). Low-level consumer experience ($M=2.7118$) was significantly poorer than high-level ($M=3.947$) ($t=-17.339$, $df=178$, $p<0.01$). It can be seen that perception of product innovation and consumer experience according to the mean value method was successfully manipulated.

(2) Hypothesis testing: The results showed that the interaction effect was significant ($F=9.380$, $p<0.05$), the main effect of consumer experience was significant ($F=64.798$, $p<0.01$), and the main effect of perception of product innovation was also significant ($F=7.857$, $p<0.05$), indicating that H_3 was true.

When consumers perceive low-level product innovation, the estimated psychological mean of anticipated regret for low and high-level consumer experience are 1.875 and 1.271, respectively; When perception of product innovation is at high level, the estimated psychological mean of anticipated regret for low and high-level consumer experience are 2.585 and 1.24, respectively. H_{3a} and H_{3b} are true. The Bootstrap mediation test method shows that the confidence interval of consumers' perception of product innovation on consumer identification (LLCI=-.1347, ULCI=.0033) contains 0, therefore H_4 is not true.

3.3 Experiment 3: Moderating effect of capability marketing

2 (consumers' perception of product innovation: high level vs. low level) \times 2 (capability marketing: high level vs. low level) between-group factorial design was adopted in this experiment. The results showed that consumers' perception of product innovation and capability marketing were successfully manipulated (consumers' perception of product innovation: $M_{low}=1.1167$ vs. $M_{high}=3.4722$, $p<0.01$; capability marketing: $M_{low} = 2.152$ vs. $M_{high} = 4.116$, $p<0.01$).

Hypothesis test: The main effect of FZ consumers' perception of product innovation was

also significant ($F=21.630$, $p<0.01$), but the interaction effect between the two was not significant ($F=1.549$, $p>0.05$), indicating that H_5 was not true. Considering that H_6 is true only if H_5 is true, H_6 is not true.

4. Discussion

In three experiments, it was found that consumers' perception of product innovation affects consumers' anticipated regret through consumer identification. Moreover, consumer experience has a stronger influence on the moderating effect of high-level perceived product innovation on consumers' anticipated regret. This article enriches the research on enterprise innovation from a consumer perspective, and expands the research perspective of perceived product innovation at an enterprise market level, which can explain to a certain extent why innovation cannot bring success to new products.

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MS0034: Can Institutional Adaptation Ensure Survival? A Comparative Study of Family Businesses in South Korea and Taiwan: Samsung and Tatung

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Can Institutional Adaptation Ensure Survival?

A Comparative Study of Family Businesses in South Korea and Taiwan: Samsung and Tatung

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Extended Abstract

This study investigates the critical role of institutional adaptation in ensuring the survival of family businesses, focusing on Samsung Group in South Korea and Tatung Group in Taiwan. It highlights Samsung's proactive and strategic adaptation to institutional changes, ensuring its sustained success, while Tatung's governance failures led to external takeovers and the end of family control. This research underscores the importance of adaptive governance strategies for family businesses in emerging markets with frequent institutional shifts, extending the institutional-based view and providing insights into business longevity in dynamic environments.

Keyword : East Asian Family Firms, External Forces, Strategic Response, Institutional Adaptation

1.Introduction

Family businesses and non-family businesses adopt different strategies in response to institutional changes. This study explores the critical role of institutional adaptation in family business survival, focusing on Samsung Group in South Korea and Tatung Group in Taiwan. Through qualitative case studies, we examine their transitions from relationship-based to rule-based environments, revealing that Samsung's strategic adaptation ensures success, while Tatung's governance failures led to external takeovers and the loss of family control. Our research underscores the importance of adaptive governance strategies, particularly in emerging markets with frequent institutional shifts, supporting

the institution-based view and providing practical insights for family businesses (Hoskisson et al., 2000; Pindado & Requejo, 2015). Understanding how family businesses navigate these institutional landscapes is essential for comprehending their long-term sustainability, especially in emerging markets where institutional volatility is more pronounced (Peng & Jiang, 2010; Reuber, 2016; North, 1990; Scott, 1995)

2. Literature review and research framework

2.1. Family Businesses and Institutional Adaptation in Emerging Markets

Family businesses are a dominant force in emerging markets, with approximately 60% of private-sector companies with revenues over \$1 billion in 2010 being family-owned (Björnberg, Elstrodt, & Pandit, 2014). Their resilience is attributed to deep local industry understanding and strong personal relationships with stakeholders, providing a competitive edge during economic crises. However, succession planning remains a critical challenge, with less than 30% surviving to the third generation due to family feuds and loss of entrepreneurial spirit (Caspar, Dias, & Elstrodt, 2010).

Institutional voids in emerging markets highlight the dual nature of family control, which can either beneficially fill these voids or exploit them (Peng & Jiang, 2010). Institutional reforms significantly impact the governance practices of family-controlled firms, necessitating adaptation to new regulatory landscapes to maintain competitiveness and sustainability. This adaptation involves balancing internal family control with external governance mechanisms, which is crucial for improving firm performance (Lien & Li, 2014; Hoskisson et al., 2000).

Understanding how family businesses navigate these institutional landscapes is essential for comprehending their long-term sustainability. Adaptive governance strategies are vital for the survival and success of family businesses in emerging markets, particularly where institutional shifts are frequent and significant (Hoskisson et al., 2000). This research underscores the importance of effective governance in ensuring the longevity of family businesses amidst dynamic institutional environments (Filatotchev, Lien, & Piesse, 2005; Reuber, 2016).

2.2. Research framework

This study employs qualitative research, integrating Grounded Theory and Case Study methods to analyze Samsung and Tatung's strategic responses and governance structures during their transition from relationship-based to rule-based institutional environments. The research begins with defining questions and objectives, focusing on their responses to institutional changes and their impact on governance and performance. Data is gathered from company reports, financial statements, media reports, government documents, and academic literature.

Using Grounded Theory and ATLAS.ti software, the data analysis involves three stages: open coding to identify key concepts and events, axial coding to group similar concepts into higher-level categories, and selective coding to form a unified theoretical framework. Figure 1 illustrates the process of Grounded Theory Analysis and Case Study. Summaries of the history, strategies, and performance outcomes of both companies under different institutional environments are provided. The governance structures, strategic responses, and performance of Samsung and Tatung are compared, offering insights and recommendations for family businesses facing institutional changes.

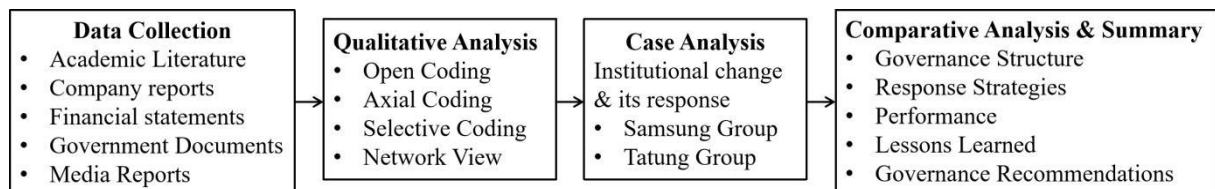


Figure 1. The Process of Grounded Theory Analysis and Case Study

3. Case Studies: Samsung Group in Korea and Tatung Group in Taiwan

Figure 2 illustrates the timeline of significant events and strategic responses of Samsung Group and Tatung Group during their institutional transition. Initially, both operated under relationship-based environments with close business-government ties. Samsung leveraged these connections for rapid growth in South Korea, while Tatung did similarly in Taiwan. Key milestones include their establishment, major financial crises (1997 Asian Financial Crisis), and regulatory changes. Post-crisis,

the environment shifted towards transparency and modern legal frameworks. Samsung adapted through restructuring, increased R&D, and global expansion, maintaining family dominance. Tatung, however, faced ineffective adaptation, leading to reckless expansion, continuous losses, and eventual family exit and external takeover. This timeline highlights the importance of proactive responses to institutional transitions for sustaining family businesses in East Asia.

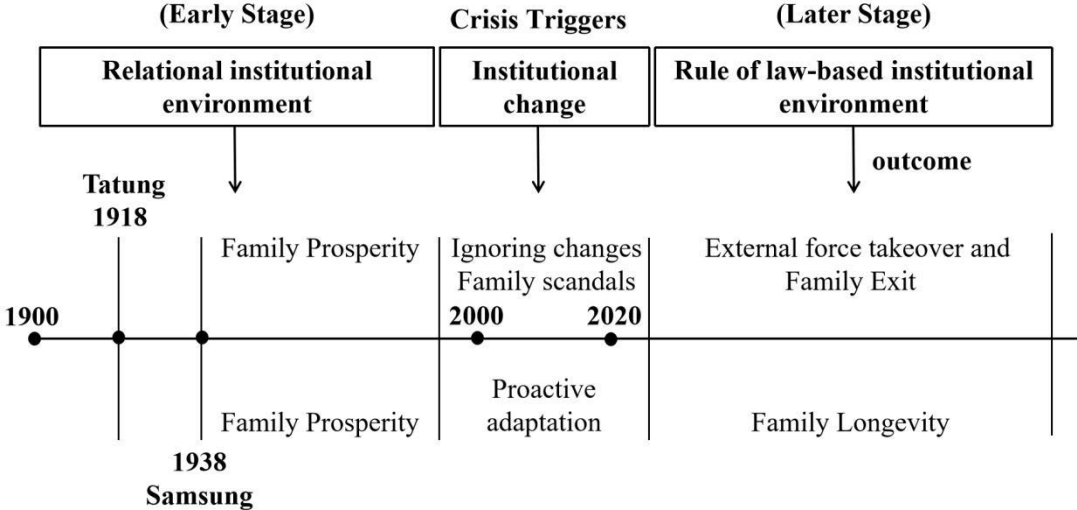


Figure 2. Key Events and Strategic Responses in Samsung and Tatung's Institutional Transition

3.1. A Comparative Case Analysis of Samsung Group and Tatung Group

The comparative analysis of Tatung and Samsung provides critical insights into their strategic responses and governance adaptations during their transition from relationship-based to rule-based institutional environments. Samsung evolved from family-led transformations to structured management changes, maintaining strong policy influence through informal succession plans and implementing corporate governance reforms post-1997 financial crisis. Conversely, Tatung faced governance challenges, losing political connections and encountering internal power struggles, leading to prolonged financial instability. Despite later attempts at restructuring and market expansion through ESG strategies and international cooperation, Tatung faced internal and external challenges.

These observations suggest that strong political and financial ties are crucial for family businesses navigating institutional transitions. They provide essential resources and support, helping companies maintain stability during transformation. Thus, Proposition 1: Strong political and financial connections can help family businesses secure resources and support during institutional transitions,

maintaining stability and enabling growth.

Furthermore, effective succession planning and balancing family control with professional management are vital for the long-term sustainability of family businesses. Samsung's structured management and strategic reforms during crises ensured its market position, while Tatung's response to challenges was comparatively passive. Therefore, Proposition 2: Effective succession planning and balancing family control with professional management contribute to the stability and sustainable development of family businesses during crises.

Finally, close government cooperation and proactive policy engagement are crucial for family businesses in different institutional environments. Government support and collaboration provide necessary policies and resources, enhancing corporate competitiveness in the market. Therefore, Proposition 3: Close cooperation with government agencies and active participation in policy reforms ensure favorable regulatory environments for family businesses and promote market expansion during institutional transitions.

This study underscores the importance of adaptive governance strategies, effective crisis management, and government cooperation for family businesses in dynamic institutional environments.

3.2. Future Research Directions

Future scholars can conduct empirical studies to test the hypotheses proposed in this research and further expand the understanding of governance and strategic adaptation of family businesses in different institutional environments. Cross-regional comparative analyses could explore how family businesses in Europe, North America, and East Asia respond to institutional changes, shedding light on the influence of cultural backgrounds and government policies on business adaptation strategies. Longitudinal studies can track the changes in family businesses over the long term, particularly examining the long-term impact of political transitions on governance structures and strategies. Additionally, the role of technology and innovation is another important direction for future research, investigating how investments in R&D and technological advancements help family businesses maintain competitiveness in changing institutional environments.

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MS0035: The Influence of Junzi on Internal Creating Shared Value Strategy

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The influence of Junzi on internal Creating Shared Value strategy

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The influence of Junzi on internal Creating Shared Value strategy

1. Introduction:

This study examines the integration of Junzi Virtues, derived from Confucian culture, into the business practices of multinational corporations (MNCs) in China, particularly within the framework of Creating Shared Value (CSV) strategies. The increasing recognition of Confucian values as a means to enhance corporate social responsibility (CSR) is highlighted, along with the unique challenges faced by MNCs in the Chinese market. A significant theoretical gap in the literature regarding the application of Junzi Virtues in modern business management is identified, noting that while Confucianism offers a comprehensive philosophical framework, its practical implementation in corporate settings has been limited (Liu & Stening, 2016; Kwong, Cheung & King, 2015). The study aims to validate a new scale for measuring Junzi Virtues and propose a model that illustrates their positive influence on CSV strategies. By linking traditional values with contemporary business practices, this research aspires to provide valuable insights for MNCs navigating the complexities of the Chinese market while promoting sustainable business practices (Snell, Barnes, Wu & Lee, 2024; Poon, Yuen, Chung & Lei, 2021). As globalization progressed, CSR's complexity increased, particularly for multinational corporations, which raised debates about their societal obligations (Matten & Moon, 2008). CSR typically involves voluntary adoption of social and environmental responsibilities, aiming to promote sustainable development and enhance societal well-being while improving corporate reputation (Carroll & Buchholtz, 2009).

2. Theoretical background:

2.1 Corporate social responsibility: Origins and Dilemmas: This section provides a comprehensive theoretical background on Corporate Social Responsibility (CSR) and Creating Shared Value (CSV). It begins with the origins and dilemmas of CSR, tracing its development from the late 19th century, when entrepreneurs like Andrew Carnegie emphasized the societal responsibilities of wealth, to its formalization in the 1970s as businesses began to recognize their social obligations (Carnegie, 1889; Freeman, 1984). The complexity of CSR has increased with globalization,

particularly for multinational corporations, leading to debates about their societal obligations (Matten & Moon, 2008). Despite the recognition of CSR as a vital aspect of business ethics, challenges such as superficial practices and ineffective stakeholder communication persist (Moura-Leite & Padgett, 2012; Fleming & Jones, 2013).

2.2 Creating Shared Value: Meaningful Innovation and the Theory to be filled: The section explores the concept of Creating Shared Value (CSV), introduced by Porter and Kramer (2011), which posits that businesses can generate economic value by addressing social issues. This approach contrasts with traditional CSR by integrating social concerns into corporate strategy, thereby fostering mutual benefits for both society and enterprises (Porter & Kramer, 2011). The theoretical framework of CSV emphasizes the importance of redefining products and markets, improving social and environmental impacts throughout the value chain, and promoting local economic development (Porter & Kramer, 2006).

2.3 Dilemma of Multinational Corporations: The transition process from CSR to CSV: In this part, we discuss the limitations of both CSR and CSV, highlighting the need for a more strategic approach that aligns corporate practices with societal demands (Benabou & Tirole, 2010). This theoretical background sets the stage for understanding the evolving landscape of corporate responsibility and the potential for businesses to contribute positively to society while achieving economic success.

2.4 Junzi Virtues: We explore the concept of Junzi virtues within the context of corporate social responsibility (CSR) and Creating Shared Value (CSV). Rooted in Confucian philosophy, Junzi virtues emphasize moral integrity, ethical leadership, and the pursuit of personal excellence, which are essential for fostering a harmonious society (Liu & Stening, 2016). This section discusses how these virtues can be integrated into modern business practices, particularly for multinational corporations operating in China. The alignment of Junzi virtues with CSV principles offers a framework for companies to navigate the complexities of social responsibility while leveraging local cultural values (Snell et al., 2024).

The application of Junzi virtues in leadership and organizational behavior is highlighted to

enhance the effectiveness of CSV strategies. By cultivating a corporate culture that embodies these virtues, organizations can better engage with local stakeholders and address societal needs, thereby creating shared value (Wu & Snell, 2021). Furthermore, the section identifies the challenges faced by multinational corporations in implementing CSV strategies, such as resource limitations and cross-cultural differences, and suggests that leveraging Junzi virtues can provide a pathway for overcoming these obstacles (Crane, Palazzo, Spence & Matten, 2014; Pfitzer, Bockstette & Stamp, 2013). Ultimately, this exploration of Junzi virtues underscores their relevance in contemporary business ethics and their potential to enrich the discourse on CSR and CSV.

3. Conceptual model and hypotheses:

We present a conceptual model and hypotheses that explore the relationship between Junzi virtues and the implementation of Creating Shared Value (CSV) strategies within multinational corporations. The model posits that Junzi virtues—Ren (仁), Yi (義), Li (禮), Zhi (智), Xin (信),—serve as internal factors that significantly influence the effectiveness of CSV strategies (Prem & Antonio, 2019). By integrating these virtues into corporate practices, organizations can enhance their capacity to address social issues while simultaneously achieving economic objectives.

H1. Junzi Virtues are positively related to the implementation of CSV strategy in branches of multinational enterprises.

H2: Junzi Virtues as internal factors of CSV strategy positively affect the implementation of CSV strategy in branches of multinational enterprises

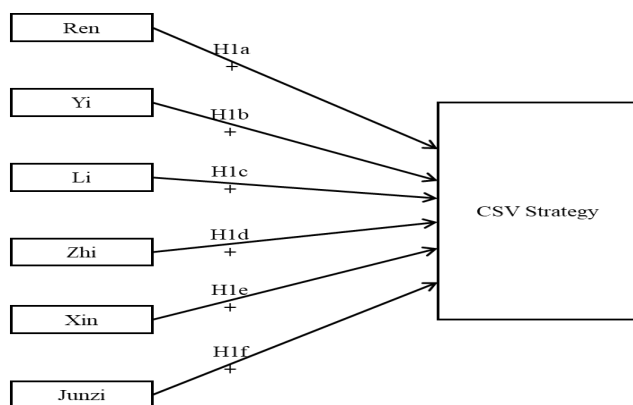


Fig. 1. The conceptual model of Junzi Virtues directly affect CSV Strategy

The section outlines two primary hypotheses: (1) Junzi virtues positively impact the adoption of CSV strategies; (2) specific dimensions of Junzi virtues, such as Visionary Leadership and Cognitive Capabilities, are critical in facilitating this relationship. We try to test this idea below with these two sets of hypotheses: the interaction between these virtues and organizational culture enhances the overall effectiveness of CSV initiatives (Menghwar & Daood, 2021). The proposed model aims to provide a theoretical framework for understanding how traditional Confucian values can be operationalized in contemporary business contexts, thereby offering insights for multinational corporations seeking to navigate the complexities of social responsibility in diverse cultural settings.

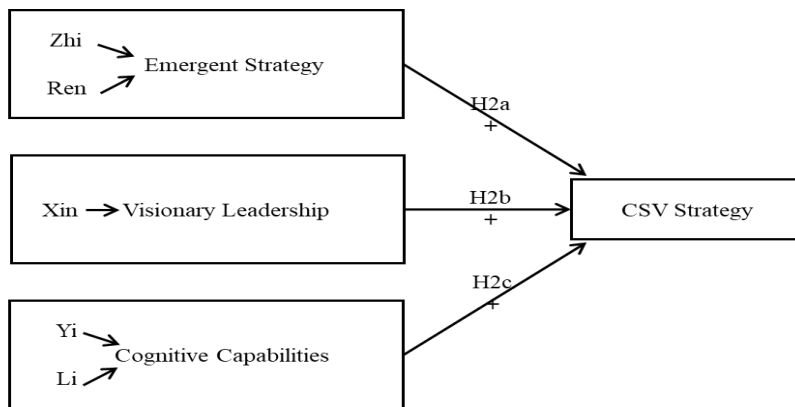


Fig. 2. The conceptual model of Junzi Virtues affect CSV strategy as internal factors

4. Methodology:

This section outlines the methodology employed to investigate the relationship between Junzi virtues and Creating Shared Value (CSV) strategies in multinational corporations operating in China. The study utilizes a quantitative research design, incorporating correlation and regression analyses to validate the proposed hypotheses. A comprehensive questionnaire was developed, integrating the Junzi Virtues scale (Snell et al., 2024) and the CSV scale (Bowen, Zerfass, Stacks & Boyd, 2020), to collect data from a sample of 107 valid responses from employees of an Australian-listed multinational enterprise in China.

5. Findings and Results:

The results revealed a significant positive correlation between Junzi virtues and the effectiveness of CSV strategies, thereby confirming the proposed hypotheses. This analysis indicated that the dimensions of Junzi virtues are integral to enhancing the implementation of CSV initiatives (Prem & Antonio, 2019).

Moreover, the findings highlighted those specific constructs, such as Visionary Leadership and Cognitive Capabilities, serve as critical mediators in the relationship between Junzi virtues and CSV, suggesting that organizations can effectively leverage these virtues to improve their social impact and stakeholder engagement (Menghwar & Daood, 2021). The results contribute to the theoretical framework by demonstrating how traditional Confucian values can be integrated into contemporary business practices, offering empirical support for the role of ethical leadership in fostering sustainable corporate strategies. Overall, this section underscores the practical implications of the findings for multinational corporations aiming to enhance their CSV strategies through the incorporation of Junzi virtues, ultimately promoting a more sustainable and socially responsible business model.

6. Recommendations and Implications:

Emphasizing the significance of Junzi virtues—Ren, Yi, Li, Zhi, and Xin—this section advocates for the development of training programs that foster ethical leadership and a culture of social responsibility within organizations. Establishing partnerships with local stakeholders is also recommended to align CSV initiatives with cultural values, thereby enhancing community trust and stakeholder engagement.

The implications of these findings suggest that multinational corporations can achieve a competitive advantage by adopting a long-term perspective that prioritizes sustainable practices rooted in traditional Confucian values. This approach not only facilitates the effective implementation of CSV strategies but also contributes to the broader goal of sustainable development in the Chinese market.

7. Conclusion:

The research establishes a significant connection between traditional Confucian values and contemporary business practices, demonstrating that Junzi virtues can enhance the effectiveness of CSV initiatives. The findings indicate that integrating these virtues into corporate strategies not only fosters ethical leadership but also aligns business operations with local cultural values, thereby improving stakeholder relationships and community engagement.

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MS0036: Multinational Enterprises' Information Disclosure: An Integrative Review and Future Research

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Multinational Enterprises' Information Disclosure: An Integrative Review and Future Research

Extensive Abstract

Introduction

Information disclosure as a topical area is receiving heightened importance due to stakeholders' demands, the inquiry of transparency under institutional complexity, and the influence of the corporation's rapid digital transformation on disclosing timely information. Information disclosure (ID) is a process of exhibiting facts or information to influence the audience's attitude towards the company (Lev, 1992; Bergh et al., 2019). Multinational enterprises (MNEs) face even larger challenges because expectations from the various groups of stakeholders from different countries enhance the complexity that MNEs have to respond (Shroff et al., 2014; Riaz et al., 2015; Sun et al., 2021).

Indeed, there are an increasing number of studies looking at how MNEs gain legitimacy through information disclosure (Akamah, Hope & Thomas, 2018; Chen, Chen & Hung, 2022; Gu, Wang & Bai, 2024). Studies in the international business, strategy and accounting disciplines are leading the trend of exploring institutional complexity by looking at the information disclosure that MNEs employed in the mid of the 2000s (Bailey et al., 2006; Villiers & Staden, 2006; Capron & Shen, 2007; Westphal & Clement, 2008). Around 2016, there was a burgeoning of international business studies on information disclosure, which generated an era of applying more diverse theoretical scopes from different disciplines (Jeanjean et al., 2015; Aguilera et al., 2017; Hung, Kim & Li, 2018; Pan et al., 2018). Although there are literature reviews targeting institutional complexity provide an observation on information disclosure (Sun et al, 2021) and partly reveal the mechanism (Bergh et al., 2019) and the characteristic of information (Schnackenberg & Tomlinson, 2016), however, there is no literature review systematically map/summarise the topic of MNEs' information disclosure. And we also observe that the nature of information disclosure crosses different disciplines. Therefore, delineating the map of MNE's information disclosure across various disciplines and assessing the approaches of information disclosure can be implicative for international business related studies.

To address this omission, we apply an integrative approach to reassemble the fragmented patterns of MNE’s information disclosure research by reviewing the relevant literature in the period from 1990 to 2024, and developing a relational framework for understanding the richness of MNE’s information disclosure (e.g., content of ID, antecedent of ID, outcome of ID and approaches of ID). Remarkably, we generate an IB-oriented analytical framework for unpacking the institutional complexity of MNE’s information disclosure adapting from Sun et al (2021)’s work. Based on our studies, we adjust the category of the studies in the international context by exploring the influence of transnational institutions. Specifically, we exhibit the current trend of MNE’s information disclosure, contribution and future directions of ID research across various disciplines.

Methodology

This study aims to investigate how MNEs strategically disclose information. ID is a less investigated topical area, which requires a literature review to unpack how firms’ ID strategy could navigate various stakeholders’ expectations and institutional complexity. In order to respond to the inquiry, I observe the nature of ID across various disciplines, and I provide an integrative literature review to delineate the characteristics of ID, the approaches of ID, the antecedent and outcome of ID, and how ID is perceived in the context of institutional complexity.

Table 1. Overview of thesis

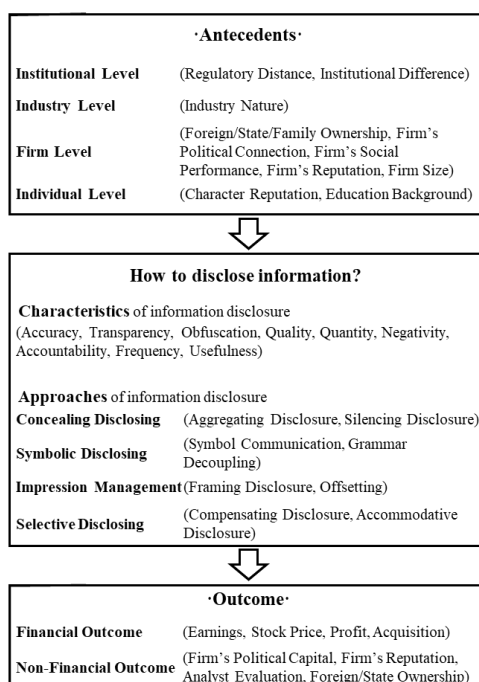
Title	Gap	Research questions	Research design	Main contributions
Multinational Enterprises’ Information Disclosure: An Integrative Review and Future Research	In the current literature on information disclosure, there is no literature review systematically maps the topic of MNEs’ information disclosure to consolidate the fragmented research more broadly across various disciplines in IB field	<ol style="list-style-type: none"> 1. How do MNEs apply different approaches of ID to strategically navigate institutional complexity and various stakeholder’s expectations? 2. What are the antecedents and outcomes of MNE’s information disclosure? 	Integrative literature review	This integrative review consolidates the fragmented literature across various disciplines on information disclosure in IB field and provides the map of the characteristics, approaches, antecedents and outcomes of MNE’s information disclosure, and highlighting the strategic use of ID to address institutional complexity and various stakeholders’ expectations.

Our review offers a chronological snapshot of the 'Multinational enterprises' information disclosure strategy' from 1990 to 2024, focusing on top Financial Times 50 journals (Fassin, 2021; Arregle et al., 2023; Klarin & Suseno, 2023) and leading international business journals like Journal of World Business, Global Strategy Journal, International Business Review, Journal of International Management, and Management International Review (Sun et al., 2021). I exclude the 173 irrelevant articles out of 279 articles by adhering to these two standards: firstly, papers do not focus on the corporation's ID. In total, 102 journals are identified.

Findings & Analysis

Our findings provide key points and the typical categories of reviewed literature for the in-depth review and analysis in the following sections. I structure this section as results by year and journal, results by theme, results by country, results by ID channel, and results by theory. This exhibition demonstrates the close relationship between ID and the international business field, as well as the integrative use of ID across various disciplines in improving diversity. In Figure 1 the relationship framework indicates the characteristic, antecedent, and outcome of ID and the approaches of ID align with our literature. It exhibits the current literature on how to explore ID and what aspects should be focused on.

Figure 1. The relationship framework of ID



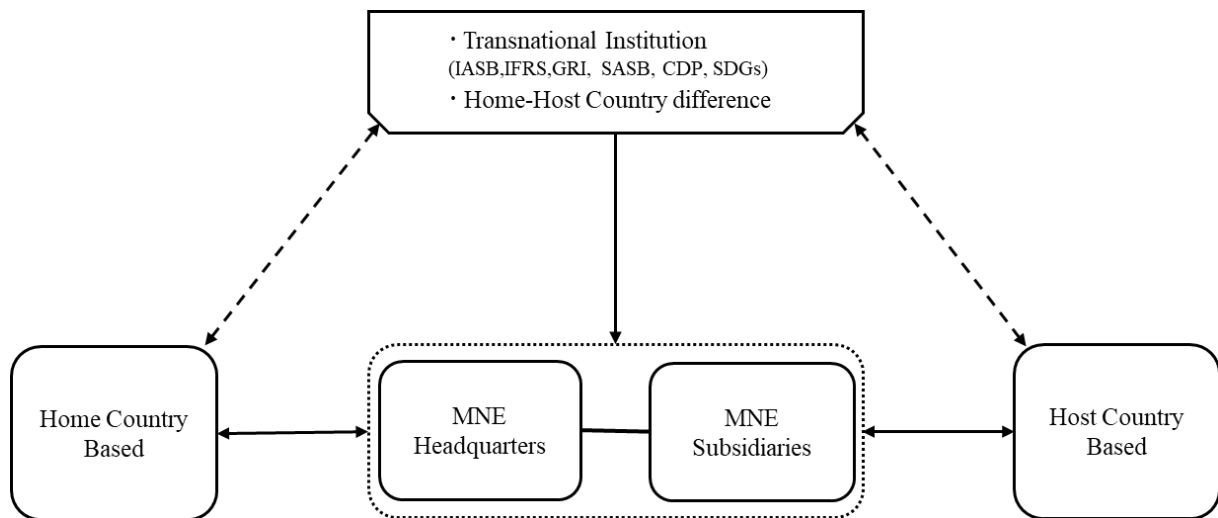
I first concentrate on how MNEs, focusing on different characteristics of ID (e.g., consistency, quality, transparency, accuracy), apply various approaches of disclosing information (e.g., concealing disclosure, symbolic disclosure, impression management and selective disclosure) to strategically disclose information.

Secondly, I adopt a multilevel framework to summarise the antecedents on firms' ID decision or behaviour. More specifically, I look at institutional, industry, firm, and individual levels' factors.

Thirdly, the outcome of ID typically focuses on the financial outcome (e.g. profit, earnings, tax, stock price) and non-financial outcome of the ID (e.g., political capital, intellectual capital, analyst evaluation).

In Figure 2, the institutional framework emphasises the heterogeneity of ID studies in the international business field by cross analysing the home country, host country based studies, home-host country difference studies and the transnational institution studies, which enrich the ID topical area.

Figure 2. The institutional framework of ID



Discussion & Contribution

As ID is a topical area that consists of papers from several disciplines with multiple levels of analysis, we expect increasing attention from three academic communities. First, we attempt to provide IB community with insights to engage scholars who are interested in how MNEs leverage information disclosure to strategically respond to various stakeholders. IB studies, obviously, have a salient fact that international business elements (e.g., ownership, different institutional regulation,

headquarter-subsidary control) constantly have an impact on information disclosure such as, language difference (Cho et al., 2010; Jeanjean et al., 2015), firm's foreign shareholder (Aguilera et al., 2017) and regulatory distance (Shroff et al., 2014). Nonetheless, we not only focus on the firm level and institutional level drivers but also we advice that more attention should be relocated to the industry and individual levels. Regarding the outcome, we recognise the financial outcomes of MNE's information disclosure (e.g., stock price, earnings) and further recommend to place more emphasis on the non-financial outcome of information disclosure such as the firm's political capital (Li et al., 2024) and emotional linguistic (Koszegi, 2006). Importantly, the approaches of information disclosure for strategic disclosing is the ignorance of the current ID area. We based on our literature make a categorisation for understanding the essential role of ID, which includes concealing disclosure, symbolic disclosure, selective disclosure and impression management. Regarding the complexity of the environment in global, our review helps scholars be aware of the extensive applicability of ID in international business related studies (Jeanjean et al., 2015; Bergh et al., 2019).

Second, we contribute to the institutional community not only on the traditional host and home country based fields but also on the transnational institutional and home-host country difference fields, which could enhance the insight of information disclosure in the institutional complexity IB studies. The host country based studies and home country based studies involve the frequently applied international business elements (e.g., foreign/state ownership control (Cannizzaro & Weiner, 2015; Cannizzaro & Weiner, 2018), regulatory environment (Kross & Suk, 2012)). Typical insights in the home-host country difference studies include the regulatory distance (Chen, Chen & Hung, 2022) and institutional difference (Simone & Olbert, 2022; Corciolani et al., 2024). Regarding the institutional complexity, we also generate a category of transnational institutions to understand how the initiative and regulations all over the world that country voluntarily join to follow the principles to disclose the information. Importantly, we distinguish the difference between supranational actors (e.g., European Union, North Atlantic Treaty Organization) and transnational institutions (e.g., Global Reporting Initiative, Carbon Disclosure Project), that the former requires possession of the authority overriding national decisions, while the latter does not. This setting has an

intensive impact on how MNEs react to the regulation to strategically disclose mandatory information and voluntary information ((Jira & Toffel, 2013; Sethi et al., 2017; Flammer et al., 2021). Furthermore, our review leverages the ID relational framework of this study to cross-analyse the features of host-based, home-based, home-host difference and transnational institution studies. This integration of information disclosure and IB tension set up the essentiality of managing institutional complexity by adopting information disclosure strategy.

Finally, through the integrative review, we advocate scholars from a broader business studies related community should value the cross-discipline nature of information disclosure, which could spotlight the underexplored area to bridge conversations in more diverse trending contexts such as digitalisation and geopolitical tensions. We also discover the increasing importance of linguistic and communication theories in enriching the soil of information disclosure, which could be regarded as a sign of employing non-business studies.

In this literature review, we provide a methodology section consisting of the review method, sampling method and review process. The review result is the next section which includes the number of papers by journal/year, information channels, major themes, country/region and theoretical perspective. Then, we build up the relational framework by looking at the content of ID, the antecedent of ID, outcome of ID and approaches of ID in MNEs studies. Thoroughly, we generate an IB-oriented analytical framework to further explore how MNE's employ information disclosure to unpack the institutional complexity with strategic scope by cross-analysing the relational framework. In these two framework sections we both apply citation analysis to navigate discussions about the promising contributions, research gaps and topical areas. Finally, we conclude the insights and suggest future research directions by comparing the use of information disclosure in business studies and other non-business disciplines.

Keywords: Information Disclosure, Multinational Enterprise, Linguistic Framing, Information Asymmetry, Impression Management, Stakeholder Management, Rhetorical

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Appendix 1 Full List of Papers

Sequence	Journa l	Year	Author	Paper
1	MS	2010	Arya et al., 2010	Discretionary disclosure of proprietary information in a multisegment firm
2	JOM	2019	Matta et al., 2019	Managers' perception on factors impacting environmental disclosure
3	JIBS	2018	Hung, Kim & Li, 2018	Political connections and voluntary disclosure: Evidence from around the world
4	MS	2022	Wang, Yu & Zhang, 2023	Panda Games: Corporate disclosure in the eclipse of search

5	MS	2022	Heinle, Samuels & Taylor, 2023	Disclosure substitution
6	SMJ	2007	Capron & Shen, 2007	Acquisitions of private vs. public firms: Private information, target selection, and acquirer returns
7	JIBS	2019	Contractor, 2019	Can a firm find the balance between openness and secrecy? Towards a theory of an optimum level of disclosure
8	SMJ	2021	Flammer et al., 2021	Shareholder activism and firms' voluntary disclosure of climate change risks
9	SMJ	2012	Pacheco & Zemsky, 2012	Some like it free: innovators' strategic use of disclosure to slow down competition
10	SMJ	2023	Zhang, Branstetter & Conti, 2023	Who gains and who loses from more information in technology markets? Evidence from the sunshine act
11	SMJ	2009	Reid & Toffel, 2009	Responding to public and private politics: corporate disclosure of climate change strategies
12	AMJ	2012	Brenner & Ranganathan, 2012	Offsetting illegitimacy? How pressures from securities analysts influence incumbents in the face of new technologies
13	SMJ	2014	Lewis et al., 2014	Research notes and commentaries difference in degrees: CEO characteristics and firm environmental disclosure
14	SMJ	2011	Graffin et al., 2011	What's all that (strategic) noise? Anticipatory impression management in CEO succession
15	AMJ	2010	Pfarrer et al., 2010	A tale of two assets: the effects of firm reputation and celebrity on earnings surprises and investors' reactions

16	AMJ	2008	Westphal & Clement, 2008	Sociopolitical dynamics in relations between top managers and security analysts: favor rendering, reciprocity, and analyst stock recommendations
17	AMJ	2018	Konig et al., 2018	Silver bullet or ricochet? CEOs' use of metaphorical communication and infomediaries' evaluations
18	SMJ	2018	Pan et al., 2018	Give it to us straight (most of the time): top managers' use of concrete language and its effect on investor reactions
19	SMJ	2020	Lee, 2020	Corporate social responsibility of U.S.-listed firms headquartered in tax havens
20	SMJ	2020	Heavey et al., 2020	How do strategic leaders engage with social media? A theoretical framework for research and practice
21	AMJ	2016	Graffin et al., 2016	Ready, aim, acquire: impression offsetting and acquisitions
22	SMJ	2021	Bundy et al., 2021	Reputations in flux: how a firm defends its multiple reputations in response to different violations
23	JMS	2024	Li et al., 2024	Have a go or lay low? Predicting firms' rhetorical commitment versus avoidance in response to polyolithic governmental pressures
24	SMJ	2024	Parker et al., 2024	Accentuate the positive? Strategic negativity amid the hazard of high expectations
25	JBE	2008	Wanderly et al., 2008	CSR information disclosure on the web: a context-based approach analysing the influence of country of origin and industry sector
26	JBE	2017	Sethi et al., 2017	Enhancing the role and effectiveness of corporate social responsibility (CSR) reports: the missing element of content verification and integrity assurance author(s)

27	JBE	2009	Gaa, 2009	Corporate governance and the responsibility of the board of directors for strategic financial reporting
28	JBE	2007	Jose & Lee, 2007	Environmental reporting of global corporations: a content analysis based on website disclosures? Springer 2006
29	JIBS	2022	Chen, Chen & Hung, 2022	Uneven regulatory playing field and bank transparency abroad
30	JWB	2015	Riaz et al., 2015	Disclosure practices of foreign and domestic firms in Australia
31	JIBS	2018	Akamah, Hope and Thomas 2018	Tax havens and disclosure aggregation
32	SMJ	2016	Whittington, Douglas & Ahn 2016	Cheap talk? Strategy presentations as a form of chief executive officer impression management,
33	SMJ	2017	Busenbark et al. 2017	Foreshadowing as impression management: illuminating the path for security analyst
34	JIBS	2017	Aguilera et al. 2017	The governance impact of a changing investor landscape
35	JIBS	2011	Hope et al., 2011	Financial credibility, ownership, and financing constraints in private firms
36	JIBS	1993	Ahadiat 1993	Geographic segment disclosure and the predictive ability of the earnings data
37	JIBS	1990	Gray et al 1990	State ownership and transparency in foreign direct investment
38	JIBS	2018	Cannizzaro & Weiner 2018	State ownership and transparency in foreign direct investment
39	JIBS	2015	Jeanjean et al. 2015	International evidence on the impact of adopting English as an external reporting language
40	JIBS	2011	Brenner 2011	Self-disclosure at international cartel
41	JIBS	1995	Gary et al. 1995	Factors influencing voluntary annual report disclosures by U.S., U.K. and Continental European multinational corporations

42	JIBS	2009	Hope et al., 2009	The effects of SFAS 131 geographic segment disclosures by U.S. multinational companies on the valuation of foreign earnings
43	RP	2022	Matthews et al., 2022	Paradoxical transparency? Capital market responses to exploration and exploitation disclosure
44	RP	2023	Kong et al., 2023	Linguistic metrics for patent disclosure: evidence from university versus corporate patents ☆
45	MIT SMR	2003	Hayashi, 2003	Hr information disclosure
46	MIT SMR	2006	Hannah, 2006	Keeping trade secrets secret
47	JWB	1999	Sullivan, 1999	What are the functions of corporate home pages?
48	MSOM	2013	Jira & Toffel, 2013	Engaging supply chains in climate change
49	JOM	2019	Bergh et al., 2019	Information asymmetry in management research: past accomplishments and future opportunities
50	OS	2019	Fabrizio & Kim, 2019	Reluctant disclosure and transparency: evidence from environmental disclosures
51	MIT SMR	2008	Pirson & Malhotra, 2008	Unconventional insights for managing stakeholder trust
52	JOM	2022	Wang et al., 2022	Social performance feedback and firm communication strategy
53	MISQ	2010	Gordon et al., 2010	Market value of voluntary disclosures concerning information security
54	JOM	2016	Schnackenberg & Tomlinson, 2016	Organizational transparency: a new perspective on managing trust in organization-stakeholder relationships
55	ASQ	2018	Carlos & Lewis, 2018	Strategic silence: withholding certification status as a hypocrisy avoidance tactic
56	AMJ	2017	Hayward & Fitza, 2017	Pseudo-precision? Precise forecasts and impression management in managerial earnings forecasts
57	AMJ	1994	Abrahamson & Park, 1994	Organizational outcomes: an agency theory perspective

58	AMJ	2017	Luo et al., 2017	Whose call to answer: institutional complexity and firms' CSR reporting
59	SEJ	2021	Howard et al., 2021	Entrepreneurial identity and strategic disclosure: Founder CEOs and new venture media strategy
60	SEJ	2021	Mohammadi & Khashabi, 2021	Patent disclosure and venture financing: the impact of the American Inventor's Protection Act on corporate venture capital investments
61	JIBS	2022	Liao et al., 2022	Transporting transparency: Director foreign experience and corporate information environment
62	JIBS	2024	Carney & Dieleman, 2024	See who I know! Addressing the liabilities of outsidership through status signalling
63	JIBS	2012	Shi et al., 2012	Do countries matter for voluntary disclosure? Evidence from cross-listed firms in the us
64	JIBS	2024	Gu, Wang & Bai, 2024	Revealed and reserved: a compensating approach of voluntary disclosure by family multinationals
65	JIBS	2019	Wang & Li, 2019	Responding to public disclosure of corporate social irresponsibility in host countries: information control and ownership control
66	MOR	2024	Yue et al., 2024	Firms' rhetorical nationalism: theory, measurement, and evidence from a computational analysis of Chinese public firms
67	JIBS	2024	Wang et al., 2024	Smart disclosure: an enabler for multinationals to reduce human rights violations in global supply chains

68	AMJ	2016	Crilly et al., 2016	The grammar of decoupling: a cognitive-linguistic perspective on firms' sustainability claims and stakeholders' interpretation
69	JIBS	2023	Hornikx et al., 2024	Foreign languages in advertising: theoretical implications for language-related IB research
70	JMS	2024	Corciolani et al., 2024	Lost and found in translation: how firms use Anisomorphism to manage the institutional complexity of CSR
71	JFE	2006	Bailey et al., 2006	The economic consequences of increased disclosure: evidence from international cross-listings
72	JFQA	1997	Anderson & Lee, 1997	Ownership studies: the data source does matter
73	JFE	2022	Bond & Zeng, 2022	Silence is safest: information disclosure when the audience's preferences are uncertain
74	JFQA	2014	Chen et al., 2014	Transparency and financing choices of family firms
75	QJE	2006	Koszegi, 2006	Emotional agency
76	JF	1990	John & Mishra, 1990	Information content of insider trading around
77	JAR	2020	Lisowski & Minnis, 2020	The silent majority: private U.S. Firms and financial reporting choices
78	AOS	2015	Cannizzaro & Weiner, 2015	Multinational investment and voluntary disclosure: project-level evidence from the petroleum industry
79	AOS	2010	Cho et al., 2010	The language of US corporate environmental disclosure
80	AOS	2006	Villiers & Staden, 2006	Can less environmental disclosure have a legitimising effect? Evidence from Africa
81	AOS	2018	Islam & Staden, 2018	Accounting, organizations and society

82	AOS	1992	Patten, 1992	Printed in Great Britain Pergamon Press Ltd intra-industry environmental disclosures in response to the Alaskan oil spill: a note on legitimacy theory
83	JAE	2012	Kross & Suk, 2012	Does regulation FD work? Evidence from analysts' reliance on public disclosure
84	JAR	1990	Gibbins et al., 1990	The management of corporate financial disclosure: opportunism, ritualism, policies, and processes
85	CAR	2020	Burke et al., 2020	The use and characteristics of foreign component auditors in U.S. multinational audits: insights from form AP disclosures
86	CAR	2021	He et al., 2021	Does the threat of a PCAOB inspection mitigate US institutional investors' home bias?
87	JAR	2003	Young & Guenther, 2003	Financial reporting environmental and international capital mobility
88	RAS	2015	Florou & Kosi, 2015	Does mandatory IFRS adoption facilitate debt financing?
89	TAR	2014	Lundholm et al., 2014	Restoring the tower of babel: how foreign firms communicate with U.S. Investors
90	TAR	1996	Bartov & Bodnar, 1996	Alternative accounting methods, information asymmetry and liquidity: theory and evidence
91	TAR	2022	Simone & Olbert, 2022	Real effects of private country-by-country disclosure
92	TAR	2014	Shroff et al., 2014	Information environment and the investment decisions of multinational corporations
93	IBR	2006	Aljifri, K., & Khasharmeh, H. 2006.	An investigation into the suitability of the international accounting standards to the United Arab Emirates environment
94	IBR	2015	Cuadrado-Ballesteros, B., Rodríguez-Ariza, L., & García-Sánchez, I. M. 2015.	The role of independent directors at family firms in relation to corporate social responsibility disclosures

95	IBR	2010	Guillamon-Saorin, E., & Sousa, C. M. 2010.	Press release disclosures in Spain and the UK
96	IBR	2013	García-Sánchez, I. M., Rodríguez-Ariza, L., & Frías-Aceituno, J. V. 2013.	The cultural system and integrated reporting
97	IBR	2015	Abdioglu, N., Bamiatzi, V., Cavusgil, S. T., Khurshed, A., & Stathopoulos, K. 2015.	Information asymmetry, disclosure and foreign institutional investment: an empirical investigation of the impact of the Sarbanes Oxley act
98	IBR	2019	García-Sánchez, I. M., Suárez-Fernández, O., & Martínez-Ferrero, J. 2019.	Female directors and impression management in sustainability reporting
99	IBR	2017	Cuadrado-Ballesteros, B., Martínez-Ferrero, J., & García-Sánchez, I. M. 2017.	Mitigating information asymmetry through sustainability assurance: the role of accountants and levels of assurance
100	IBR	2008	Keasey, K., & McGuinness, P. B. 2008.	Firm value and its relation to equity retention levels, forecast earnings disclosures and underpricing in initial public offerings in Hong Kong
101	IBR	2022	Mariappanadar, S., Maurer, I., Kramar, R., & Muller-Camen, M. 2022.	Is it a sententious claim an examination of the quality of occupational health, safety and well-being disclosures in global reporting initiative reports across industries and countries
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MS0037: Blockchain-driven Supply Chain Resilience and Performance from Relational and Dynamic Capability Perspectives: A Multiple Sequential Mediation Model

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Blockchain-driven Supply Chain Resilience and Performance from Relational and Dynamic Capability Perspectives: A Multiple Sequential Mediation Model

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Extended Abstract

This study explores how blockchain technology influences supply chain resilience and relational performance. By integrating the relational perspective and dynamic capability theory, this study presents a theoretical model demonstrating how blockchain technology promotes supply chain resilience by enhancing relational trust and network capabilities. The study concludes that blockchain technology is crucial in reducing transaction costs and conflicts, thereby improving relationship performance. Its transparency and immutability establish greater trust among supply chain partners, enhancing information sharing and cooperation.

Keyword: Blockchain adoption, Supply chain relationship, Supply Chain Resilience, Relationship performance.

1. Introduction

The complexity and fragmentation of supply chains pose challenges for information sharing, collaboration, and trust-building (Xue et al., 2021). Supply chain disruption and scarcity of raw materials have affected capacity and supply (Paul & Chowdhury, 2021). These disruptions highlight the disadvantages operations face when dealing with unforeseen events, emphasizing the need to enhance supply chain resilience. However, blockchain has emerged as a promising solution, with the potential to revolutionize management practices and address these challenges, inspiring a new wave of hope in the industry (Dutta et al., 2020). Its decentralized and immutable ledger provides a secure and transparent platform for transactions, data sharing, and smart contract execution (Li et al., 2023; Xue et al., 2021).

Establishing effective supply chain relationships is crucial for enhancing performance. Existing literature, i.e., (Bai et al., 2024; Partanen et al., 2020) suggests that relational trust and network capability are critical dimensions for enhancing organizational performance. In fact, relational trust entails the establishment of mutual trust among supply chain partners based on past interactions and transaction records (Bai et al., 2024). Thus, trust is a crucial dimension of supply chain relationships, helping reduce transaction costs and conflicts, while also increasing cooperation. On the other hand, network capability refers to the ability of supply chain parties to exchange information, share resources, and coordinate effectively (Arasti et al., 2022). A strong network capability promotes close cooperation and coordination among supply chains, ultimately improving overall performance and resilience.

Several studies discuss the impact of emerging technologies on supply chain relationships (Chen et al., 2023). However, there is still a lack of empirical evidence on the role of the relationship between supply chain organizations in a blockchain environment. Additionally, previous studies have considered supply chain resilience from multiple perspectives, such as economic (Juan & Li, 2023) and environmental (Junaid et al., 2023). However, in the blockchain context, relationships between supply chain members have changed, and few scholars have conducted detailed research on relationship performance.

Having identified the research objectives and prominent gaps, this study aims to: (1) How can blockchain technology influence supply chain resilience, ultimately affecting its relationship performance? (2) Does relational trust and network capability mediate the relationship between blockchain technology and supply chain resilience?

Moreover, this study aims to fill the gap by proposing a multiple sequential mediation model to explain the relationship between blockchain adoption and relationship performance, drawing upon the relationship view and the dynamic capabilities theory. By combining the two theories, this study provides a comprehensive framework for explaining the impact of blockchain on supply chain resilience and relational performance. The relational perspective emphasizes the value of inter-firm collaboration and relationship-specific assets. At the same time, the dynamic capability theory focuses on the firms' ability to reconfigure resources to meet challenges in a rapidly changing environment.

2. Theoretical Background

2.1. The Relational View

The relational view was developed by Dyer and Singh (1998) to explain how inter-firm collaboration and relationship-specific assets contribute to competitive advantage. The theory suggests that a firm's competitive advantage stems from both its internal resources and capabilities and its cooperative relationships and networks with other firms (Dyer & Singh, 1998). Core concepts of the relational view include relationship-specific assets, complementary resources and capabilities, knowledge-sharing routines, and effective governance mechanisms (Dyer & Singh, 1998; Dyer et al., 2018).

Relationship-specific assets are resources invested in a partnership to deepen bonds between partners and increase their willingness to collaborate (Jia, 2013). Complementary resources and capabilities enable firms to improve performance by integrating resources and capabilities that individual firms cannot achieve alone. Knowledge-sharing routines are systematic mechanisms for exchanging information and knowledge, fostering innovation and efficiency gains among partners (Castaneda &

Cuellar, 2020). Effective governance mechanisms, such as formal contracts and informal trust, clarify responsibilities and reduce transaction costs and uncertainty (Dyer et al., 2018).

The relational view effectively explains how blockchain facilitates cooperation and trust in supply chains. Blockchain, a relationship-specific asset, enhances trust among partners through its transparent and immutable nature, enabling information sharing and resource integration (Tian & Hu, 2023).

2.2. Dynamic Capabilities Theory

Dynamic capabilities theory, proposed by Teece et al. (1997), explains how firms maintain a competitive advantage by reconfiguring resources and capabilities in rapidly changing environments. As suggested by Hodgkinson & Healey (2011), the processes of sensing, seizing, and transforming in dynamic capabilities theory are crucial for maintaining a competitive advantage in dynamic environments. Sensing is a firm's ability to identify and assess market opportunities and threats (Teece, 2007). This process requires strong market insights and information analysis capabilities. Seizing is a firm's ability to integrate and mobilize resources to capture market opportunities (Endres et al., 2020). Firms need flexibility in their organizational structure and management practices to adjust resource allocation quickly. Transforming the firm's ability to adjust its strategy and operations in response to market changes and technological advances (Li et al., 2021).

Dynamic capabilities theory has been widely expanded in different fields. For example, Eisenhardt and Martin (2000) point out that dynamic capabilities may manifest differently in various market environments. As a new digital tool, blockchain technology provides a fresh research direction for dynamic capabilities theory. It enables companies to integrate and mobilize resources more effectively, enhancing competitive advantages in rapidly changing environments.

3. Proposition Development

3.1. Impacts of Blockchain on Supply Chain Resilience

Fundamental characteristics of blockchain include decentralization, smart contracts, immutability and transparency (Upadhyay, 2020). Studies have concluded that blockchain enhances the efficiency of supply chain processes. This improvement primarily results from increased transparency and traceability (Biswas et al., 2023). Blockchain is argued to improve data security due to its decentralized structure. This feature can also help establish network relationships (Brookbanks & Parry, 2022). Supply chain partners can promptly receive vital and accurate data, enabling them to schedule operations effectively (Lee et al., 2021). The immutability of blockchain data acts as a safeguard, protecting it against falsification (Bendiab et al., 2023). The timely and automatic recording of data in blockchain helps managers respond swiftly and takes necessary actions. This enhances stable operations against external risks (Helo & Shamsuzzoha, 2020).

By facilitating efficient and swift data transmission, blockchain allows the supply chain to adapt to market changes with flexibility data efficient and swift transmission, blockchain allows the supply chain to adapt with flexibility to market changes. Blockchain's smart contracts streamline interaction among supply chain partners, thereby speeding up the decision-making and carried out across the entire supply chain network (De Giovanni, 2020). This leads to enhanced strategic flexibility and responsiveness to the ever-changing market conditions (Kimani et al., 2020). Hence, this leads to the following proposition.

P1: Blockchain adoption is positively related to supply chain resilience.

3.2. The Mediating Effects of Supply Chain Relationship

In supply chain management, relational trust is widely recognized as crucial for enhancing resilience. Research shows that trust strengthens cooperative relationships among supply chain partners, reduces transaction costs, and increases their willingness to share information (Casidy & Yan, 2022; Morgan & Hunt, 1994). Blockchain enhances trust among supply chain partners through its transparency and immutability. For example, blockchain provides a transparent platform where all participants can view the complete transaction history, reducing information asymmetry and enhancing trust (Centobelli et al.,

2022; Li et al., 2023). Blockchain ensures the immutability of transaction records, further strengthening the foundation of trust (Centobelli et al., 2022). Hence, this leads to the following proposition.

P2: Blockchain adoption promotes supply chain resilience through relational trust.

Network capability emphasizes the ability of supply chain partners to exchange information, share resources, and coordinate effectively (Partanen et al., 2020). Research indicates that blockchain technology significantly enhances supply chain network capacity through its decentralized information-sharing mechanism (Yin & Ran, 2021). Blockchain provides a secure, transparent, real-time platform that enables supply chain partners to collaborate more efficiently (Jiang et al., 2022). For instance, supply chain members can share inventory and logistics data in real-time via blockchain, optimizing resource utilization and improving supply chain responsiveness and adaptability. Enhanced network capabilities allow supply chains to adjust and reconfigure resources rapidly in response to unexpected events and market fluctuations. Hence, this leads to the following proposition.

P3: Blockchain adoption promotes supply chain resilience through network capability.

3.3. Relationship performance

The study of business relationships originates in marketing, with Dwyer et al. (1987) emphasizing their importance. The primary purpose of such relationships is to connect the customer's purchasing activities with the supplier's sales and services (Selnes & Sallis, 2003). In industrial marketing research, relationship performance is defined as the extent to which organizations perceive the effectiveness of their relationships with key collaborators (Liu et al., 2012; Selnes & Sallis, 2003). It focuses on the connections between partners. These connections include mutual trust, communication, and collaboration, and their impact on organizational goals (Paulraj et al., 2008; Poppo et al., 2016). Previous literature has examined how to measure relationship performance, typically selected based on partner satisfaction, communication quality, and transaction volume (Ariño, 2003; Park et al., 2012).

Supply chain resilience contributes to business continuity and stability when supply chains face uncertain changes. This stability also strengthens cooperation between supply chain partners. Simultaneously, supply chain flexibility helps business processes adapt to market changes (Cui et al., 2022; Dubey et al., 2020; Zhou et al., 2022). Supply chain robustness facilitates steady operations amidst external shocks and uncertainties, reducing uncertainty among partners and boosting overall performance (Lin et al., 2021; Ruel & El Baz, 2023; Wang et al., 2023; Xu et al., 2023). Robustness also promotes its flexibility to adapt to market changes, thereby boosting members' confidence and positively impacting their relationships' performance (Cohen & Kouvelis, 2021). Supply chain agility enables partners to adapt to market changes swiftly, enhancing satisfaction and trust (Aslam et al., 2018; Nyamrunda & Freeman, 2021). Therefore, the following proposition is proposed:

P4: Supply chain resilience is positively related to relationship performance.

The conceptual mode is presented in Figure 1.

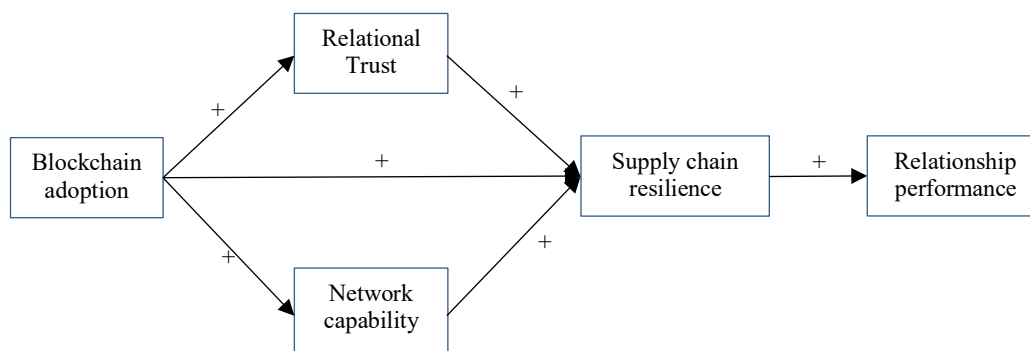


Fig 1: Conceptual model

4. Discussion

4.1. Theoretical implications

This study provides new theoretical insights into the application of blockchain technology in supply chain management, particularly its role in improving supply chain resilience and relationship

performance. It reveals how blockchain influences supply chains and expands the current literature on supply chain management and blockchain applications. Unlike previous studies focusing on blockchain's impact on efficiency and financial performance, such as Song et al. (2023) and Jiang et al. (2022), this research highlights blockchain's vital role in enhancing relational trust, increasing network capacity, and improving supply chain resilience.

This study develops an integrated framework that combines blockchain technology, the relational perspective, and dynamic capability theory. We explore the parallel roles of relational and capability factors in the blockchain environment, showing how these factors work together to enhance supply chain resilience in supply chain management. Unlike prior research, we integrate blockchain technology with these two dimensions to examine their impact on supply chain resilience. We also explore the mediating role of relational trust and network capabilities in a blockchain environment. Relational trust serves as a mediating mechanism that enhances supply chain adaptability and resilience by increasing cooperation willingness and information sharing. Similarly, network capacity acts as an intermediary mechanism, improving the supply chain's ability to respond to market changes and emergencies by optimizing resource integration and coordination.

4.2. Practical implications

Firstly, blockchain technology offers a robust foundation for establishing trust and transparent communication between supply chain partners due to its transparency and immutability. For managers, this implies that blockchain technology enables more accurate resource tracking and efficient collaborative coordination to optimize operational management. Managers should actively explore blockchain technology integration to improve information sharing and collaboration efficiency, thus enhancing relational trust in the supply chain. Secondly, managers should consider utilizing blockchain technology to optimize resource allocation and collaborative operations, thereby improving overall supply chain performance and resilience. For example, blockchain technology allows supply chain members to share production, inventory, and transportation data in real-time, optimizing resource

utilization and improving supply chain responsiveness and adaptability. Additionally, blockchain technology significantly enhances supply chain adaptability and resilience to external shocks by improving relational trust and network capabilities. In practice, managers can use blockchain to build a resilient supply chain system capable of quickly adjusting strategies and responses to supply disruptions or market volatility.

5. Conclusion

In conclusion, this study explores the application of blockchain technology in supply chain management, focusing on its role in enhancing resilience and relationship performance. The research proposed a theoretical model that integrates the relational view and dynamic capabilities theory to demonstrate how blockchain technology enhances supply chain resilience and relationship performance by improving relational trust and network capabilities. However, this study is limited to a theoretical model without empirical analysis. Future research should collect real-world data to validate the model.

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MS0038: AI Capability and Innovation Ambidexterity in Small and Medium-Sized Manufacturing Enterprises: The Role of Dynamic Capability and Entrepreneurial Bricolage

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**AI Capability and Innovation Ambidexterity in Small and Medium-Sized Manufacturing
Enterprises: The Role of Dynamic Capability and Entrepreneurial Bricolage**

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Abstract

In the past decade, the rapid advancement of digital technologies has made Artificial Intelligence (AI) capability indispensable for businesses, including small and medium-sized manufacturing enterprises (SMMEs) (e.g., Dey et al., 2023). AI technologies can revolutionize innovation processes by offering sophisticated data analytics, automating repetitive tasks, and enhancing decision-making (Haefner et al., 2021). Numerous studies have emphasized the significant impact of AI on various business functions and its crucial role in promoting innovation (e.g., Liu et al., 2024). However, there is still limited understanding of how AI can be effectively integrated into the innovation processes of SMMEs, especially regarding its ability to balance exploitative and explorative innovation, also known as innovation ambidexterity (e.g., Wang & Rafiq, 2014). In addition, while recent studies have investigated the role of entrepreneurial bricolage in fostering innovation within resource-constrained environments, the interaction between AI capability and entrepreneurial bricolage in SMMEs remains underexplored (e.g., Steffens et al., 2023).

In this study, we explore the roles of AI capability, dynamic capability, and entrepreneurial bricolage in fostering innovation ambidexterity within SMMEs. Drawing upon the theories of dynamic capabilities and entrepreneurial bricolage, our research proposes a new conceptual framework that integrates these elements to understand their collective impact on innovation ambidexterity. By theorizing the mediating and moderating effects of dynamic capability and entrepreneurial bricolage, we aim to uncover the underlying mechanisms through which AI capability influences both exploitative and explorative innovation in SMMEs. Our study addresses critical gaps in the literature by examining how SMMEs can leverage AI to balance and enhance their innovation outputs. The findings provide novel insights into the strategic management of AI resources and the cultivation of dynamic capabilities and entrepreneurial bricolage to drive sustained innovation and competitive advantage in the dynamic business landscape.

Keywords: AI Capability, Entrepreneurial Bricolage, Dynamic Capability, Innovation Ambidexterity, Small and Medium-Sized Manufacturing Enterprises

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MS0040: The Hidden Hallyu Unleashed: Unpacking the Key Success Factors through Text Analysis

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Abstract

This study aims to analyze the factors contributing to the successful globalization of webtoons, one of the emerging Korean Wave (Hallyu) content. By applying topic modeling to reviews of Naver webtoons, it was found that non-dramatized webtoons exhibit one-way communication characteristics, whereas dramatized webtoons demonstrate a virtuous cycle structure. These findings are expected to provide valuable academic and practical implications for researchers studying Hallyu.

Keywords: Webtoon, One Source Multi Use (OSMU), Topic modeling, Globalization, Dramatized

1. Introduction

With the increasing demand for digital content, a new type of Korean Wave (Hallyu) content, known as "webtoons," has been emerging (Jang & Song, 2017). In 2022, the webtoon industry size was estimated to stand at around 1.83 billion South Korean won. In the industry, platforms like Naver webtoon or Kakao Webtoon made up for the majority of the industry (Statista, 2024). Especially, Naver LINE

Webtoon is one of the most popular comics reading applications with a total downloader more than 600,000 (Nisa, B. 2020). However, previous studies have primarily focused on the phenomenon of webtoons expanding overseas due to the Hallyu wave (Ruskykh, 2023), with insufficient analysis of the factors that enabled Korean webtoons to rapidly capture global markets (Yecies, Shim, Yang, & Zhong, 2020). Thus, this study aims to explore the key success factors of K-webtoons by utilizing topic modeling.

2. Literature and Framework

2.1 Globalization through Webtoons and the OSMU Strategy

The growth of K-webtoons has not only reshaped the landscape of the global content market but also exemplified the effectiveness of the One Source Multi-Use (hereafter, OSMU) strategy. Compared to traditional comics, K-webtoons frequently utilize intellectual property (IP) to transition from digital comics into adaptations such as dramas, films, and merchandise. This cross-media adaptation accelerates the global recognition and engagement of K-webtoons (Cho, 2021). In the global market, the OSMU strategy plays a pivotal role in the international dissemination of K-webtoons (Hong, Lee, & Kang, 2024). This strategy is particularly effective in overcoming cultural and linguistic barriers. Webtoons adapted into dramas or films offer visual storytelling that transcends textual limitations, thereby captivating new audiences and driving broader content consumption. Recent studies suggest that the OSMU strategy serves as a critical tool for targeting diverse readerships (Jang & song, 2017). It demonstrates the formation of a positive synergy loop between webtoons and their adapted content, further enhancing global visibility and appeal.

3. Method and Results

3.1. Analysis Method

Topic modeling is a popular statistical tool for extracting latent variables from large datasets, particularly

useful for structuring such datasets to make them more accessible and analyzable (Vayansky & Kumar, 2020). This study focuses on Naver Webtoons, which have demonstrated significant success both domestically and internationally (Huh, Lee, Choi, Kim, Oh & Kim, 2022), utilizing reviews of these webtoons for analysis.

3.2. Result

To examine the differences between dramatized webtoons and non-dramatized webtoons, reviews were categorized and analyzed using topic modeling. Based on the results, group labeling was performed, and causal relationships between the groups were analyzed.

<Figure 1> insert about here

<Figure 2> insert about here

3.2.1. Non-Dramatized Webtoons

Non-dramatized webtoons primarily establish a one-way communication structure with their readers, following key stages in the process of content consumption and fostering loyalty toward the creators. The results of this process can be observed in <Figure 1> and <Figure 2>.

In summary, non-dramatized webtoons engage in one-way communication with their readers, lacking feedback loops or cyclical processes. While this unidirectional structure is effective in fostering reader immersion and loyalty, it presents limitations in further content expansion or ecosystem development.

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In summary, non-dramatized webtoons engage in one-way communication with their readers, lacking feedback loops or cyclical processes. While this unidirectional structure is effective in fostering reader immersion and loyalty, it presents limitations in further content expansion or ecosystem development.

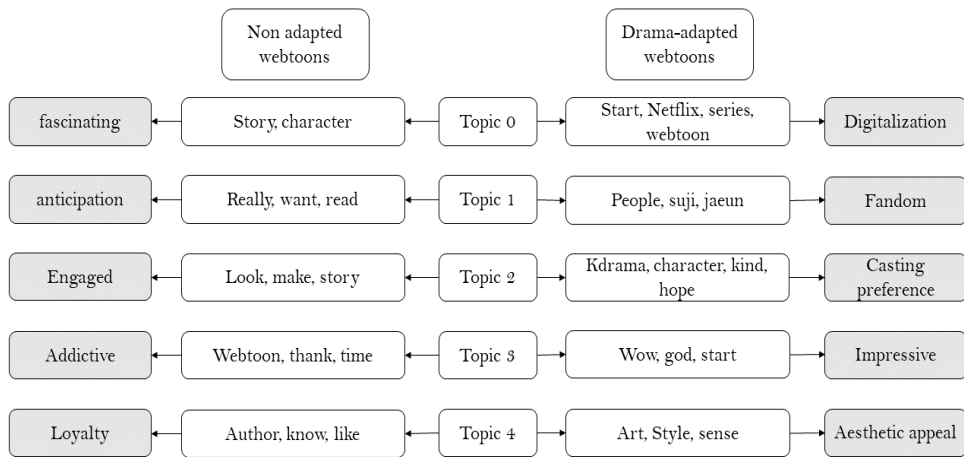
4. Discussion

This study provides significant contributions to the academic discourse on K-webtoons and their globalization, with the following implications. First, Broadening the Research Scope on K-Webtoons: This study uniquely focuses on K-webtoons, a relatively underexplored subject in academic literature, thereby expanding research on their globalization. By emphasizing K-webtoons' cultural and economic impact, this study highlights their importance as a key driver of the Hallyu phenomenon. Second, Proposal of a New Framework: Through the application of topic modeling, this study introduces a novel framework for analyzing the globalization of K-webtoons. The framework provides insights into the mechanisms and strategies that contribute to their success, offering valuable guidance for researchers and practitioners alike. Third, Strategic Insights for the Industry: The findings indicate that dramatized webtoons exhibit a virtuous cycle that accelerates globalization and facilitates consumer engagement. This suggests that leveraging drama adaptations and employing OSMU strategies across diverse platforms can significantly enhance K-webtoons' global reach and appeal. While this study contributes meaningful insights, it also acknowledges certain limitations. The findings derived from topic modeling require further validation through interviews with industry stakeholders, such as webtoon creators and professionals from platforms like Naver webtoon. Future research should incorporate such qualitative methods to corroborate and refine the results. And this study focuses exclusively on successful K-webtoons in the global market, omitting cases of unsuccessful attempts. Future studies should include comparative analyses of unsuccessful webtoons to uncover additional insights and provide a more balanced perspective. In conclusion, this study lays a foundation for understanding the globalization of K-webtoons, providing actionable insights while paving the way for future research to address existing gaps.

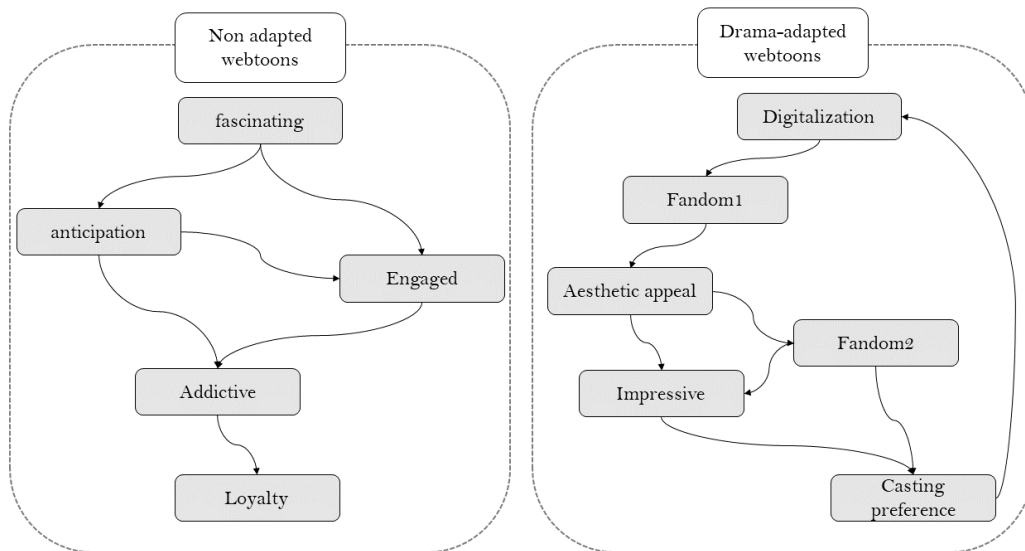
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Appendix



<Figure 1. Topic modeling results>



<Figure 2. Comparison of the flow of non-adapted webtoons vs drama-adapted webtoons>



MS0042: Does Board Network Centrality Influence Firms' Internationalization? The Effects in Chinese High-Tech SOEs

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Does Board Network Centrality Influence Firms' Internationalization?

The Effects in Chinese High-Tech SOEs

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Extended Abstract

Using panel data regression analysis across three distinct periods (2011-2014, 2015-2018, 2019-2022), we empirically examine how board network centrality influences the internationalization of Chinese high-tech state-owned enterprises (SOEs). Our findings reveal that board centrality has a positive impact on internationalization, especially after the COVID-19 pandemic. Political connections significantly weaken this effect, while the board's overseas experience and the number of foreign directors significantly enhance it. These results underscore the critical role of social network resources in navigating the complexities of internationalization, despite the domestic political hindrances that may arise, highlighting the need for strategic network management.

Keyword : Chinese High-Tech Firms, Board Network, Overseas Performance, SOEs

1. Introduction

1.1. The State-Owned Enterprises (SOEs) and Their International Challenges

State-owned enterprises (SOEs) have significantly increased their presence in the Fortune Global 500, rising from 27 in 2000 to 102 in 2017. Chinese SOEs have notably grown from 9 to 75 during this period (Lin et al., 2020). Despite domestic success, Chinese SOEs face inconsistent international performance, termed the "China Puzzle" (Lin et al., 2020). High-tech SOEs are vital for technological

advancement and economic growth but face challenges like technological uncertainties and intellectual property issues. This study examines the influence of board network centrality on the international performance of Chinese high-tech SOEs in emerging markets, investigating political connections' impact on decision-making and performance, and the role of foreign or internationally experienced directors in enhancing performance. By focusing on state-owned high-tech firms, this research fills literature gaps and offers practical insights to improve corporate governance and international competitiveness, particularly in emerging markets. The findings provide recommendations for optimizing governance structures and guide policymakers in developing effective internationalization strategies, enhancing SOEs' success in global markets, especially in emerging markets. This study holds significant theoretical and practical value by analyzing the unique role of board network centrality in the internationalization process of Chinese high-tech SOEs.

2. Literature review and hypothesis

2.1. Board Network Centrality and SOEs' Overseas Performance

Social network theory posits that complex networks influence information flow and decision-making in organizations (Peng, M. W., & Luo, Y., 2000). In corporate governance, board members' social networks are crucial for resource acquisition and strategic decision-making (Collins & Clark, 2003). Resource dependence and social capital theories highlight the significance of these networks in accessing external resources and information (Hillman et al., 2009).

China's "Go Global" strategy, launched in 1999, promotes SOEs, particularly high-tech ones, to increase foreign investments and enhance international competitiveness. High-tech SOEs are vital for technological innovation and global influence. Their governance, shaped by government policies, affects international performance (Li & Naughton, 2007). Limited research exists on the impact of

board network centrality on Chinese high-tech SOEs' international performance, especially under specific institutional conditions. This study aims to bridge this gap by investigating the global outcomes of these enterprises.

2.2. Theoretical Framework and Hypotheses

2.2.1. Board network centrality and international performance

In China, relationship-building is critical for business sustainability (Peng, M. W., & Luo, Y., 2000). Directors with high centrality can effectively obtain and disseminate information, enhancing financial performance (Afzali & Kettunen, 2022). Therefore, we propose *H1. In state-owned high-tech enterprises, board network centrality has a positive impact on their international performance.*

2.2.2. The Moderating Effect of Directors' Characteristics

Research indicates that SOE boards' reliance on government guidance hinders adaptability in international markets, with political connections leading to legitimacy challenges and regulatory scrutiny (Cui & Jiang, 2012). Therefore, we propose *H2. In state-owned high-tech enterprises, the greater the political connections, the weaker the positive impact of board network centrality on international performance.*

The educational background of top management teams significantly enhances market adaptability and innovation, positively influencing the financial performance of Chinese firms (Gottesman & Morey, 2006). Therefore, we propose *H3. In state-owned high-tech enterprises, the greater the number of directors with foreign educational backgrounds, the stronger the positive impact of board network centrality on international performance.*

Executives with international experience bring valuable knowledge, enhancing innovation and market performance (Sommer, L. 2012). Therefore, we propose *H4. In state-owned high-tech enterprises, the*

greater the number of directors with overseas work experience, the stronger the positive impact of board network centrality on international performance.

Board diversity, particularly with foreign directors, enhances competitiveness by providing unique skills and insights. Diverse boards improve decision-making and market performance (Goodstein et al., 1994). Therefore, we propose *H5. In state-owned high-tech enterprises, the greater the number of foreign directors, the stronger the positive impact of board network centrality on international performance.*

3. Methodology

Our sample is derived from the CSMAR database, focusing on high-tech state-owned enterprises (SOEs) based on industry standards and ultimate controller nature. We excluded companies not engaged in international business, lacking key variables, or facing listing issues. We compiled board member lists into a company-director matrix, analyzed with UCINET for network centrality. After data cleaning, the final sample includes 2,143 high-tech SOEs from 2011 to 2022.

The baseline model assesses the impact of board network centrality on the overseas performance of state-owned high-tech enterprises, specified as follows:

$$OIP_{i,t} = \alpha_0 + \beta_1 NScore_{i,t} + \sum_{j=1}^n \gamma_j Control_{i,t} + \delta_i + \varepsilon_{i,t}$$

where *OIP* is the dependent variable representing the proportion of overseas revenue to total revenue, measuring international performance. *NScore* denotes board network centrality. *Control* includes the proportion of politically connected directors (*Political*), directors with overseas education (*OSEdu*), directors with overseas work experience (*OSExp*), foreign directors (*FD*), board size (*BSize*), firm size (*Size*), Tobin's Q (*TobinQ*), firm age (*Age*), and R&D expenditure ratio (*RD*). δ_i represents the unobserved individual effects, and $\varepsilon_{i,t}$ is the error term.

To examine moderating effects, the model is extended with interaction terms:

$$OIP_{i,t} = \alpha_0 + \beta_1 NScore_{i,t} + \beta_2 (NScore \times Moderator)_{i,t} + \sum_{j=1}^n \gamma_j Control_{i,t} + \delta_i + \varepsilon_{i,t}$$

where Moderator represents the moderating variables such as *Political*, *OSEdu*, *OSExp*, and *FD*.

4. Discussion and conclusion

This study examines the impact of board centrality, political connections, overseas education, overseas experience, and foreign directors on the international performance of Chinese state-owned high-tech enterprises through panel regression analysis over three periods (2011-2014, 2015-2018, 2019-2022).

Board Centrality. The importance of board centrality has increased over time, especially during the pandemic (2019-2022), indicating a greater reliance on network resources and information for international performance. *Political Connections.* Political connections show significant negative effects on international performance in later periods, suggesting a need to balance policy support with potential regulatory and bureaucratic constraints. *Overseas Education and Experience.* Overseas experience has a strong positive effect, particularly in the later periods, while the impact of overseas education is more complex and sometimes negative, highlighting the value of practical international experience. *Foreign Directors.* Foreign directors consistently have a positive impact on international performance, providing diverse perspectives, cross-cultural management experience, and direct links to international markets, especially during the pandemic.

These findings reveal the complex mechanisms of board centrality and its diverse characteristics in the internationalization process, emphasizing the multifaceted and evolving nature of centrality in response to external environments and organizational development stages.

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MS0043: How Do Entrepreneurial Firms Choose Resources at Different Growth Stages in Business Incubators? The Multiple Case Study of China

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How do entrepreneurial firms choose resources at different growth stages in business incubators? The multiple case study of China

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Abstract: The proliferation of incubators in recent times has provided a favourable external environment for entrepreneurial firms with the intent of facilitating their smooth developmental trajectory. However, owing to the distinct stages of growth that these startups undergo, the attendant management challenges vary significantly, implying differential resource and support requisites. This study, based on resource dependency theory, conducts case studies of eight Chinese firms across three incubators and found that 1) in the conception phase, startups predominantly prioritise foundational resources; 2) the commercialisation phase places greater emphasis on tailored resources; 3) the growth phase necessitates a heightened demand for strategic resources.

Keywords: Entrepreneurial firms, incubators, enterprise growth stages, resources

INTRODUCTION

Recent studies have examined how start-ups create and grow in the current environment (Hechavarría et al., 2016; Colombelli, 2016; Innocenti & Zampi, 2019), and confirmed that the success of new ventures fosters innovation, generating employment opportunities, and drives regional economic development (Urbano et al., 2020). Nevertheless, organisational development carries inherent risks and costs, thereby ushering in a host of undisclosed management challenges for enterprises as they strive for viability. Particularly, nascent enterprises, constrained by their inherent capabilities, frequently grapple with transcending the aforementioned dilemmas, consequently contributing to the persistently elevated failure rates (Pe'er et al., 2014). To support new venture growth, recent years have witnessed a proliferation of incubators that furnish entrepreneurs with cost-effective office spaces, limited financial backing, and pertinent business networks (Capatina, et al., 2023). However, in terms of incubators, new concerns arise. Incubator managers' overconfidence in understanding enterprise development can lead to misallocated resources (Wu et al., 2014). Additionally, unpredictable growth rates cause divergent resource needs (Baum & Mezias, 1992). Excessive resources may make ventures overly reliant on incubators, hindering their ability to establish themselves in society (George, 2005). Consequently, delineating the genuine needs of incubated enterprises assumes significance in bolstering both their survival rates and the efficacy of the incubation process (Marcon & Ribeiro, 2021). Nevertheless, the mechanisms that underpin the relationship between startups and its specific resources preference to meet their specific needs in different phases remain unknown. Considering that, this paper addresses technological startups in emerging countries and their resource preferences to shed light on how incubators ecosystems can help startups overcome internal resource constraints. Therefore, we used the following question to guide our research: *"How do startups leverage the resources from incubators ecosystem's actors throughout their lifecycle to foster growth?"*. Ultimately, we describe the preference derived from each lifecycle phase's resources under a

resource dependence theory perspective.

LITERATURE AND FRAMEWORK

Business Incubators

Löfsten and Lindelöf (2001) define an incubator as an organisation providing resources to support new small businesses and corporate spin-offs. Incubators positively impact their tenants by offering essential resources (Yusubova et al., 2019). However, in developing economies, traditional incubator roles may not effectively foster entrepreneurship due to necessity-driven rather than opportunity-driven entrepreneurship (Venkataraman, 2004). Resource preferences vary across startup growth stages, leading to divergent evaluations of incubator resources (Monsson & Jørgensen, 2016). For example, as startups mature, the importance of resource management shifts from market issues to human resource complexities (Shim et al., 2000). While some studies show positive impacts of incubator support (Yusubova et al., 2019), others report no effect (Meyer, 2003; Chan & Lau, 2005), indicating inconclusive results (Soetanto & Jack, 2016). Research on aligning incubator resources with startup needs across different development stages is limited, leading to inefficiencies and resource wastage (Bøllingtoft, 2012).

Resource dependence theory and startup growth lifecycle

According to RDT, organisations face complex environments due to their diverse relationships with entities having different agendas, viewpoints, and concerns (Pfeffer and Salancik, 1978). Furthermore, an organisation's performance and survival partly depend on its ability to evaluate the environment and control resources from external partners who have diverse interests and agendas (Wry et al., 2013). However, resources for new ventures are diverse and dynamic due to their different business needs at certain stages. The literature outlines various phases of the life cycle for different business ventures and each growth stages may require unique

resources from incubators to support their development, leading to significant differences in their ability to efficiently use resources (König et al., 2019). Kazanjian's (1988)'s organisational life cycle model classifies firm life cycle into four stages, conception, commercialisation, growth, and stability. Fisher et al. (2016) adopted the first three stages—conception, commercialisation, and growth—as most relevant for technology ventures, focusing on legitimacy judgments for new versus established firms. While lifecycle models share common concepts, they vary in context (Fisher et al., 2016). We adopt Kazanjian's (1988) model, focusing on the conception, commercialisation, and growth stages, to address gaps in understanding resource preferences for new ventures. By integrating this model with Pfeffer and Salancik's (1978) RDT, we gain insights into how small firms in incubators leverage resources throughout their development stages.

METHODS AND RESULTS

Methods

The research question of this study is *“How do startups leverage the resources from incubators ecosystem's actors throughout their lifecycle to foster growth?”*. The study examines how startups use resources from incubators throughout their lifecycle to promote growth. It employs a multiple case study approach (Eisenhardt and Graebner, 2007), analysing data from eight firms across three incubators in Hangzhou, China. The study uses purposeful sampling to select incubators with notable ecosystem attributes and varying levels of support. Cases include Hangzhou Yinjiang Incubator, Hangzhou East Software Park, and Hangzhou Zhejiang University Net New Entrepreneurship Hive. Data collection involved interviews and field observations from 2017 to 2019, focusing on individual startups and their interactions with incubators. Interview sessions were about one hour each. The interview duration was controlled to approximately one hour. Details of data collection is shown in Table 1 below.

-----see Table 1 here-----

Following the thematic analysis technique proposed by Miles and Huberman (1984), as illustrated by the following Table 2, interview materials are systematically organised to distill overarching characteristics. We independently coded the data and cross-checked to achieve a high level of agreement among the coders using the analysis tool NVivo. We transcribed the data within 24 hours of the interviews. Initial analysis generated 30 keywords, which were then coded into 8 core segments. These codes were organised into three themes: “Foundational Resources,” “Tailored Resources,” and “Strategic Resources.”

-----see Table 2 here-----

Results

This study, through multiple case study of eight enterprises across three incubators in China, found the resource dependencies of startups on incubators in three distinct growth life cycle stages: the conception, the commercialisation, and the growth, along with their interaction with incubators. Figure 2 illustrates the dynamic interactions between incubators and entrepreneurial startups throughout their life-cycle stages, highlighting how incubators provide crucial support to facilitate the growth and development of startups. At the conception stage, the interaction between incubators and startups focuses on foundational support necessary for establishing the firm. During this early phase, incubators provide essential resources such as fixed assets, business support for research and development, and boundary-spanning relationship networks that offer access to mentors, advisors, and potential partners crucial for early-stage growth. As startups move into the commercialisation stage, the interaction with incubators becomes more tailored to facilitate market entry and development. Incubators offer customised guidance and resources aligned with the startup’s unique business model, along with insights and understanding of market trends, and customer needs to help refine

their market strategy. In the growth stage, interactions between incubators and startups deepen to support market expansion and stabilisation. Incubators provide strategic resources such as assistance in exploring and entering international markets, support in aligning business strategies with national goals, and infrastructure development to sustain the expanding operations of the startup. Throughout these stages, the dynamic interaction between incubators and entrepreneurial enterprises evolves to address the changing needs of the startups, ensuring they receive the appropriate resources and support necessary at each phase of their development.

-----see Figure 2 here-----

DISCUSSION

This study explores how incubated startups interact with incubators across different growth stages, revealing distinct resource needs. It advances theoretical understanding by applying a lifecycle stage perspective and RDT to address previous inconsistencies regarding incubator resources and startup survival. Unlike traditional resource-based views focused on mature firms, this study highlights the unique resource needs of startups and emphasises that incubators should tailor their support to these evolving needs to prevent failure. This research enhances understanding of resource dynamics and dependencies for startups at various growth stages. Furthermore, This study explores why startups might fail even in supportive environments by adopting an ecosystem perspective on incubator interactions (Spigel, 2017; Theodoraki et al., 2017). It identifies how both excess and insufficient resources affect startup development, reinforcing previous findings that resource availability influences startup behavior and success (Blank, 2020). By focusing on the misalignment between resource supply and demand across different growth stages, the study highlights potential causes of incubator inefficiency and startup failure. It suggests that evolving the dynamic interactions between startups and

incubators is crucial for addressing changing resource needs and improving incubator efficiency.

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MS0044: Unlocking Microenterprise Performance in Indonesia Craft Industry: The Role of Business and Political Networking Capabilities

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Unlocking Microenterprise Performance in Indonesia Craft Industry: The Role of Business and Political Networking Capabilities

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Extended Abstract

This study aims to provide empirical findings on how business networking capability (BNC) and political networking capability (PNC) developed by microenterprises (MEs) influence their performance. It also examines how entrepreneurial orientation (EO) and owner generation cohorts (GC) (Gen X and Y) moderate these relationships. Using a quantitative approach, we surveyed 187 craft MEs in Indonesia. Results show that both BNC and PNC positively impact performance. Although EO strengthens the BNC-performance and not the PNC-performance relationships, GC strengthens both the BNC-PNC-performance relationship, with Generation Y demonstrating a more pronounced effect. We using RBV to provide practical insights for MEs performance.

Keywords: microenterprise, business networking capability, political networking capability, owner generational cohorts, entrepreneurial orientation, craft sector

1. Introduction

MEs play a key role in generating employment and income across many developing countries, with their impact being particularly notable in Indonesia (Auwalin, 2021). As MEs across various industries have increasingly attempted to connect with external parties to enhance their competitive advantages, the research domain of MEs engaging in network with others has attracted attention from scholars, industry professionals, and policymakers (Zhang, 2023). Wegner et al., (2023) conducted a meta-analytical study and found that firms in specific contexts may experience a higher relevance of their networking capabilities for performance, yet gaps remain in how the different types of networking capabilities can enhance MEs performance (Galloway et al., 2022).

Our research aims to address previous research gaps by drawing upon resource-based view to investigate whether and how the distinct types of networking capabilities (i.e BNC and PNC) develop by MEs contribute to their performance. This study also examine whether EO and GC (i.e. Gen X and Gen Y) will moderate the BNC-PNC and performance relationship.

Our research provides key managerial insights for MEs. We recommend MEs conducting self-assessments to evaluate and align their BNC and PNC strengths and weaknesses with effective performance strategies. MEs should focus on 'maximizing network efficiency' and 'tailoring approaches to specific contexts' to optimize resource use and choose suitable strategies for their needs.

2. Literature and hypothesis development

2.1 Resource-based view and generational perspective

The RBV posits that firms generate value by integrating complementary and specialized resources and capabilities. Business and political networking capabilities (BNC and PNC) enable firms to obtain rare, unique resources and combine them with their capabilities to enhance competitive advantages (Yamakawa et al., 2008). From an RBV perspective, BNC and PNC are valuable assets for expanding knowledge and technological resources. Current literature emphasizes the role of entrepreneurial orientation—innovation, proactivity, and risk-taking—in promoting venture success (Lee & Kreiser, 2018). The distinctiveness of MEs is primarily due to the unique traits of their owners (Runst & Thomä, 2023). While GC in the workforce have been explored, their impact on entrepreneurship is less studied (Zhang & Acs, 2019). It is unclear if GC in the workforce influence entrepreneurial behaviors. To address this, we use the concept of GC to explore how historical experiences shape entrepreneurs (Lippmann & Aldrich, 2016).

2.2 The effect of business and political networking capabilities on microenterprises performance

BNC is a MEs ability to establish and leverage relationships with other businesses, partners, customers, and stakeholders Click or tap here to enter text.(Adomako et al., 2018). From a resource-based view (RBV) perspective, BNC are strategic assets that provide MEs with unique advantages in building, managing, and leveraging relationships. Therefore, we propose:

Hypothesis 1: Microenterprises' business networking capabilities, will positively contribute to higher microenterprises performance.

PNC refers to a firm's ability to build and leverage relationships with political stakeholders, such as government officials, legislators, and policymakers (Wang et al., 2022). Engaging in PNC enables MEs to capitalize on their strengths by staying updated on industry trends, expanding their client base and operations and gaining external legitimacy (Dreyer & Busch, 2022). Given this perspective, we believe that firms with the capability to build PNC can achieve differentiated performance. Therefore, we propose Hypothesis:

Hypothesis 2: Microenterprises' political networking capabilities, will positively contribute to higher microenterprises performance.

2.3 The moderating role of entrepreneurial orientation on business networking capability and performance relationship

EO is one of the most extensively researched constructs in management and entrepreneurship research (Clark et al., 2023). EO is widely acknowledged as a MEs' inclination towards entrepreneurship, characterized by innovation, risk-taking, and proactiveness (Aftab et al., 2022). MEs with a robust EO enhance the benefits of BNC, allowing them to better navigate competitive environments and capitalize on opportunities to boost performance. Therefore, we propose the following hypothesis:

Hypothesis 3a: Entrepreneurial orientation strengthens the positive impact of business networking capabilities on microenterprises performance.

PNC can accelerate access to valuable industry information and policies for microenterprises, helping them integrate this knowledge to improve opportunity recognition and creative potential (Lin & Armstrong, 2016). EO boosts the advantages of PNC, as MEs with higher EO leverage these connections more effectively for resource acquisition, government support, and regulatory compliance. Therefore, we propose:

Hypothesis 3b: Entrepreneurial orientation strengthens the positive impact of political networking capabilities on microenterprises performance.

2.4 The moderating role of owner generational cohorts on political networking capability and performance relationship

Understanding how GC affect business practices and performance is essential, particularly as research on these cohorts within MEs is limited. Previous studies indicate that business owners from different generations have traits that influence their entrepreneurial pursuits (Arkorful et al., 2022). We suggest that both Generations X and Y will positively influence their ability to develop effective BNC, leading to improved performance. Therefore, we propose the following hypothesis:

Hypothesis 4a: Owners generational cohorts strengthens the positive impact of business networking capabilities on microenterprises performance, with Generation Y exerting a stronger effect.

PNC enable firms to access essential resources, secure government support, and navigate regulatory environments more effectively. Generation X owners are often skeptical about political connections (Twenge, 2010), while Generation Y is more inclined to engage in PN due to their involvement in social causes and digital advocacy, and proactively interact with regulatory bodies to anticipate changes. We argue that these GC will enhance the impact of PNC on achieving higher performance outcomes. Hence, we propose:

Hypothesis 4b: Owners generational cohorts strengthens the positive impact of political networking capability on performance of microenterprises, with Generation Y exerting a stronger effect.

3. Method and result

This study surveyed 187 owners of craft MEs in Indonesia using a self-administered questionnaire (Neuman, 2014). We tested the validity and reliability to ensure the accuracy and consistency of our results. We employed the PROCESS macro in SPSS. The overall test results can be seen in Table 1, and Figure (1,2). Hypothesis 1 and 2 were supported, indicating that BNC ($\beta = 0.37, p < 0.001$) and PNC ($\beta = 0.38, p < 0.001$) are more effective in markedly boosting their performance

outcome. Our finding reveals that the interaction BNC*EO was supported ($\beta=0.21^\dagger, P<0.10$), leading us to accept H3a, however the interaction PNC*EO is $\beta=0.05$ ($p>0.10$), therefore, we cannot support Hypothesis 3b. The last two hypotheses (H4a, H4b). Our findings indicate that both BNC ($\beta=0.24, p<0.05$) and PNC ($\beta=0.29, p<0.00$) impact on microenterprise performance is positively moderated by both Generation X (0.27, 0.17) dan Y (0.49, 0.43), Gen Y exerting stronger effect.

Table 1 Hypothesis Result

Variable	Coefficient			
	Model 1 MEsP	Model 2 OP	Model 3 FP	Model 4 MP
Business Networking Capability	$\beta=0.37^{***}$	$\beta=0.30^{***}$	$\beta=0.25^{***}$	$\beta=0.34^{***}$
Political Networking Capability	$\beta=0.38^{***}$	$\beta=0.28^{***}$	$\beta=0.26^{**}$	$\beta=0.37^{**}$
Business Networking Capability*Entrepreneurial Orientation	$\beta=0.21^\dagger$	$\beta=-0.04$	$\beta=0.44^{**}$	$\beta=0.25$
Political Networking Capability*Entrepreneurial Orientation	$\beta=0.05$	$\beta=-0.02$	$\beta=0.12$	$\beta=0.06$
Business Networking Capability*Owner Generational Cohorts	$\beta=0.24^*$	$\beta=0.12$	$\beta=0.47^{**}$	$\beta=0.13$
Political Networking Capability*Owner Generational Cohorts	$\beta=0.29^{***}$	$\beta=0.24^{**}$	$\beta=0.34^*$	$\beta=0.29^*$

$^\dagger p < 0.10$; $* p < 0.05$; $** p < 0.01$; $*** p < 0.00$; MEsP=Microenterprises performance; OP=Operational Performance; FP=Financial performance; MP=Market performance.

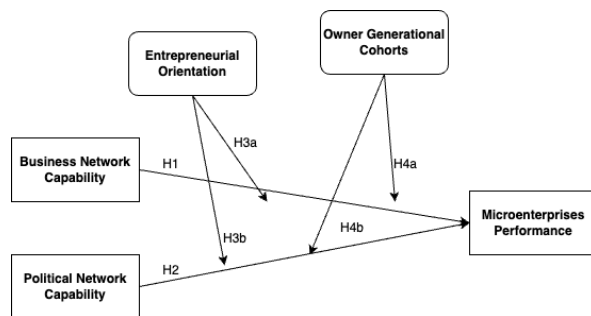


Figure 1 Research Framework

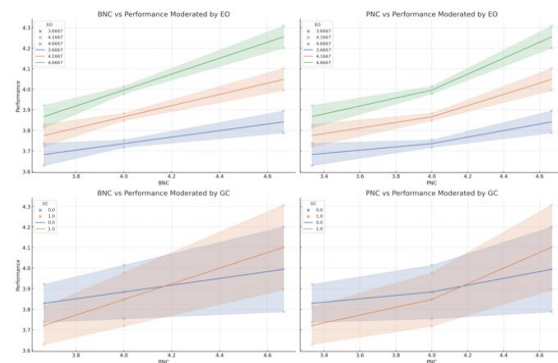


Figure 2 Moderation effect

4. Discussion

Our findings provide important insights into MEs performance, which can be achieved by building BNC, PNC and considering EO and GC. Our research findings align with previous studies even though these studies did not focus on the context of microenterprises. Adomako et al., (2018) highlight that BNC provides variations in performance improvement, while Lin & Armstrong, (2016) emphasize that PNC enhances performance under specific boundary conditions where the PNC is more

or less beneficial. Moreover, our research suggests for future research to explore broader networking dimensions, including social and digital networking, and examine policy and practical implications of enhancing networking capabilities tailored to different GC and EO.

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MS0045: Exploring Triple Helix Collaboration of Microenterprises in Tackling Grand Challenges

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Exploring Triple Helix Collaboration of Microenterprises in Tackling Grand Challenges

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Extended Abstract

This study examines how microenterprises tackle grand challenges using triple helix collaboration. The research employs a qualitative methodology, including interviews with two selected case studies from Indonesia's microenterprises in the creative industry. Artificial intelligence is used to transcribe interview data, and data interpretation is carried out using coding techniques with Atlas.ti software. Our findings highlight that microenterprises in Indonesia adopt distinct approaches and navigate various phases of collaboration in their business development process. From a dynamic capabilities perspective, Triple Helix collaboration effectively tackles grand challenges, significantly aiding microenterprises in their internationalization and helping them compete in a competitive environment.

Keywords: creative industry, internationalization process, grand challenges, microenterprises, triple helix collaboration

1. Introduction

Today growing prevalence of research in business and management talking about how the enterprises can alignment and tackle grand challenges. Previously, research in grand challenges has been done investigating through different form and perspective, like systematic literature review and research agenda (Gray et al., 2022; Ricciardi et al., 2021; Wiklund et al., 2019), climate change (George et al., 2021), poverty (Lashitew & van Tulder, 2020), and responsible innovation (Voegtlin et al., 2022). However, the specific ways in which these challenges can be tackled, particularly in the context of

microenterprises, remain underexplored, especially when viewed through the lens of entrepreneurship and management theory and practice.

To the best of our knowledge, no previous study has explored how triple helix (university-industry-government) collaboration can be leveraged by microenterprises to address grand challenges while facilitating the internationalization process through dynamic capabilities perspective. This study aims to explore the grand challenges encountered by microenterprises in creative industries, particularly those engaged in triple helix collaboration. The objective is to extend previous research by offering a nuanced understanding of the specific grand challenges these microenterprises in growing their businesses. This research will delve into the distinct dynamics and difficulties that shape the entrepreneurial journey for microenterprises in these creative sectors.

This study aims to answer research questions “*How do microenterprises enhance the triple helix collaboration to tackle grand challenges and facilitates internationalization process?*.” This study uses a qualitative method by using two case study of microenterprises in the creative industry especially in craft sector in Indonesia. This research offers new insights how the triple helix collaboration develop by microenterprises will benefit to their internationalization process.

2. Literature review

2.1 Grand challenges and triple helix collaboration

Management scholars have shown a growing curiosity in studying grand challenges. Business and management scholar underscore the crucial need for research centre on these challenges and advocate for bold, innovative strategies to tackle grand challenges (Ferraro et al., 2015; Zahoor et al., 2023). Systematic literature review by Ricciardi et al., (2021) defined grand challenges as system-level wicked problems, meaning they cannot be definitively resolved. Each implemented solution, even if successful, tends to produce unintended consequences that, in turn, must be comprehended and managed.

Furthermore, the endorsement of the 17 Sustainable Development Goals (SDGs) by the United Nations in 2015 has not only provided a comprehensive framework for addressing global challenges

but has also catalyzed a shift in entrepreneurial approaches towards sustainability and social impact. As a result, both scholars and practitioners have recognized the SDGs as a tangible roadmap for translating grand challenges into actionable strategies with measurable outcomes by 2030. Previous research (see Agarwal et al., 2023) highlights three key roles essential for addressing grand challenges: firms, governments, and related stakeholders. It proposes that triple helix collaboration—where microenterprises engage with government, universities, and industry—can be an effective strategy for tackling grand challenges.

3. Method

Our research employed a qualitative case study approach, focusing on two Indonesian microenterprises in the creative industry sector. The Indonesian Creative Economy Agency (BEKRAF) has identified 16 sub-sectors within the creative industry (Alexandri et al., 2019). The term "Creative Industries" refers to industries that are rooted in individual creativity, skill, and talent, and have the ability to generate income and employment opportunities through the creation and utilization of intellectual property and content. We utilized artificial intelligence to transcribe the interviews and analyze the data. Data analysis was conducted using coding techniques with the Atlas.ti software and follow gioia approach (Gioia et al., 2013). We started this study with a broad research question about how microenterprises develop triple helix collaboration, which can then be leveraged to tackle grand challenges. We categorized the background and timeline of the formation of triple helix collaborations for each case, as shown in Table 1.

Table 1 Background and triple helix collaboration time-frame

	Length of operation/ product/People	Role/Education/ Previous experience	Collaboration time-frame
Case 1	12 years/craft leather /5 people	Owner/High school/Tailor	a. Initiation and opportunity recognition (2012-2013, industry ties) b. Innovation and skill development (2013-2020, industry and government ties) c. Recovery and internationalization process (2021-2023, industry-government-university ties)

Case 2	7 years/craft fashion/4 people	Owner/Diploma /Online shop	<ul style="list-style-type: none"> a. Initiation and government collaboration (2017-2018, government ties) b. Internationalization process and industry integration (2018-2022, government-industry ties) c. Pandemic recovery and expansion (2020-2022, government-university ties)
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4. Results and Discussion

Our case study findings reveal that microenterprises in the creative industry faces unique grand challenges. For instance, during the initiation and opportunity recognition stage, microenterprise case 1 encounters significant challenges in responsible production. They perceive these challenges as both opportunities and threats, motivating them to collaborate with industry partners to acquire various techniques and methods for creating high-quality, eco-friendly products.

Under different circumstances, case 2, at the initiation stage of their business journey, faced grand challenges related to gender equality and decent work. They viewed this as an opportunity to contribute to job creation for local communities, particularly women. However, due to limited expertise and skills, they leveraged collaboration opportunities provided by the government, which included learning advanced techniques and methods essential for producing handicraft cloth products. This enabled them to establish new microenterprise. Case 2 gained significant benefits from collaboration, they able to created craft fabric products using Shibori and eco-printing techniques, utilizing both natural and synthetic dyes.

An intriguing discovery is that, during the pandemic, the microenterprises facing different situations while addressing grand challenges. Case 1 did not receive full support from their previous triple helix collaboration and had to temporarily close their microenterprise. As case 1 noted, "*During the pandemic, we faced significant challenges that forced us to temporarily halt operations due to shortages in raw materials and financial constraints.*" Even though they did not receive assistance during the pandemic, case 1 with a high entrepreneurial spirit was able to rise and correct previous mistakes and recover their business by increasing collaboration with triple helix entities (industry-

government-university) which support their first internationalization. In contrast, case 2 received various forms of assistance, enabling them to survive during the pandemic.

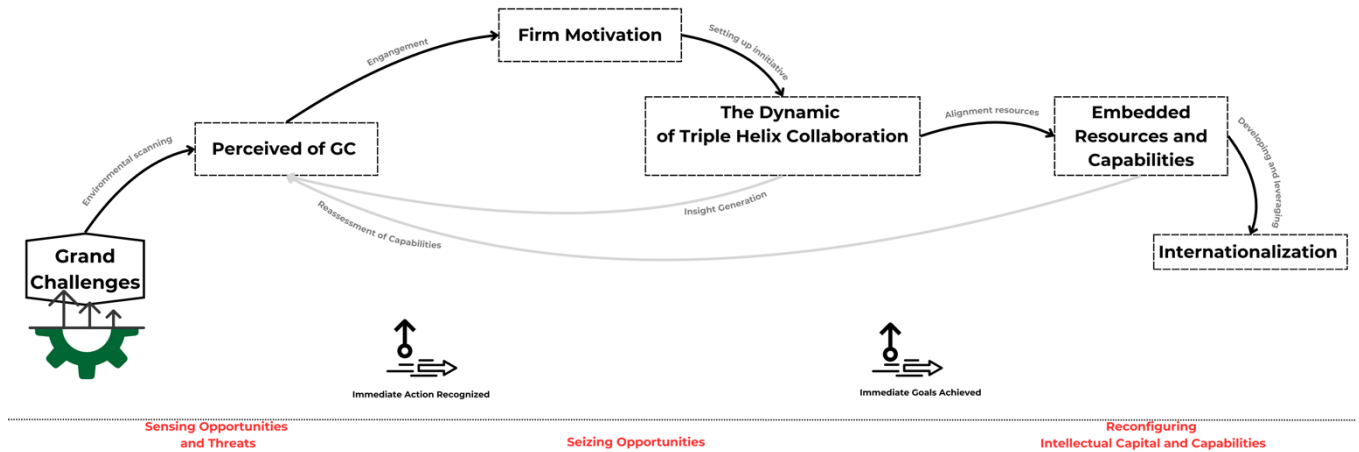


Figure 1 Process Model of Grand Challenges and Triple Helix Collaboration

All our finding and purpose framework can be seen in Figure 2. Based on the results of our qualitative analysis, we found two main findings. First, *Finding 1*, The sequence of collaboration arises from the demand for various valuable benefits, highlighted by advancements in effective collaboration through continuous adaptation and effort. Consequently, the ability of microenterprises to tackle grand challenges is heavily influenced by the progression of their Triple Helix collaborations. This is evident in the varying collaboration needs of microenterprises, influenced by the specific contexts of each case. The effort to enhance collaboration greatly affects their ability to maintain current partnerships, even in challenging situations like the pandemic. Our findings indicate that during the pandemic, Case 2 gained substantial support from its triple helix collaborations, while Case 1 did not.

Next, *Finding 2*, Different forms of Triple Helix collaboration can affect the internationalization process in various manners, contingent on the resources that microenterprises acquire from these collaborations. The internationalization process resulting from triple helix collaboration can be categorized into two types of approaches: proactive and reactive. Triple helix collaboration aids in the internationalization of microenterprises, depending on the benefits provided. From the two case studies, we identify two main internationalization approaches: reactive and proactive. Reactive approaches involve leveraging collaborative project opportunities under the triple helix that directly engage in

international activities, requiring strong and evolving collaborations. Proactive approaches focus on self-learning, providing microenterprises with access to market research, buyer information, international shipping discounts, and mentoring. Furthermore, we recommend that future research explore how microenterprises confront various grand challenges. Quantitative studies should be conducted to verify whether triple helix collaboration can enhance a microenterprises ability to address grand challenges (Zahoor et al., 2023).

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MS0046: Investigating the Interplay Between the Socialization New members and the Adaption of Veteran Employees

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Investigating the interplay between the socialization new members and the adaption of veteran employees

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Extended Abstract

With the changing economic environment and the accelerating process of globalization, the need for effective onboarding programs has never been more urgent. Many local governments and companies have introduced policies to attract top talents by raising the recruitment threshold and salary level. However, it also raises the question of why so many people still need help finding work, and even a large number of employees have switched jobs. For research further in management, the time to act is now.

Most companies try to screen out the best match during the hiring process, hoping that the new employee will produce performance as soon as he or she enters the organization. Nevertheless, they often overlook the problem of socialization. Even the best employees who fail to adapt to the organization's work processes and environment are considered "under-qualified" or "mismatched."

Bauer and Erdogan (2011) showed that induction training is vital in new employees' adaptation and organizational commitment. In addition, recent Forbes and Harvard Business Review articles show that companies with robust onboarding programs have higher employee engagement and lower turnover rates, underscoring the need for a comprehensive social strategy.

Newcomers should undergo systematic training to effectively interact with old timers, gradually adapt to the company's work processes, and create value. This will improve work efficiency and employees' satisfaction, as well as enhance the employees' sense of identity with the organization and reduce turnover. Such measures will lay the foundation for the

development of local governments and organizations and are the best way for them to attract and retain talent.

Keyword: socialization, management, employee, organization.

1. Introduction

Recent years, as the government vigorously prompt the quality migrant admission scheme (Hong Kong Government, 2006) that large number of talents whom as newcomers compared to local old timers were attracted to work in local. As as result, managers of the organization face with the tremendous pressure of the how to allocate their precious time and limited resources in an effective way. One area in which managers' decision to invest time and energy has particularly important implications is to deal with the socialization of new members(new employees/ newcomers) and the adaptation of veteran employees(old timers/existing employees).(Jokisaari, 2013; Settoon & Adkins, 1997).

The interplay relationship between new member socialization and veteran employees' adaptation is an important area of organizational behavior research. Although many studies have explored the process and outcome of socialization of new employees (Bauer & Green, 1998; Allen, 2006), there are still significant research gaps in understanding how the interaction between new and experienced employees affects mutual adaptation, and even whether new and old employees finally have a long-term commitment to the company. This review aims to synthesize the current literature on these dynamics, highlighting the impact of old timers on the socialization of newcomers, and how newcomers' employees influence the adaptation and continued integration of existing employees within an organization.

Based on the problems of the socialization of newcomers existing in social management in recent years,this paper uses the questionnaire method to study the dynamic relationship between the socialization of newcomers and the adaptation of old employees. Furthermore, the purpose of this research is to discuss this specific issue and expand the dynamic relationship between the socialization of newcomers and old timers by conducting a questionnaire survey in several local enterprises that have absorbed more new foreign employees.

By collecting the opinions of the same group of new and old employees in a company, summarizing and analyzing the data. Giving practical suggestions can help new graduates like me better adapt to the organization, and also help the organization to systematically train new employees and guide old employees after adoption, so as to retain excellent talents (new and old employees) and improve the performance of the company.

2. Methodology

In the research method writing section, we will comprehensively discuss the methodology of the study and how the questionnaire method was used to collect as valid data as possible, and explain the different elements of the research method and the implementation of the study.

The focus of this study is to understand the dynamic and interactive influence of the relationship between socialization of new employees and adaptation of old employees. If we choose employees in a medium-sized technology company as our research object, we may obtain more meaningful and accurate results. Medium-sized technology companies have many characteristics, and these companies usually have a more balanced combination of new and old employees than other types of companies, which corresponds to our research group, and it can provide a rich research data, and at the same time, in the medium-sized technology companies, the organizational hierarchy and the structure of departments are clear. The organizational hierarchies and departmental structures in mid-sized technology companies are clear and distinct, and studying these types of companies can help us gain insights into the socialization process and trust building of employees in dynamic environments (Ritchie et al.).

In this section, the sample is first introduced, followed by the data collection process, measurement elements, and data analysis scheme to provide a theoretical basis for data analysis for the study on the interaction among new employee socialization, veteran employee attitude, team trust, and organizational commitment. This study focuses on employees from various teams within a medium-sized technology company, specifically new hires (those employed for less than one year) and veteran employees (those with over three years of tenure). According to previous studies, the sample size of this study was between 30-500, to better determine the sample, we took measurements through the Gpower software and chose a margin of error of 5% and a confidence level of 95%, by referring to Krejcie & Morgan (1970), the calculations showed that for this study, the sample size was at least 82. However, the final number of collected questionnaires is subject to the valid questionnaires returned.

The questionnaire through a link or QR code that we created, and after completing the questionnaire they were encouraged to share it with their friends or others through a snowball recruitment method. Furthermore, a pilot test was conducted with 20 employees before the official study questionnaire was distributed and collected, which allowed us to identify corrections to the questionnaire. Feedback from the pilot testing was used to make necessary adjustments to the questionnaire. Questionnaires were distributed electronically to selected participants. The survey was open for a total of two weeks, during which follow-up reminders were sent to encourage participation. Respondents completed the survey online and their

responses were automatically recorded in a secure database. Participation was voluntary and all participants provided informed consent before taking the survey.

3. Implications for theory and practice

A call for a new way to explore the problems of international management, a vital research gap exists in our daily. It's no doubt that we should pay attention to. Through the analysis of data we collected, these findings underscore the importance of structured socialization processes and positive interactions between newcomers and veteran employees in fostering a trusting and committed organizational environment.

Based on the theory of :

- a. Social Identity Theory;
- b. Role Theory & Social Exchange Theory;
- c. Organizational Commitment Theory & Team Trust Theory

The three corresponding hypothesis are proposed:

H1 The degree of newcomer socialization positively affects team trust

H2 Veteran employees' attitude and feedback positively affect team trust

H3 Team trust positively affects employees' commitment to organization

Data and Analytic Plan

Stratified random sampling was used to represent both newcomers (under one year of tenure) and veterans (over three years). The regression and mediation analyses will be interpreted to explore the direct and indirect relationships among new employee socialization, veteran employee attitudes, team trust, and organizational commitment. Significant results will provide evidence supporting the hypothesis, whereas non-significant results will indicate the need for further investigation or alternative explanations. By following this analysis plan, we aim to gain a comprehensive understanding of the dynamics between new employee socialization, veteran employee attitudes and feedback, team trust, and organizational commitment. This will help identify key factors that influence team trust and commitment within an organization.

4. Finding and Results

A total of 160 participants were selected, including 60 newcomers and 100 veterans. After screening, 130 questionnaires were recovered, other 30 questionnaires are invalid. In the

amount of 130 questionnaires, including 67 males and 63 females, with 51.5% males and 48.5% females. (Due to space limitations, the specific methods and steps of data analysis will be omitted in this summary.)

Reliability analysis

We analyzed the results of the questionnaire for reliability five times, the first time is the overall reliability. The second time is the reliability of the measurement results of measuring new employees' socialization; the third time is the reliability of the results of measuring the commitment factor, the fourth time is the reliability of the results of the old employees' attitude factor; and the fifth time is the reliability of the results of measuring the team trust. Its specific measurement results are as follows:

Table 2 Reliability analysis

	Cronbach's Alpha	N of Items
Overall reliability	0.964	64
New employee socialization	0.961	22
Commitment	0.944	12
Attitude of long-term employees	0.951	15
Team trust	0.943	12

According to the results of the analysis, the overall reliability of the questionnaire, the Cronbach's alpha coefficient values of the measurements of socialization of new employees, commitment, attitude of old employees, and trust in the team are all greater than 0.6, which indicates that the reliability of the scale is good enough to be used for statistical analysis.

Factor analysis

The validity is usually tested by KMO metrics and determines whether the data set is ready for further factor analysis. After loading the data, the results are shown below:

Table 3 Factor analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.863
Bartlett's Test of Sphericity	Approx. Chi-Square	5307.396
	df	1176
	Sig.	0

The results of the analysis showed that the KMO statistic was 0.863, which is greater than 0.6, with a p-value of 0. Therefore, the original hypothesis was rejected, i.e., it was suitable for factor analysis.

Suggestions for employees and organization

For newcomers—Establish effective communication channels

For old timers—As a model and foster a positive work environment

For all employees— Respect to each other

For organization—Customized strategies for socializing new people

Through the data analysis and compared with the literature review of the below factors: new employees socialization, old employees' attitude, team trust, organizational commitment could be found it exists the relevant relationship.

To sum up, the data collected in this study supports the hypotheses proposed and is consistent with existing literature. Newcomer socialization positively affects team trust, veteran employees' attitudes and feedback are crucial for building team trust, and team trust significantly enhances employees' commitment to the organization. These findings underscore the importance of structured socialization processes and positive interactions between newcomers and veteran employees in fostering a trusting and committed organizational environment. In general, it exists the positive interaction between new and old employees which is promoted to cultivate the trust of the whole organization, and finally the employees are encouraged to establish commitment to the organization, that is, they are willing to stay and work actively for the organization for a long time.

In summary, the dynamic relationship between the socialization of new members and the adaptation of veterans is very important because it directly affects the operation and performance of the organization. Therefore, organizations should attach importance to and understand this relationship and adopt effective management methods. In short, through systematic social training and reward system for senior employees, the organization can establish a harmonious and efficient working environment, which undoubtedly has practical significance for long-term results and social development.

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MS0047: Study on the Potential of Sino-Japanese Trade Based on the Stochastic Frontier Gravity Model under the RCEP Framework

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Study on the Potential of Sino-Japanese Trade based on the Stochastic Frontier Gravity Model under the RCEP Framework

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Extended Abstract

To study the the potential of goods trade between China and Japan, this paper first searched the UN Comtrade database and collected and organized panel data on the import and export of goods between China and Japan from 2013 to 2022. Secondly, the competitiveness and complementarity of Sino-Japanese trade were further explored; Then, random frontier gravity models and trade inefficiency models were constructed and analyzed separately. The empirical results show that some relevant policy recommendations have been proposed to promote the development of trade between China and Japan and tap into the potential of trade between the two countries.

Keyword: RCEP, Trade complementarity, Trade potential, Stochastic frontier gravity model

1. Introduction

This paper calculates the trade competition index and complementarity index between China and Japan by collecting the relevant data from China, Japan, and RCEP (Regional Comprehensive Economic Partnership) member countries from 2013 to 2022, constructs a stochastic frontier gravity model and a trade inefficiency model, and studies the trade potential between China and Japan under the RCEP framework. The empirical analysis results show that China and Japan have complementarity in trade structure and high trade efficiency, but trade inefficiency is greatly influenced by free trade agreements,

monetary freedom, infrastructure, and tariff levels. Therefore, further creating a favorable trade environment between China and Japan can improve the efficiency of trade between the two countries.

2. Existing studies and gaps

The formal entry into force of the Regional Comprehensive Economic Partnership (RCEP) marks the birth of a high standard and high-quality regional free trade agreement in Association of South East Asian Nations (ASEAN) (Zainuddin,2020). Currently, RCEP has a profound impact on the recovery of the ASEAN economy and the integration of regional economies. Under the RCEP cooperation framework, the trade complementarity and competitiveness between the two countries have become the focus of attention for researchers. For example, Lin Qing-quan et al. (2021) studied the similarity and complementarity of agricultural product exports between China and other RCEP member countries using the Display Comparative Advantage Index of overall agricultural products, finished agricultural products, animal products, plant products, and animal and plant oil products. Chen Ji-yong and Yan Yi-chen (2019) investigated the trade potential of China and India with their major trading partners over a period of 10 years from 2007 to 2016. Wang Lin and Chen Shan (2019) looked into the trade efficiency and potential between China and the three countries of Bangladesh, India, and Myanmar in South Asia. Cai Yeping and Peng Hong (2023) discussed the export trade potential of aquatic products from China to eleven RCEP partner countries. The above works suggest that there is significant trade potential between China and RCEP member countries under the RCEP framework. Most of these research conclusions were obtained through the analysis of stochastic frontier gravity models. For example, Wang Lin and Chen Shan (2019) used panel data from 2007 to 2017 to study the trade efficiency of the Bangladesh China India Myanmar Economic Corridor using a stochastic frontier gravity model, and concluded that it is necessary to strengthen trade gravity and narrow the differences in trade potential between regions. Cai Yeping and Peng Hong (2023) collected data on China's aquatic product exports to eleven RCEP partner countries from 2008 to 2021, and constructed a stochastic frontier gravity model to analyses the factors affecting China's aquatic product exports.

However, scholars have rarely studied the trade potential between China and Japan after the implementation of RCEP. From 2013 to 2022, the proportion of bilateral trade between China and Japan to China's total foreign trade decreased by 1.85%, while China's import and export trade with the world increased by 51.7% during the same period. The bilateral trade between China and Japan showed an asymmetric development trend (Chen Hui, 2022). Based on this background, this paper used panel data of goods trade between China and Japan and their major trading partners from 2013 to 2022. By calculating the Sino-Japanese trade competition index and trade complementarity index, a stochastic gravity model and a trade inefficiency model are constructed to analyse the annual trend of trade potential between China and Japan.

3. Empirical analysis of trade potential and influencing factors between China and Japan

3.1. Random Gravity Frontier Model

Based on the above theoretical foundation, this paper constructs a stochastic frontier gravity model as shown in formula (4.1) to determine the potential and efficiency of goods trade between China and Japan, where β is the estimated parameter vector, and EXP_{ijt} , $PGDP_{it}$, $PGDP_{jt}$, POP_{it} , POP_{jt} and DIS_{ij} respectively represent the export value (calculated in current US dollars), per capita GDP (calculated in current US dollars), population size, and weighted geographical distance between China and Japan to their major trading partners. μ denotes the trade inefficiency and is the dependent variable. In addition, free trade agreements (FTA), liner shipping connectivity index (LSCI), customs clearance time (TIM), economic freedom index (IEF), monetary freedom index (MON), and total tariff level (TB) are set as explanatory variables. The definitions and explanations of the above variables are shown in Table 11.

$$\ln EXP_{ijt} = \beta_0 + \beta_1 \ln PGDP_{it} + \beta_2 \ln PGDP_{jt} + \beta_3 \ln POP_{it} + \beta_4 \ln POP_{jt} + \beta_5 \ln DIS_{ij} + v_{ijt} - \mu_{ijt} \quad (4.1)$$

Table 1 Definition and explanation of major variables

Variable	Variable name	Definition
Explained Variable	EXP_{ijt}	The export value of China and Japan to major trading partners, in billions of US dollars. Data source: UN Comtrade database.
	μ	Inefficient trade.
	$PGDP_{it}$	Per capita GDP of country i (in US dollars).

explanatory variable		Data source: World Development Indicators (WDI) released by the World Bank.
	$PGDP_{jt}$	Per capita GDP of country j (in US dollars).Data source: World Development Indicators (WDI) released by the World Bank.
	POP_{it}	Population size of country i (unit: 10000). Data source: World Development Indicators WDI released by the World Bank.
	POP_{jt}	Population size of country j (unit: 10000). Data source: World Development Indicators WDI released by the World Bank.
	DIS_{ij}	Weighted geographical distance between the two countries (unit: kilometres). Data source: CEPII database.
	FTA	Virtual variable of free trade agreement, where the importing country and China have a free trade agreement with a value of 1, otherwise it is 0. Data source: WTO RTA-IS database.
	LSCI	Shipping Connectivity Index of Importing Countries
	TIM	Import customs clearance time of country j during the period of t .
	MON	The degree of freedom of the importing country's currency. The higher the score, the higher the degree of freedom of the importing country's currency. Data source: American Heritage Foundation Economic Freedom Index.
	TRF	The overall tariff level of importing countries. Data source: Global Competitiveness Report WGI released by the World Economic Forum.

3.2. Analysis of Trade Efficiency and Potential between China and Japan

The trade potential is the ratio of actual trade volume to trade efficiency. The difference between trade potential and actual trade volume is called trade expansion potential. By sorting out the export and import volumes of Japan's foreign goods trade by industry, as well as calculating the trade inefficiency model through regression analysis, the efficiency and potential of China's export trade to Japan and Japan's export trade efficiency and potential to China were obtained. The results are shown in Tables 2

and 3. From Table 2 and 3, China's export trade with Japan is in a growing trend, and the potential for trade expansion is also increasing year by year and Japan's export trade efficiency to China was relatively low from 2013 to 2015.

Table 2 Estimation of China's Export Trade Efficiency and Trade Potential to Japan (2013-2022, in billions of US dollars)

Year	Efficiency of China's exports to Japan	Actual export	export potential	Trade Expansion potential	Relative value of trade expansion space	RCEP ranking
2013	93.68%	1501.326	1602.69	101.36	6.75%	3
2014	93.92%	1493.913	1590.57	96.66	6.47%	2
2015	93.12%	1356.164	1456.32	100.16	7.39%	3
2016	92.71%	1292.685	1394.29	101.60	7.86%	3
2017	92.99%	1372.589	1476.12	103.53	7.54%	3
2018	92.48%	1470.488	1590.04	119.56	8.13%	3
2019	92.80%	1432.445	1543.61	111.16	7.76%	4
2020	92.72%	1425.966	1538.00	112.03	7.86%	5
2021	85.39%	1646.263	1927.97	281.71	17.11%	5
2022	85.19%	1729.274	2029.91	300.63	17.38%	5

Table 3 Estimation of Japan's Export Trade Efficiency and Trade Potential to China (2013-2022, in billions of US dollars)

Year	Efficiency of Japan's exports to China	Actual export	export potential	Trade Expansion potential	Relative value of trade expansion space	RCEP ranking
2013	90.66%	1294.01	1427.39	133.38	10.31%	3
2014	89.14%	1263.61	1417.51	153.89	12.18%	2
2015	84.06%	1092.78	1299.97	207.19	18.96%	3
2016	86.67%	1138.30	1313.30	175.00	15.37%	3
2017	90.21%	1327.81	1471.92	144.11	10.85%	1
2018	91.25%	1440.33	1578.38	138.05	9.58%	1
2019	90.21%	1346.73	1492.94	146.21	10.86%	1

2020	91.74%	1413.99	1541.33	127.34	9.01%	1
2021	93.47%	1638.60	1753.10	114.50	6.99%	2
2022	92.10%	1445.39	1569.43	124.04	8.58%	3

4. Conclusion

The potential of goods trade between China and Japan was analyzed in depth using the stochastic frontier gravity model by collecting and processing multidimensional data on import and export trade volume, economy, geography, and trade policies among China, Japan, and RCEP countries. It concludes that the commodity trade complementarity index between China and Japan shows fluctuations or growth trends in certain categories.

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MS0049: What Factors Determine Product Stewardship in Organizations? – Developed vs Emerging Market Firms

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What factors determine product stewardship in organizations? – Developed vs Emerging Market Firms

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Abstract

Product stewardship is not just an important policy concern, but a significant non-market strategy for the firms to pursue as part of their competitive strategy. This empirical work seeks to provide insights into the organization factors that contribute to the success of product stewardship. Using configurational analysis, different patterns/combinations made of five key organizational factors are identified that result in product stewardship. The analysis shows that in different contexts, that is developed versus emerging economies, the factors playing significant role across various configurations are distinct. While environmental policy & management system is seen as necessary across configurations in the case of developed economies, supply chain management is prominently seen across patterns in emerging markets.

¹ Author names are listed in alphabetical order of their respective surnames; all authors contributed equally to the project.



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MS0052: Exploring the Relationship among Adversity Quotient, Emotional Intelligence and Adaptation

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Exploring the Relationship among Adversity Quotient, Emotional Intelligence and Adaptation

Paper for 2024 AIBSEAR Hong Kong Conference, School of Business, The Hang Seng University of Hong Kong

The submission contains only original work that has not been published elsewhere, and that it is not scheduled to be published anywhere

ABSTRACT

This study undertook surveys to discover the relationships among adversity quotient, emotional intelligence, and students' adaptation. Total valid questionnaire sample is 336. This research finds the adversity quotient in terms of control and ownership factors have significant influence on adaptation. Emotional intelligence has significant influences on adaptation. Adversity quotient in terms of control & ownership factors, unable reach factors, external reach factors and mixed factors have significant relationships with emotional intelligence.

Keywords: Adversity Quotient, Emotional Intelligence, Adaptation.

1. INTRODUCTION

Knowledge is actively created by learners based on their pre-existing cognitive structures (Piaget, 1971). Piaget (1971) paid more attention to what was going on within the learner's thoughts rather than how they behaved. Bruner (1961) thinks learners develop their own knowledge by organizing and classifying information using a coding system. Discovering a coding system rather than being informed by a teacher was the most efficient method.

Humanistic instructors think that in the process of learning, knowledge and feelings go hand in hand. Both affective learning and cognitive learning play an important role in people's learning. Courses and activities should focus on the entire learner, including their intelligence and emotions. Emotions have an important influence on an individual's behavioral judgment, and have an impact on an individual's cognition, motivation, and behavior (Smith & Lazarus, 1990). Emotional maturity is the specific manifestation of emotional intelligence, emphasizing the reasonable and appropriate management and control of emotional performance. The cultivation of "emotional intelligence" is an important issue in personality development.

Skinner (1950) holds that learning is a result of alteration in overt behavior. Behavior changes are the outcome of an individual's reaction to environmental events (stimuli). Thorndike (1898) thinks learning is a phenomenon that generates connections between one event and another occurrence, which is referred to as the stimulus with reaction. Stimulus is a change in the external environment that signals the organism to react and act. Thorndike's (1899) learning theory is often known as connectionism or association theory.

Rogers (1969) presented the concept of two forms of learning which were cognitive and experiential. The hierarchy of needs is Maslow's (1943) observations of humans' innate curiosity and the stages of growth. It is split between deficiency needs and growth needs. Experiential learning is an active process in which learners acquire knowledge via inquiry and observation (Rogers, 1969). Learning occurs from the results of both triumphs and failures, and it assists pupils in developing new abilities, attitudes, and problem-solving approaches.

Social learning theory (Bandura, 1977a; 1977b; 2002) emphasizes the importance of observing, modeling, and imitating the behaviors, attitudes, and emotional reactions of others. It emphasizes the influence of behavioral outcomes as well as the influence of individual cognitive beliefs, and believes that the individual, behavior, and environment interact and influence each other. Bandura's (1977a; 2002) suggests that the individual's interest in whether he or she has the confidence in completing the learning activity is the main factor affecting motivation. Therefore, if students' self-efficacy is increased, they will be able to face each challenge with a higher level of confidence and a more proactive attitude.

Individual needs to adjust themselves while interacting with others in their working environment that can be regarded as adaptation. Lacking the ability to adjust to school will cause the high prevalence of the school dropout (Gabriela, 2010). Clinciu (2012) discovered a negative correlation between college adjustment and stress. The emotional-affective component was shown to have the strongest association. Students have a difficult time adjusting to college who will have more pressure and anxiety, specifically in the emotional sector. Elias et al. (2011) have found that academic achievement has negatively connected with stress. Daniel et al. (2018) have found that stress has a detrimental influence on students' academic performance. Páramo et al. (2015) have discovered that students with poorer academic and institutional adjustment to college performed worse in academic performance than students with greater level of adjustment.

Adaptation aids in self-directed intellectual, emotional, social, and physical growth and development. It refers to the psychological process through which people deal with the demands and obstacles of daily life. It is concerned with how a person adjusts to his or her surroundings and life's demands. This encompasses how a person interacts with people as well as how a person manages his duties and inner emotions. Adaptation aids in managing external expectations, pressures, wants, and desires. Satisfactions, a feeling of meaning and purpose, are all linked to the ability to adapt (Martin et al., 2013).

According to Berndt (2002), people who have excellent friendships exhibit more prosocial

conduct, have higher self-esteem, have less emotional problems, have a better attitude, and reach higher levels of accomplishment. Rai (2009) has showed that there is a positive correlation between adaptation and achievement. Children's social adaptation had a contribution to the achievement (Chen et al., 2011). Adaptation is substantially linked with accomplishment (Mathur, 2010). It is interesting to know the degree of emotional intelligence, adversity quotient, and their influences on students' adaptation, however.

What are the basic qualifications of applicants? Some of leading organizations apply emotional intelligence (EQ) and/or adversity quotient (AQ) assessment. Emotional intelligence and adversity quotient assessments are important for organizations to know if their applicants for the jobs' positions are ideal personnel to hire and in developing their own growth. Several educational institutes also applied emotional intelligence and/or adversity quotient to know their members. In addition, EQ is regarded as a series of emotions, personality and interpersonal capabilities that influences one's capability to cope with the stress of the need in the environment (Bar-on, 1997). Therefore, EQ is one of basic qualifications for an organization to screen their employees for doing particular jobs.

Emotional intelligence (EQ) is regarded as an individual's ability to perceive and distinguish one's own and others' emotions, then process and use emotions, and guide the individual's thinking and actions (Salovey & Mayer, 1990). Goleman (1995) further regards EQ as an ability to maintain self-control, enthusiasm, persistence, and self-motivation. People with high emotional intelligence are more aware of their own emotions, have empathy and high self-esteem, are more able to live in harmony with others, are more satisfied with their own lives, and are more able to maintain a positive attitude towards life.

The concept of Adversity Quotient (AQ) is about the capacity of individual to bounce back from adversities (Stoltz, 1997). AQ is indicators of a person's ability to cope with adversity. According to Phoolka and Kaur's (2012) observation, AQ presents a new approach gaining research interests in the organizational field. Paramanandam and Shwetha (2013) have explored the relationship between AQ and demographic factors (such as age, and income group). Somaratne, et al. (2019) have explored the effect of adversity quotient sub-dimensions on employee stress. Past studies on AQ are in the organizational context (Langvardt, 2007), paying less attention to academic fields.

AQ refers to an individual's ability to understand, manage, and regulate their emotions, as well as the emotions of others. Such intelligence abilities as empathy, self-awareness, self-regulation, motivation, and social skills (Rowinski, 2023) are all included. Individual with high AQ can navigate complex and challenging situations with ease. Particularly, individuals with high AQ

are often able to handle stress and pressure with ease, which enables them to perform at their best even in the most difficult situations.

Attention can be paid to explore the impacts of both emotional intelligence quotient and adversity quotient on students' adaptation. With sufficient emotional intelligence and/or adversity quotient, students may be able to overcome all the difficulties they currently face. However, there is an opportunity to examine the relationships among AQ, EQ, and adaptation.

This study assumes that emotional intelligence, adversity quotient, and adaptation have significant relationships. However, this research tries to explore the relationship among emotional intelligence, adversity quotient, and adaptation by conducting questionnaire surveys focusing on first-year students studying in Taiwan. The research questions are: What are the influences of emotional intelligence on adaptation? What are the influences of adversity quotient on adaptation? What is the relationship between adversity quotient and emotional intelligence?

The overall research objective is to explore the relationships among emotional intelligence, adversity quotient, and adaptation. Research issues are: (a) to examine the influences of emotional intelligence on adaptation, (b) to examine the influence of adversity quotient on adaptation, (c) to examine the relationship between adversity quotient and emotional intelligence.

2. LITERATURE REVIEW

This section focuses on literature review in terms of adversity quotient, emotional intelligence, and adaptation.

2.1. Adversity Quotient (AQ):

The adversity quotient (AQ) profile was developed by Stoltz (1997, 2000a, 2000b, 2015). Stoltz (2015) integrated grit, resilience, and human interface with adversity. AQ Profile is with four dimensions in terms of control, ownership, reach, endurance. English and Chinese AQ profile were undertaken, and high reliability and validity of the observed sample AQ profile (4472 individuals from 39 countries, and 1858 individuals from 7 countries) were showed. Four dimensions of the AQ Profile were tested by confirmatory factor analysis that the results showed the four subscales are related, but still measure unique concepts.

Adversity quotient can be interpreted as individual's response to adversities or challenges faced (Singh & Sharma, 2017). Ability to deal with adversities can accumulated through life experience (Shen, 2014). Individuals with higher levels of AQ can cope better with adversities

by turning difficulties into opportunities (Stoltz, 1997).

According to the observations of Stoltz, (1997 & 2000a) and Stoltz & Weihenmayer (2008), the AQ profile originates from more than 1,500 studies spanning various subfields of psychology, neurology, biochemistry, psychoneuroimmunology, endocrinology, cultural anthropology, molecular genetics, and neuropsychology, etc. The assessment of adversity quotient is intended to provide more insights into both the quality and quantity of individuals' hardwired pattern of response to adversity. Stoltz (2000a) and his team of researchers still have ongoing improvements and evolution of the AQ assessment.

The AQ profile is currently used for the applicant screening and the development for establishing a vital baseline for growing one's AQ by many famous leading industry and educational organizations such as: Amazon, JP Morgan, AT&T, P&G, Deloitte, Marriott, Massachusetts Institute of Technology (MIT), Harvard Business School. Corporate or educational organizations typically use the AQ profile to screen applicants, develop leaders, or to transform their cultures, people and results (Stoltz & Grant, 2019).

The items used to assess adversity response patterns include the four CORE subscales (dimensions) Control, Ownership, Reach, and Endurance, which together comprise and describe an individual's AQ (Stoltz, 1997; 2000b). AQ assessment (Stoltz, 1997) covers the subject's perception of and response to a diverse series of hypothetical adverse events. Items are scored using interactive 10-point Likert scales. For example, one statement reads, "You miss an important appointment...To what extent can you influence what happens next? (1) not at all » (10) completely." Another question reads, "You suffer a financial setback... How long will this situation negatively affect you? (1) Forever » (10) Momentarily, if at all." Total scores for each subscale are determined by the sum of the scored items within that scale. Table 2.1 presents the four dimensions of AQ.

Table 2.1 The Dimensions of Adversity Quotient Profile

Dimensions	What it is	What it determines
Control	The extent to which someone perceives they can influence whatever happens next.	Resilience, health, and tenacity
Ownership	The likelihood that someone will actually do anything to improve the situation, regardless of their formal responsibilities.	Accountability, responsibility, action, and engagement

Reach	The extent to which someone perceives an adversity will "reach into" and affect other aspects of the situation or beyond.	Burden, stress, energy, and effort; it tends to have a cumulative effect
Endurance	The length of time the individual perceives the situation / adversity will last, or endure.	Hope, optimism, and willingness to persevere
Adversity Quotient	The wear and tear factor. How well one holds up - the degree to which someone is worn down or becomes stronger over time.	

Source from Stoltz & Grant (2019). AQ Profile 10.0 in 2019 Technical Report, Grant Consulting, p.3.

The items used to assess adversity response patterns include the four CORE dimensions in terms of control, ownership, reach, and endurance, which together comprise and describe an individual's AQ (Stoltz, 1997). AQ assessment (Stoltz, 1997) covers the subject's perception of and response to a diverse series of hypothetical adverse events. Control involves an individual perceives as having control or influence over adversity situations (Stoltz, 1997). Individual has control influences on the direction of the action, level of effort, and perseverance. A person with strong control aspect tends to be proactive in adversity situations and can turn adversity into opportunity (Stoltz, 1997). Such person will exert more effort with higher levels of resilience and perseverance in attaining assigned tasks successfully (Hung & Chin, 2013). Ownership involves the degree of accountability a person feels to improve the outcome of adversity situations (Stoltz, 1997). With higher AQ, a person will feel accountable for the adversity situations to face them with responsibility. People learn from past experiences, change their strategy of dealing with the situations from time to time, and take necessary action to complete the tasks. People are responsible for their own deeds, and make the outcomes into learning opportunities. Reach is about a person perceives the influences of adversity into other areas of life (Stoltz, 1997). A person with higher AQ does not let adversity reach other facets of life. Adversity is considered as specific and limited to one situation. People are well prepared to deal with adversity for they feel empowered (Stoltz, 2000). Endurance involves an individual's perception of the duration the cause of adversity and how long adversity will last (Stoltz, 1997). People with high AQ perceive adversities as temporary and will have solutions to overcome them. Such people are optimistic and energetic in coping with adverse events (Stoltz, 2000). Resilience, longevity, performance, and response to change are found to be predictable with respect to an individual's AQ level (Phoolka & Kaur, 2012).

According to Singh & Sharma (2017), when undesirable or trying circumstances result in

tension or strain either mentally or emotionally, it is stress. Stress can be from physical like some threat or danger to emotional such as tension or worry at job. These conditions may be related to overload of work leading to burnout or lack of coordination among the team causing bottlenecks and unnecessary delays. In Strivastava and Singh's (1981) occupational stress's twelve dimensions, including role overload (too many expectations being communicated), role conflicts (disagreement over the goals to attain or the methods to be used), and poor peer relations, often lead to unpleasant and explosive situations that can explain why team members often have conflicts and stresses.

Prakaew and Leesattrupai (2017) find that increase in AQ decrease in stress. Higher AQ levels lead to lower stress levels. Shen (2014) regards that AQ develops the attitudes and capability of a person to deal with stressful situations. Team members in their coordination to complete team tasks would have opportunities to face stressful situation. Especially, students participate in teamwork to finish assignment and face how to communicate with their team members and how to share work loadings. A lot of unexpected stressful situations would occur. According to Stoltz (2000), a person with higher AQ levels can control events that create adverse circumstances, has sense of accountability towards the outcome of the adverse situation, not allow the effect of adversities to reach other areas in life, and sees adverse events as temporary. Somaratne, et al. (2019) think that perceived stress can be predicated through individual's AQ. Higher AQ levels lead to lower stress levels. AQ allows a person to deal with stressful situations (Shen, 2014). Trevisani (2015) has observed undergraduates that increase in age decrease in perceived stress of students.

Singh & Sharma's (2017) empirical findings reveal that there is a significant correlation between adversity quotient and occupational stress which implies that IT professionals in any adverse situation can successfully manage their occupational stress. They also have found that role over-load, role conflict, under participation, poor peer relations, and strenuous working conditions are significantly correlated with adversity quotient. They think that if the IT professional work towards enhancing their adversity quotient, then they will have a significant work life balance, be more satisfied, contented, motivated and above all managing themselves in adverse situations and therefore coming out successfully and thus handling the various stress which comes from a dynamic, competitive environment will become easy and coping up with it less difficult.

Somaratne, et al. (2019) have investigated the relationship between adversity quotient (AQ) and levels of perceived stress of middle-level managers employed in the Sri Lankan Non-Governmental Organizational sector. They have found that age, work experience, and academic qualifications significantly influence the level of AQ. They also find that dimensions of AQ can

predict the variance in perceived stress. Their empirical findings signify that stress model can consider addition of AQ in future research, and AQ can serve as an important factor in training and development, selection process, and performance management. Somaratne, et al. (2019) also think that AQ is a mental capacity that extends beyond the masculine and feminine traits of people because other researchers (Bantang et al., 2013; Huijuan, 2009) and their empirical findings show gender has no significant influence on the level of individual's AQ. On the contrary, De Gulan, et al. (2013) have found that women have higher mean scores of AQ compared to men.

Huijuan (2009) finds age has no significant influence on AQ. On the contrary, the findings of Somaratne, et al. (2019) and Paramanandam & Shwetha (2013) show that increase of AQ with age. Their findings confirm that experience and encounters have possibly made individuals with older age more resilient and better able to cope with adversity, and thus superior to individual with younger age. The more difficulties an individual experiences, the more that individual learns how to deal with them (Stoltz, 1997). Individuals participate teamwork would encounter a lot of difficulties and hardship, and conflicts may occur, they will need to learn a lot of efficient communication skills to cooperate with each other to complete team tasks.

Matore, et al. (2015) have found that those who perform better in the academic field are also found to be intelligent in dealing with adversities. Tripathi (2011) has identified a significant difference in adversity quotient based on academic qualifications that Somaratne, et al. (2019) also have the same findings. Bantang et al. (2013) have different observation from the above that they find academic qualifications have no such influences on AQ.

Tian & Fan (2014) have applied adversity quotients and environmental variables to test career adaptability in student nurses. They have found that student nurses' adversity quotients, individualized clinical learning environment, and family social support associated positively with the degree of career adaptability, even after multiple adjustments. Career adaptability scores high were student leaders. Apparently, adversity quotients are relevant to students' adaptation.

However, literature indicates the opportunity to study adversity quotient's influences on adaptation. In addition, this research attempts to apply the concept of adversity quotient to observe the relationship with emotional intelligence.

2.2. Emotional Intelligence:

Emotional quotient or intelligence (EQ) is self-awareness, controlling emotions, inspiring oneself, sympathy, and relationship management (Salovey & Mayer, 1990). Bar-on (1997)

regards emotional intelligence as a series of emotions, personality and interpersonal capabilities that influences one's capability to cope with the stress of the need in the environment. Emotional intelligence includes an indication of an individual's mind and feeling, skills, opinion, and how to apply the moods and emotional intelligence (Wong & Law, 2002).

Emotional intelligence (EQ) is a hot issue among academics and experts in the fields of psychology, education, and management (Shapiro, 1997; Weisinger, 1998). Emotional intelligence refers to the ability to recognize emotional problems and changes in oneself and others, and involves managing one's emotions, making wise decisions, developing good interpersonal relationships, dealing with different stresses, and sustaining life motivation. Past literature has identified three representative perspectives on the interpretation of emotional intelligence: cognitive ability (Mayer and Salovey, 1997), focuses on performance-oriented emotional intelligence (Goleman, 1995), and mental health or personality orientation (Bar-on, 1997, 2004, 2006a, 2006b, 2007).

Mayer and Salovey's (1997) emotional intelligence framework contained three levels: correctly assessing and expressing the emotions of others, properly regulating one's own and others' emotions, and using emotions to plan creativity and motivate actions. Goleman's (1995) emotional intelligence theory explained the importance of five emotional competencies to people. Firstly, people must have the ability to recognize their own emotions, to be aware of their own inner-feelings, personalities, preferences, motivations, desires, and basic personal values. The second is to be able to effectively manage one's emotions and know how to self-regulate negative emotions. The third is to know how to self-motivate, to self-propel after facing the goals set by oneself, and to improve personal efficiency. The fourth ability is to "put yourself in the shoes" of others to understand their feelings, communication between people not only rely on words, but also through some micro-expressions and body language to understand each other. The last is to learn good social skills and build good interpersonal relationships.

The concept and theoretical model of emotional intelligence proposed by Bar-on (1997) is the sum of a series of emotions, personality and interpersonal abilities that affect people's ability to cope with the pressure of environmental needs. Emotional intelligence is an important factor that determines whether a person can succeed in life, and directly affects a person's entire mental health. Bar-on (2004, 2006a, 2006b, 2007) further states that emotional intelligence is the social knowledge and ability to affect a range of emotions that effectively respond to environmental demands. To understand the Bar-on model, firstly it's necessary to mention the Emotional Quotient Inventory (EQ-I) which is helpful to form the model. EQ-I operationalizes the Bar-On model. EQ-I includes 133 short statements and uses a 5-point scale with a written answer style that ranges from "very often true of me" (5) to "very seldom true of me" (1). In

EQ-I, it consists of 5 composite scales that composite 15 sub-scales: Intrapersonal (Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, and Self-Actualization); Interpersonal (Empathy, Social Responsibility, and Interpersonal Relationship); Stress Management (Stress Tolerance and Impulse Control); Adaptability (Reality-Testing, Flexibility, and Problem-Solving); and General Mood (Optimism and Happiness).

In this study, the EQ-I from Bar-On model (2004, 2006a, 2006b, 2007) is adopted, including the scale of adaptability in terms of problem-solving to measure the influence of emotional intelligence on students' adaptation due to the fact that students who can objectively corroborate one's feelings and thoughts with reality, modify their emotions and thoughts to new conditions, and tackle challenges of a personal and interpersonal nature efficiently resulting in good adaptation in the academic life. In other words, these indicators aim at how students think about adjusting to reality, how they deal with the problems they face, and how to solve out the problems in their life of studying.

Prati et al. (2003) think it's possible that EQ is determined in different cultures. Also, EQ can cause different behavior in various cultures (Law et al., 2004; Markus & Kitayama, 1991; Elfenbein & Ambady, 2003; Marsh et al., 2003; Tsai & Chentsova-Dutton, 2003). Yet, studying the meaning of EQ (Salovey & Pizarro, 2003), it is crucial to realize the utility of "accurately and adaptively". It is an ability to adapt to one's emotion and express most appropriately in cross-cultural interactions. Gorji (2018) and Putranto et al. (2018) found that EQ had a positive and significant relationship with cultural intelligence. Emotionally intelligent activities are perceived as effective depending on the social and cultural settings (Kim et al., 2008; Matthews & Zeidner, 2000). Offermann and Phan (2002) have indicated that intelligence-descriptive skills are culturally specific. Mayer & Geher (1996) and Mayer et al. (2000) define emotional intelligence abilities in terms of culture, which is a collectively determined social context. Furthermore, being high in cultural intelligence entails being able to modify notions, which is vital for those who have a high EQ. These abilities also entail challenging one's own preconceptions about another's emotional expression, which may be related to the idea of "thinking about thinking," which is connected to the aspect of cultural intelligence (Earley & Peterson, 2004). The capability of the sense and understanding emotion is required because emotion detection necessitates accurate processing of emotional stimuli.

Knowledge received via cultural experiences contains emotional rules and performance in different cultures (Ang et al., 2004). This information helps in determining people's capability to understand their emotions correctly. It seems that how to effectively interpret and categorize emotions will improve one's skills to notice and comprehend emotions (Salovey & Pizarro, 2003). On the other hand, knowledge is learned from encounters.

Some of the capability used are the same as those used in EQ, such as taking proper response and being adaptable in one's actions, both verbal and nonverbal (Ang et al., 2004, 2007; Earley & Peterson, 2004; Earley et al., 2006; Thomas, 2006). This is the same as EQ ability involved in their emotion handling, which includes adequate emotion regulation (Salovey & Pizarro, 2003) and successful control of others' emotions (Mayer et al., 2002).

EQ was substantially connected with willing to try, which is presumably a fundamental part of wishing to know more about the culture (Day & Carroll, 2004). As a result, if being willing to try new things improves both EQ and cultural intelligence. Ghaonta & Kumar (2021) indicate that EQ is a theory that expresses an individual's ability to control motivation, and to show sympathy and energy confronted with the adversity while remaining resilient and adaptable.

Emotional intelligence abilities and competencies are critical to success, and there are substantial positive connections between emotional intelligence and adaptation. Emotional intelligence affects a student's social adaptation (Engelberg & Sjoberg, 2004). A statistical significance link between emotional intelligence and personal traits, and satisfaction of the social connection is discovered. Adeyemo's (2005) findings showed that emotional intelligence and general student adaptation were correlated. Within first-year university students, Abdallah et al. (2004) discovered a significant and positive correlation between emotional intelligence and academic adaptation. Chen et al. (2006) discovered that emotional intelligence and life adaptation had a linearity. Safavi et al. (2008) found that emotional intelligence and socio-emotional adaptation had a substantial relationship. Emotional intelligence is substantially connected with social adaptation and academic adaptation (Ishak et al., 2011). Punia and Sangwan (2011) and Patel's (2013) studies discovered that there was a substantial correlation between emotional intelligence and children's adaptation. Ogoemeka (2012) demonstrated that there were substantial differences between emotional intelligence and life adaptation. In Thilagavathy's (2013) research, adaptation and emotional intelligence were proved to have a greater linear association. Adaptation and emotional intelligence were proved to have a greater linear association. Therefore, EQ can be asserted to have significant influence on students' adaptation.

Emotional intelligence has become a significant predictor of the achievement related to the academy (Fernandez et al., 2012). Students who act better among examinations and assignments got a high degree of emotional intelligence (Chew et al., 2013). EQ is a capability to realize, to access and to create ideas, to control feelings, and to deal with emotions, and students have the passion of learning to enhance academic progress (Mayer & Salovey, 1997). According to Preeti (2013), emotional intelligence is important to education, lack of emotional

intelligence implies a weak characteristic and people can't develop relationships in schools. There is a causation between emotional intelligence and the achievement of academic and professional performance (Romanelli et al., 2006). Emotional intelligence is utilized to evaluate the academic performance at various school degrees (Billings et al., 2014; Reyes et al., 2012), high school (Costa & Faria, 2015), and college (Parker et al., 2004b). The findings of Bar-On (2007) and some studies (Bar-On, 1997, 2004, 2006a, 2006b; Bar-On et al., 2006) show a significant relationship between emotional intelligence and academic performance. Moreover, EQ is linked with academic achievement (Parker et al., 2004a). In conclusion, emotional intelligence is seen as one of the most basic elements of one's personality, and it plays a necessary role in regulating people's behavior. The focal point is about emotion awareness and observation, relationship between people, academic accomplishment, and the adaptability of the study.

According to Verma et al. (2017), there exists the relationship between emotional intelligence (EQ) and adversity quotient (AQ). Adversity quotient is the ability of a person to manage high stress levels and ability to work efficiently in the adversity. They also define emotional intelligence as the ability of the person to understand their own and other people's emotions and feelings. Therefore, it is reasonable to assume there must exist a significant relationship between EQ and AQ in the study.

Coetzee and Harry (2014) have used emotional intelligence as a predictor of employees' career adaptability. They find that emotional intelligence positively predicts career adaptability. Emotional functioning supports the display of career adaptability capacities. Managing individual's emotions enhances career concern and overall adaptability. This research shows emotional intelligence and adaptability are crucial psychosocial meta-capacities for successful adaptation in various spheres of life. Therefore, it can be assumed that emotional intelligence has significant influences on students' adaptation as well. The importance of developing individual's emotional intelligence for strengthening adaptation capability.

2.3. Adaptation

When people need to shift to new environments, they will face adaptation process. A new setting at a university, can elicit a variety of emotions in first-year students. As a result, the first-year students may be both exciting and challenging (Habibah et al., 2010). As students acclimate to the academic, social, personal, and lifestyle demands that the university brings, they will get apprehensive (Abdullah et al., 2009).

There are three aspects of the adaptation, which are general adaptation, job adaptation, and interaction adaptation (Black, 1988, 1990; Black & Stephens, 1989; Wu & Ang, 2011). Students

and the labors will face the challenges about general and interaction aspects, but in job aspects, students' adaptation is related to the learning conditions in schools, and labors' job adaptation is about the working conditions in the company.

General adaptation consists of living conditions, facilities, and the transportation in the local environment. In another words, an adaptation is that people face to the new challenge which includes climates, house living, and shopping dimensions. Interaction adaptation refers to the interpersonal interactions between individuals and local people, including teachers, classmates, etc., that may occur due to value and language barriers. Job adjustment is about students' adjustment to the academic issue.

In the field of cross-cultural studies, adaptation and adjustment are both commonly found in the literature, and the term adaptation is used in this study. Researchers (Kim & Slocum, 2008) have found that individual-level characteristics such as characteristic trait, capability, expertise, sexuality, relationship status, previous foreign experience, and local language proficiency are strong predictors of adaptation.

Adaptation refers to a condition in which a person who is gradually able to adapt, and the conflict with the demands of the environment gradually decreases, and resulting in a tendency for attitudes and behaviors (Berry et al., 1987). Adaptation is not only the psychological state of an individual, but also includes changes in cognition, attitude, and behavior; and adjustment is a long-term process. Klepeis et al. (2001) point out that many terms have been used in adaptation research, such as international adaptation, cross-cultural adaptation, and expatriate adaptation, all of which describe the level of psychological comfort when an individual enters a new environment and faces different cultural feelings. Ying (2005) categorized the stress associated with adjusting to different cultures into five major dimensions: physical, biological, social, cultural, and functional. Physical stressors include climate, unfamiliar environment, accommodation, and safety; biological stressors include food and illness; social stressors include missing home, friend and family, feeling alienated from others, difficulty making new friends, and loneliness; cultural stressors include differences in cultural values between countries and facing racial discrimination; functional stressors include work or schooling, finances, and transportation.

Torbiorn (1982) mention that adaptation includes local transportation, climate, shopping, entertainment, and general adaptation to life. In addition, Aycan and Berry (1996) state that adaptation abroad involves maintaining good mental and spiritual health, emphasizing different aspects of life satisfaction, having good relationships with local people, verifying effective job performance, and demonstrating positive attitudes toward the new job role. According to Searle

and Ward (1990), cross-cultural adaptation includes socio-cultural adaptation and psychological well-being. When a person is in an unfamiliar environment, and the norms and behaviors used there are unfamiliar and confusing to them, the person feels stressful. If cross-cultural issues can be handled well, it can also reduce conflict and stress in work and non-work situations and increase psychological comfort and ease in cross-cultural situations. Thus, adaptation is the degree to which an individual feels in harmony with the environment, and the intercultural adaptation is the result of the interaction between the individual's own (psychological and physiological) opinion and the social culture.

In Jain's (2017) findings, it shows that there is a positive relationship between adaptation and academic learning outcome. Students who have the better adaptation in house living, health, social relationships, emotional issues, and school issues, have better academic learning outcome. Parents and teachers should concentrate on students' adjustment to their new surroundings. Ease and satisfaction with one's surroundings transform into adjustment, which is beneficial to academic success. According to the researchers (Burgess et al., 2009), poor college adaptation is linked with the poor academic learning outcome, low graduation rates, and later-life failure. It's consequently perplexing that majority high school graduates have intellectual and social challenges that prevent them from adjusting to their new university environment. According to Burgess et al. (2009), failure to tackle the greater issues faced by students throughout the transition from secondary to higher education has an influence on learning outcomes.

Education is not only including learning facts and skills (cognitive outcomes) but also understanding how the world operates, and developing a worldview that guides behavior and shapes how individuals need and use knowledge (Duque & Weeks, 2010). The expected academic outcomes show the more clearly cognitive goals, whereas the non-academic outcomes show the more general results (affective outcomes) of the student's complete educational experience (value, aim, notion, self-perception, worldview, and performance).

Students studying in Management College normally involve in teamwork tasks. Team effectiveness (McGrath, 1964) can be measured by quality, problem-solving, mistakes reducing, work satisfaction, team's cohesiveness, and attitude changes. Nieva, et al. (1978) use team members' characteristics, team characteristics, and task characteristics and demands to measure team performance. Jewell and Reitz (1981) have indicated the importance of team interaction process (in terms of communication, decision making, influence power, cooperation and competition) in influencing team effectiveness. Above research points out the importance of interaction with others, and individual capability and personality can influence teamwork performance. Individual has good interaction with their peers that can increase cohesiveness of their teamwork. According to the observation of Zenger and Laurence (1989), the ages of team

members are the same, there will be more interaction between them in their leisure time. The greater differences in their age, the less communication frequency. The higher homogeneity of team members, the better communication interaction.

Many literatures indicate that task conflicts will raise team performance (Amason, 1996; Amason & Schweiger, 1994; Ancona & Caldwell, 1992; Hoffman & Maier, 1961; Jehn, 1994; Putnam, 1993; Tjosvold, 1986). When task conflicts show up, this situation would push team members to collect more information for understanding the reasons of problems, to have deep consideration on arguable viewpoints, to propose better solutions for facilitating communication in solving potential problems, to clarify misunderstandings, to exchange information, and to increase work recognition and understanding. These task conflicts would lead to better team performance.

Team commitment and cohesiveness are popular separate research subjects. Cohesiveness is mutual willpower and power, which can gather team members together for paying their mental and physical efforts, and work forces for striving for reaching team targets (Festinger et al. 1950). Mikalachki (1969) indicates team cohesiveness has positive relationship with team members' social contact and friendship. Higher social contract and good friendship, higher team cohesiveness can be asserted from this research findings. Individuals' capability, knowledge, and personality have significant influences on teamwork effectiveness (Jewell and Reitz, 1981). Good adaptation can be found from the positive interaction with the fellows from undertaking the same tasks together.

Regarding national culture factors, individualism culture allows different viewpoint openness expression, and regards this kind of behavior will not endanger social relationship. In collectivism culture, people obey an order and emphasize harmony, regard task conflicts as violation and emotional provocation and unacceptable (Cai & Fink, 2002; Hui & Triandis, 1986; Nibler & Harris, 2003; Shenkar & Ronen, 1987). Nibler and Harris (2003) find American task conflicts have positive relationship with team effectiveness. Westwood et al. (1992) find Chinese in assigned task try to avoid confrontation, and emphasize maintaining harmony relationship.

The measurement of students' adaptation is related to students' interaction in adaptation in terms of interpersonal interactions between individuals and local people, including teachers, classmates, etc., that may occur due to value and language barriers. The study of Safi'i opens a new paradigm for studying the adversity quotient and its implication for other educational aspects. Jung (2017) has paid attentions on the relation between adversity quotient and stress in university student. Aung and San (2020) have found that higher adversity quotient, the lower

academic stress, and male students have higher academic stress than female students.

Four CORE dimensions (abilities) of adversity quotient are in terms of control, ownership, reach, and endurance (Stoltz, 1997), which together comprise an individual's AQ. Emotional intelligence comprises individual problem-solving capability (Bar-on, 1997). Therefore, it is reasonable to assume individuals' characteristics in terms of AQ and emotional intelligence (EQ) have significant influences on adaptation. Rahayu's (2021) research result of adversity quotient and adaptation ability shows that there is a significant relationship between adversity quotient and the self-adaptation ability of students during the Covid-19 pandemic. Cando & Villacastin (2014) and Daloo (2015) have discovered the relationship between adversity quotient (AQ) and emotional quotient (EQ). So, it can be asserted that adaptation can be influenced by AQ and EQ variables. Daloo (2015) has particularly found that Control of AQ dimensions and age showed a significant difference, and older respondents perceived control over adversity than their younger counterparts, and there is significant correlation between the AQ dimensions (reach) and the EQ (skill, emotional self-management). Zao et al. (2022) have provided a deeper understanding of the relationships between trait emotional intelligence and life satisfaction and adversity quotient and life satisfaction, and how specific trait EQ and AQ facets related to individuals' life satisfaction. From above literature review, this research has the following hypotheses:

H1: Adversity quotient has significant relationship with emotional intelligence.

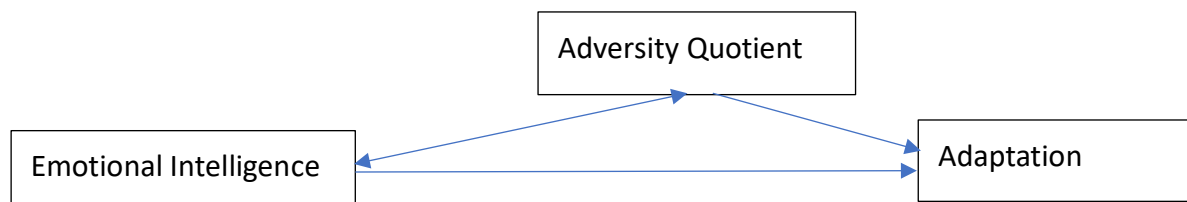
H2: Adversity quotient has significant influence on adaptation.

H3: Emotional intelligence has significant influence on adaptation.

3. RESEARCH METHODOLOGY

This section shows research framework, operational definition of variables, variable measurement, observation population and sample frame, and measuring methods.

3.1. Research Framework:



Research Hypotheses are summarized as below.

H1: Adversity quotient has significant relationship with emotional intelligence.

H2: Adversity quotient has significant influence on adaptation.

H3: Emotional intelligence has significant influence on adaptation.

3.2. Operational Definition of Variables

Regarding adversity quotient, AQ is the sum of a series of control, ownership, reach, endurance abilities that affect people's perception of and response to a diverse series of hypothetical adverse events (Stoltz, 1997). Regarding emotional (quotient) intelligence, EQ is the sum of a series of emotions, personality and interpersonal abilities that affect people's ability in problem solving to cope with the pressure of environmental needs (Bar-on, 1997). Regarding adaptation, it includes adaptation to the speaking and interact with classmates on a day-to-day basis, to socialize with classmates, and to the value, work attitude and custom in the class (Black & Stephens, 1989).

3.3. Variable Measurement

3.3.1. Adversity Quotient

AQ is the sum of a series of indicators of control, ownership, reach, and endurance dimensions. Indicators of this research mainly follow the concepts of Stoltz (1997). There are twenty indicators as below: (1) I suffer a financial setback. To what extent can I influence this situation? (2) I am overlooked for a promotion. To what extent do I feel responsible for improving this situation? (3) I am criticized for a big project that I just completed. The consequences of this situation will affect? (4) I accidentally delete a very important email. The consequences of this situation will affect? (5) The high-priority project I am working on gets canceled. The consequences of this situation will affect? (6) Someone I respect ignores my attempt to discuss an important issue. To what extent do I feel responsible for improving this situation? (7) People respond unfavorably to my latest ideas. To what extent can I influence this situation? (8) I am unable to take much needed vacation. The consequences of this situation will affect? (9) I hit every red light on my way to an important appointment. The consequences of this situation will affect? (10) After extensive searching, I cannot find an important document. The consequences of this situation will affect? (11) My workplace is understaffed. To what extent do I feel responsible for improving this situation? (12) I miss an important appointment. The consequences of this situation will affect? (13) My personal and work obligations are out of balance. To what extent can I influence this situation? (14) I never seem to have enough money. The consequences of this situation will affect? (15) I am not exercising regularly when I know I should be. To what extent can I influence this situation? (16) My team is not meeting its project goals. To what extent do I feel responsible for improving situation? (17) My computer crashed for the third time this week. To what extent can I influence this situation? (18) The meeting I am in is a total waste of time. To what extent do I feel responsible for improving this situation? (19) I lost something that is important to me. The consequences of this situation will affect? (20) The team leader adamantly disagrees with team members' decision. The consequences of

this situation will affect? Indicators such as 1, 7, 13, 15, 17 are used to measure control dimension. Indicators such as 2, 6, 11, 16, 18 are used to measure ownership. Indicators 3, 5, 9, 12, 20 are used to measure reach. Indicators such as 4, 8, 10, 14, 19 are used to measure endurance.

3.3.2. Emotional Intelligence

Indicators of this research mainly follow the concepts of Bar-on (1997) on adaptability in problem solving particularly: my approach in overcoming difficulties is to move step by step, when faced with a difficult situation, I like to collect all the information about it that I can, I like to get an overview of a problem before trying to solve it, when facing a problem, the first thing I do is stop and think, when trying to solve a problem, I look at each possibility and then decide on the best way, and in handling situations that arise, I try to think of as many approaches as I can.

3.3.3. Adaptation

Indicators of this research mainly adopt concepts of Black & Stephens (1989). Indicators of adaptation are such I am adjusted to interact with classmates on a day-to-day basis, I am adjusted to socialize with classmates, I am adjusted to the value, work attitude and custom in my class, and I am adjusted to the speaking with my classmates.

3.4. Observation population and sample frame

Research target is mainly our Management College first-year students. The reason to choose first-year students because the university environment is new to them. The purpose of this research is to understand adversity quotient and emotional intelligence in influencing students' adaptation. Sampling method is by asking students (i.e. target population) who are new to Management College to answer the questionnaire by the end of June in academic year in 2024. Returned questionnaires are 342. After deducting 6 questionnaires with several missing values in the survey data, total valid sample questionnaire return is 336 students.

3.5. Measuring Methods

Quantitative research is used to address problems by providing correlations or revealing the link between research variables (Creswell, 2012). This study applies quantitative research method. Quantitative research also assists in assessing the significance of relationships between variables. Because the research demands precise measurements, the quantitative technique is used for this investigation.

3.5.1. Questionnaire

Random sampling was designed based on a 5-point Likert Scale, with criterion 5=very high,

4=high, 3=normal, 2=low, 1=very low for measuring adversity quotient, with criterion 5=very often true of me, 4=often true of me, 3=sometimes true of me, 2=seldom true of me, 1=very seldom true of me for measuring emotional intelligence, and with criterion 5=strongly agree, 4=agree, 3= normal, 2=disagree,1=strongly disagree for measuring adaptation. Respondents answer the given questions by marking the suitable choice. The questionnaires include items to measure the different variables of the research model. The complete questionnaire includes the following: (1) adversity quotient using 20 items from Stoltz (1997); (2) emotional intelligence using 6 items from Bar-on (1997); (3) adaptation using 4 items revised from Black & Stephens (1989).

3.5.2. Data collection Method

Data gathering method of this study is by questionnaire survey, which is the participants are given a series of questions with a written statement to answer. Questionnaires were based on a Likert scale from 1 to 5. Moreover, for providing the convenience to the respondents whose mother language is not Chinese, and for improving the answering accuracy, the questionnaire was translated in English.

3.5.3. Data analysis methods:

SPSS 25 statistical analysis software was used as tool for data analysis in the analysis process. Research hypotheses can be tested by the following analyses in terms of descriptive data analysis, reliability analysis, validity test, common bias test, factor analysis, Pearson correlation analysis, and regression analysis.

1. Descriptive Statistics Analysis:

Descriptive statistical analysis is used to organize, describe, and interpret data systematically. In this study, frequency distribution and estimated percentage are used for the personal attribute variables of the sample to understand the distribution of each variable.

2. Reliability Analysis:

The most popular method for determining internal consistency or reliability is Cronbach's alpha (Cronbach, 1951). It is frequently used to determine if a scale created by a survey's numerous Likert items is stable.

3. Validity Test:

Because this research adopts questionnaire survey, it is reasonable to know construct validity. Regarding construct validity test, exploratory factor analysis (Fabrigar, et al 1999) is applied to see questionnaire overall indicators' construct validity. KMO and Bartlett's test of sphericity are applied to see the results of questionnaire construct validity.

4. Common Bias Test:

To ensure that there is no bias in the study, the common bias test is usually used to look at the

data for both independent and dependent variables that are obtained from the same measurement context with the same item context and similar item qualities. This bias is investigated using the Harman's single factor.

5. Factor Analysis:

To reduce the dimensions of dependent variables, factor analysis is applied. And other reasons to apply exploratory factor analysis (Fabrigar, et al., 1999) are that scales are a collection of questions used to measure a particular research topic, there are no a priori hypotheses about factors or patterns of measured variables (Finch & West, 1997), this study observes the student objects which are different from previous observations on working level in the professional job fields, and this study has modified the adversity constructs which are more suitable and easier for observing students' adaptation.

6. Pearson Correlation Analysis:

It is a test statistic for identifying the statistical relationship between two variables. It is regarded as the best tool for assessing the connection between variables of interest since it is based on the covariance approach. It can show the direction of the correlation and magnitude.

7. Regression Analysis:

When the research needs to measure one variable's value depending on another's value, regression analysis is used. The variable this research wishes to predict, or the result variables, is the dependent variable. This research estimates the value of additional variables, or predictor variables, using the independent variable.

4. EMPIRICAL FINDINGS

This section shows the results of empirical findings including descriptive data analysis results, results of reliability test, results of validity test, results of common bias test, results of factor analysis, results of Pearson correlation analysis, and results of regression analysis.

4.1. Descriptive Data Analysis Results

Table 4.1-Table 4.6 (see appendix) contain descriptive data analysis results of variables. Indicators of adversity quotient show the lowest mean value is 3.03 and the highest mean value is 3.92. Indicators of emotional intelligence show the lowest mean value is 3.53 and the highest mean value is 4.19. Indicators of adaptation show the lowest mean value is 3.71 and the highest mean value is 3.94. Sample contains 109 male and 227 female students. 155 students are age 19, 61 students are age 18, 50 students are age 20, and 48 students are age 21. There are 318 Taiwanese students, and 18 foreign students in the sample.

4.2. Results of Reliability Test

Table 4.7 shows (see appendix) the reliability test results of each variable. Each variable has high Cronbach Alpha. The results show all variables' Cronbach's Alpha value greater than 0.8

that constructs have internal consistency and show all with high reliability. Adversity quotient Cronbach's Alpha is 0.809, emotional intelligence Cronbach's Alpha is 0.818, adaptation Cronbach's Alpha is 0.854.

4.3. Results of Validity Test

Table 4.8 (see appendix) show that KMO value is 0.623 which indicates a good degree of common variance and shows questionnaire construct validity is good. Barlette test result yields a significance value ($p < 0.01$) less than point zero five, and shows that the variables are sufficiently interrelated and questionnaire has good construct validity.

4.4. Results of Common Bias Test

Table 4.9 (see appendix) shows the results of Common Bias Test. The result shows there is no bias. Harman's single factor is applied to see Common Method Bias Test. The results show that the Harman's first single factor is 27.879% which is lower than 40%. Therefore, this study has no bias.

4.5. Results of Factor Analysis

Results of factor analysis (see Appendix, Table 4.10) show that five factors are abstracted for adversity quotient profile. According to the characteristics of factors, this research gives the name of factors as below. ADV1 is control & ownership factors. ADV2 is unable reach factors. ADV3 is external reach factors. ADV4 is endurance factors. ADV5 is mixed factors.

4.6. Results of Pearson Correlation Analysis

Table 4.11 (see appendix) provide the results of Pearson correlation analysis among variables. The results indicate that EQ has positive relationship with adaptation. Control and ownership factors has positive relationship with adaptation. EQ has positive relationships with control & ownership factors, unable reach factors, and mixed factors.

4.7. Results of Regression Analysis

Table 4.12 – Table 4.14 (see appendix) shows the results of regression analysis on the relationship between variables. The results indicate EQ has significant influences on adaptation. Adversity quotient in terms of control and ownership factors have significant influences on adaptation. EQ has significant relationships with adversity quotient in terms of control and ownership factors, unable reach factors, external reach factors, and mixed factors. The results of Durbin-Watson statistics have all values close to 2 that show there is no autocorrelation detected in the sample, and all variables have independence.

4.8. Results of Hypotheses Testing

From the above multivariate analysis test results, the research hypotheses H1 and H2 listed below have found partial empirical supports, and H3 has found empirical supports.

H1: Adversity quotient has significant relationship with emotional intelligence.

H2: Adversity quotient has significant influence on adaptation.

H3: Emotional intelligence has significant influence on adaptation.

5. CONCLUSION

This research focused on exploring students' characteristics in terms of adversity quotient (AQ) and emotional intelligence (EQ) influencing their adaptation. The opportunity to participate university to increase students' academic knowledge and upgrade their capabilities is a good way for improving AQ and EQ. Learning something with their peers in a day-to-day interaction and for completing team task and assignment together that they need to adjustment themselves to the class custom and to get along with classmates.

This empirical research discovers that EQ has significant influences on adaptation. Adversity quotient in terms of control and ownership factors have significant influences on adaptation. EQ has significant relationships with adversity quotient in terms of control and ownership factors, unable reach factors, external reach factors, and mixed factors. Three sets of variables in terms of emotional intelligence, adversity quotient, and adaptation have their valid representativeness in the research framework.

This empirical research has found the followings. Adversity quotient in control and ownership is high, adaptation is high. When emotional intelligence is high, adaptation is high. EQ has positive relationship with adversity quotient. This research confirms that students have control influences on the direction of their action, level of effort, and perseverance. Students with strong control aspect tends to be proactive in adversity situations and can turn adversity into opportunity (Stoltz, 1997). They will exert more effort with higher levels of resilience and perseverance in attaining assigned tasks successfully (Hung & Chin, 2013). With higher control, better adaptation. Ownership involves the degree of accountability students feel to improve the outcome of adversity situations (Stoltz, 1997). Reach including unable factors and external factors is about students perceive the influences of adversity into other areas of life (Stoltz, 1997).

The empirical evidence supports that Black & Stephens' (1989) adaptation measurements are applicable including interaction related factors. Emotional intelligence in terms of adaptability (in terms of problem-solving) from the Bar-on model (2004, 2006a, 2006b, 2007) can influence students' adaptation. The empirical evidence shows that adversity quotient including control and ownership factors (Stoltz (1997, 2000, 2015) can influence students' adaptation. Students with high EQ, their adversity quotient in terms of control and ownership factors, unable reach

factors, external reach factors, and mixed factors are also high. Therefore, it can be asserted that there is a positive relationship between EQ and AQ. The empirical evidence supports that students' adaptation is strongly linked with adversity quotient and emotional intelligence (Engelberg & Sjoberg, 2004; and Parker et al., 2004b). EQ and CQ have a positive and significant relationship (Cando & Villacastin, 2014).

With good adversity quotient and emotional intelligence, students can easily overcome difficulties occurring in their daily life. Through good interaction with their classmates, they can learn from each other and increase their knowledge and capabilities, doing assignment together provides them opportunities to know each other. Apparently, students with high AQ and emotional intelligence can achieve great success for themselves.

This empirical research supports the viewpoint that with good adversity quotient and emotional intelligence can lead the students to solve out problem easily and do better decision making, and they would have better adaptation in their academic life. Consequently, this research has successfully in discovering the significant relationships among adversity quotient, emotional intelligence and adaptation. Students who have better adaptation will result in a better learning outcome. Teachers may build more comprehensive learning techniques and assist students in achieving academic achievement by utilizing various learning approaches.

Emotional intelligence (EQ) is the capacity to recognize, use, comprehend, manage, and handle emotions. Emotional intelligence can influence the students' learning condition. Emotional intelligence assists people in developing stronger connections, succeeding in school and at work, and achieving their professional and personal objectives. It can assist people in connecting with their feelings, translating purpose into action, and making educated judgments about what is most important to them. Therefore, emotional intelligence is still a powerful variable in explaining the process of adaptation and learning.

This research suggests that university can improve students' adversity quotient and emotional intelligence. With higher level of adversity quotient and emotional intelligence students might feel at ease, coherent, and in control over own emotions as well as those of others. This gives them a sense of calm and psychological comfort, which will enhance their mental health and motivate them to do better in school. By offering guidance and providing instruction through courses, activities, or other means, educational institutions can encourage students to express their actual emotions and increase their adversity quotient profile and emotional intelligence. Good adaptation can help students become more competent, literate, and knowledgeable.

Many dimensions can affect students' adaptation. Using intelligence quotients can help people

build a dynamic team if they simply look at all the quotients (such as emotional quotient, adversity quotient, social quotient, and cognitive quotient) simultaneously vs. intelligence quotient independently. One limitation of this research is that the number of respondents in the sample was limited to 336 students. Other researchers can examine a larger sample or conduct research on other university's students. Also, there are different challenges that Taiwanese students and international students face according to their original growing background. For example, the language issues during the class, learning method, the motivations of their learning. Therefore, future research can add more variables such as motivations of students, institution's role and supports, to observe their influences on students. Also, future research can gather more samples of the international students from different universities and countries to see the differences of students' emotional intelligence and adversity quotient, and adaptation process among different nationalities.

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7. APPENDIX

Table 4.1. Descriptive Data Analysis Results of Adversity Quotient Profile

	Mean	SD	N
1 suffer a financial setback	3.27	.952	329
2 overlooked & feel responsible	3.43	.864	329
3 being criticized for project	3.43	1.066	329
4 accidentally delete email been affected	3.57	1.151	329
5 project been canceled	3.80	.989	329
6 project been canceled	3.60	.916	329
7 people respond unfavorable to my idea	3.03	.925	329
8 unable to take vacation	3.33	1.000	329
9 hit red light on the way to appointment	3.61	1.025	329
10 after searching cannot find document	3.57	.983	329
11 feel responsible for understaffed	3.55	.916	329

12 miss important appointment	3.29	1.005	329
13 work obligations out of balance	3.16	.863	329
14 no enough money	3.24	1.044	329
15 not exercising regularly	3.41	.896	329
16 not meeting project goals	3.53	.897	329
17 computer crashed	3.03	1.154	329
18 meeting waste of time	3.46	1.000	329
19 lost something important	3.92	.991	329
20 leader disagree members' decision	3.39	.880	329

Table 4.2. Descriptive Data Analysis Results of Emotional Intelligence

	Mean	SD	N
1 overcoming difficulties step by step	3.53	1.002	335
2 collect information in difficult situation	3.96	.805	335
3 overview a problem before solving	4.19	.786	335
4 stop & think when facing problem	4.03	.820	335
5 look possibility to solve problem	4.00	.865	335
6 think of many approach	4.10	.798	335

Table 4.3. Descriptive Data Analysis Results of Adaptation

	N	Mean	SD
1 interact with classmates	336	3.94	.914
2 socialize with classmates	336	3.84	.937
3 value, work attitude and custom in class	336	3.71	.895
4 speaking with classmates	336	3.94	.904

Table 4.4. Sample Distribution Based on Sex

	frequency	%	Valid %	Accumulative %
male	109	32.4	32.4	32.4
female	227	67.6	67.6	100.0
Total	336	100.0	100.0	

Table 4.5. Sample Distribution Based on Age

Age	frequency	%	Valid %	Accumulative %
18	61	18.2	18.3	18.3
19	155	46.1	46.4	64.7
20	50	14.9	15.0	79.6
21	48	14.3	14.4	94.0
22	5	1.5	1.5	95.5
23	8	2.4	2.4	97.9
24	2	.6	.6	98.5
26	1	.3	.3	98.8
29	2	.6	.6	99.4
31	1	.3	.3	99.7
32	1	.3	.3	100.0
Total	334	99.4	100.0	
missing value	2	.6		
Total	336	100.0		

Table 4.6. Sample Distribution Based on Nationality

	Frequency	Percent	Valid Percent	Cumulate Percent
Valid Taiwan	318	94.6	94.6	94.6
Indonesia	5	1.5	1.5	96.1
Hong Kong	1	.3	.3	96.4
Malaysia	3	.9	.9	97.3
Vietnam	2	.6	.6	97.9
Jordon	1	.3	.3	98.2
Yemen	1	.3	.3	98.5
Hibrid of Taiwan & Vietnam	1	.3	.3	98.8
Thailand	4	1.2	1.2	100.0
Total	336	100.0	100.0	

Table 4.7. Reliability Test Results

Variables	Cronbach Alpha
Adversity Quotient Profile	.809
Emotional Intelligence	.818
Adaptation	.854

Table 4.8. Results of Validity Test

KMO & Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.623
Bartlett's Test of Approx. Chi-Square	227.445
Sphericity df	21
Sig.	.000

Table 4.9. Results of Common Bias Test - Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	1.952	27.879	27.879	1.952	27.879
2	1.075	15.352	43.231	1.075	15.352	43.231
3	1.004	14.345	57.576	1.004	14.345	57.576
4	1.002	14.316	71.892	1.002	14.316	71.892
5	.996	14.234	86.125			
6	.500	7.140	93.266			
7	.471	6.734	100.000			

Extraction Method: Principal Component Analysis

Table 4.10. Results of Factor Analysis

	Factor Loadings				
	1	2	3	4	5
16 not meeting project goals	.722	.082	.031	.011	.148
11 feel responsible for understaffed	.721	.047	.117	.115	.097
2 overlooked & feel responsible	.673	.006	.066	.257	-.026
18 meeting waste of time	.668	.082	.125	-.117	.150
1 suffer a financial setback	.560	-.059	-.079	.355	-.269
13 work obligations out of balance	.531	.152	-.055	.107	.267
15 not exercising regularly	.528	.284	-.011	-.012	.095
6 project been canceled	.506	.186	.388	-.138	.074
9 hit red light on the way to appointment	.037	.737	.080	.284	-.057
8 unable to take vacation	.162	.729	.021	.103	.087

20 leader disagree members' decision	.221	.526	.237	-.041	.192
5 project been canceled	.099	.125	.759	.139	-.089
3 being criticized for project	-.113	-.033	.644	.192	.250
7 people respond unfavorable to my idea	.187	.317	.559	-.195	.035
10 after searching cannot find document	.066	.422	.018	.631	.053
19 lost something important	.080	.232	.093	.580	.203
4 accidentally delete email been affected	.119	-.132	.506	.538	.007
17 computer crashed	.270	-.036	.041	-.054	.709
14 no enough money	.012	.325	.042	.105	.618
12 miss important appointment	.189	-.028	.092	.374	.544
eigenvalue	4.554	1.914	1.403	1.253	1.206
Cronbach's alpha	0.773	0.607	0.535	0.508	0.503
% of Variance	22.770	9.568	7.015	6.265	6.029
Cumulative %	22.770	32.339	39.354	45.619	51.649

Note: Extraction Method : Main Principal Component Analysis.

Rotation Method : Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Name of Factors: ADV1: Control & Ownership Factors, ADV2: Unable Reach Factors, ADV3:

External Reach Factors, ADV4: Endurance Factors, ADV5: Mixed Factors

Table 4.11. Results of Pearson Correlation Analysis between Variables

		Adaptation	EQ1	ADV1	ADV2	ADV3	ADV4
Adaptation	Pearson Correlation	1	.454**	.497**	-.039	-.008	-.037
	Significance (two tails)		.000	.000	.481	.881	.503
	N	336	335	329	329	329	329
EQ1	Pearson Correlation	.454**	1	.469**	.149**	.106	.003
	Significance (two tails)	.000		.000	.007	.056	.950
	N	335	335	328	328	328	328
ADV1	Pearson Correlation	.497**	.469**	1	.000	.000	.000
	Significance (two tails)	.000	.000		1.000	1.000	1.000
	N	329	328	329	329	329	329
ADV2	Pearson Correlation	-.039	.149**	.000	1	.000	.000
	Significance (two tails)	.481	.007	1.000		1.000	1.000
	N	329	328	329	329	329	329
ADV3	Pearson Correlation	-.008	.106	.000	.000	1	.000
	Significance (two tails)	.881	.056	1.000	1.000		1.000
	N	329	328	329	329	329	329
ADV4	Pearson Correlation	-.037	.003	.000	.000	.000	1
	Significance (two tails)	.503	.950	1.000	1.000	1.000	
	N	329	328	329	329	329	329
ADV5	Pearson Correlation	-.058	.110*	.000	.000	.000	.000
	Significance (two tails)	.295	.047	1.000	1.000	1.000	1.000
	N	329	328	329	329	329	329

** Significance at 0.01 level (two tails) .

* Significance at 0.05 level (two tails) .

Table 4.12. Results of Regression Analysis between Adversity Quotient and Adaptation

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.504 ^a	.254	.242	.87159656	1.952

a. Predictors : (Constant) , ADV5, ADV4, ADV3, ADV2, ADV1

b. Dependent Variable: Adaptation

ANOVA^a

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	83.378	5	16.676	21.951	.000 ^b
	Residual	245.377	323	.760		
	Total	328.755	328			

a. Dependent Variable: Adaptation

b. Predictors : (Constant) , ADV5, ADV4, ADV3, ADV2, ADV1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	β		
1	(Constant)	-.012	.048		-.251	.802
	ADV1	.498	.048	.497	10.345	.000
	ADV2	-.039	.048	-.039	-.811	.418
	ADV3	-.008	.048	-.008	-.172	.863
	ADV4	-.037	.048	-.037	-.770	.442
	ADV5	-.058	.048	-.058	-1.204	.229

a. Dependent Variable: Adaptation

Table 4.13. Results of Regression Analysis between Emotional Intelligence and Adaptation

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.454 ^a	.206	.204	.89262725	1.916

a. Predictor : (Constant) , EQ1

b. Dependent Variable: Adaptation

ANOVA^a

Model	Sum of Square	df	Mean Square	F	Sig.
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1	Regression	68.966	1	68.966	86.556	.000 ^b
	Residual	265.329	333	.797		
	Total	334.295	334			

a. Dependent Variable: Adaptation

b. Predictor : (Constant) , EQ1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	β		
1	(Constant)	-.003	.049		-.051	.959
	EQ1	.454	.049	.454	9.304	.000

a. Dependent Variable: Adaptation

Table 4.14. Results of Regression Analysis between Adversity Quotient and Emotional Intelligence

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.515 ^a	.266	.254	.86658186	1.750

a. Predictors : (Constant) , ADV5, ADV2, ADV3, ADV1, ADV4

b. Dependent Variable: EQ1

ANOVA^a

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	87.461	5	17.492	23.293	.000 ^b
	Residual	241.810	322	.751		
	Total	329.271	327			

a. Dependent Variable: EQ1

b. Predictors : (Constant) , ADV5, ADV2, ADV3, ADV1, ADV4

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	β		
1 (Constant)	-.001	.048		-.017	.986
ADV1	.471	.048	.469	9.825	.000
ADV2	.149	.048	.149	3.124	.002
ADV3	.108	.048	.107	2.245	.025
ADV4	.007	.048	.007	.149	.882
ADV5	.112	.048	.111	2.328	.021

a. Dependent Variable: EQ1



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MS0053: Transnational Entrepreneurship Survivability: A Configurational Approach

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Transnational entrepreneurship survivability: A configurational approach

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Extended Abstract

This study examines the role of entrepreneurs' multi-country resources and mobility in achieving transnational entrepreneurship survivability. This research is outlined by the concepts of social networks and human capital in entrepreneurial opportunity development. Specifically we explore the way transnational ventures achieve long term survivability in a host country through the background of Korean transnational ventures (KTVs) in a host country, Malaysia. To do so we utilize an abductive qualitative design using a configurational approach. Our findings indicate that there are four core configurations associated with long term entrepreneurial survivability and geographical mobility is present as the necessary condition in achieving the outcome of interest. Theory-wise, our study speaks to the discourse on entrepreneurial survivability especially on minority-owned ventures. Practise-wise, the configurations are useful for transnational entrepreneurs and policy makers interested in developing policies encouraging transnational venture sustainability.

Keywords: Transnational entrepreneurs, configurational approach, entrepreneurial survival

1. Introduction

To address the gap within the discussion of transnational migrant-owned ventures, we: (1) examine the strategies adopted by TEs in ensuring their ventures' survivability and (2) investigate what are the configurations of multiple-country networks, knowledge and geographical mobility that contributes towards entrepreneurial survivability. Doing so will enrich our knowledge on entrepreneurial survivability, especially for transnational migrant-owned ventures. Practice-wise, the findings of this research is particularly useful for TEs operating ventures in multiple countries and the policy makers involved in developing such ventures.

As a background to address our research topic, we focus on KTVs in Malaysia. Through

an abductive qualitative design using a configurational approach, we present our findings as multiple cases representing KTVs operating in multiple countries. The findings indicate that there are four main configurations associated with entrepreneurial survivability, with geographical mobility as the main condition associated with the outcome of interest. The findings are then articulated into a model of venture survivability for transnational migrant-owned ventures.

2. Concepts Outlining this Study

2.1. Transnational Entrepreneurs

Transnational entrepreneurs (TEs) are defined as foreign-born entrepreneurs who travel back and forth between their home and host countries [1-3]. TEs are embedded in multiple countries and intercultural contexts, and engage in entrepreneurship activities between their home and host countries. One of the enduring characteristics of TEs lies in their capabilities in mobilizing both social networks and unique cognitive resources across multiple institutional environments [1].

2.2. Transnational Entrepreneurs' Resources

TEs combine capital in host and home environments to create unique combinations of capital from both [2]; through pursuing a modern middleman role that transcends the multiple institutional environments in which they are embedded [3, 4]. TEs' multi-country backgrounds enable the formation of teams and ventures across multiple countries which encourages business growth by accumulating resources from multiple sources. TEs' transnational social capital [5], which include links with co-national communities in the host country and industry-based communities in their home countries enable knowledge transfer and increase of legitimacy of their ventures in their home and host countries.

The human capital approach in international entrepreneurship posits that TEs' dual or in some case, multiple-country knowledge is instrumental in recognizing and exploiting international entrepreneurial opportunities [6, 7] and assists in reducing TEs' liability of foreignness [8]. Through such knowledge and skills, TEs are able to introduce process or products unavailable in the host country but available in their host countries or vice versa [6].

One of the values of international mobility for TEs is the development of personal capabilities from overseas experiences to mobilize resources. As transnational migration within the entrepreneurship perspective occurs in countries with varying developmental and cultural contexts, it is possible for TEs to coordinate home-host country resources for their

transnational ventures. TEs' home country labour market and consumer market characteristics encourage such mobilisation, in which countries with relatively economical labour market is utilised for manufacturing purposes, while more developed host countries are adopted as TEs' strategic offices.

3. Methods

To address the research question, we focus on the context of Korean entrepreneurs in Malaysia using through a case-based methodology, namely qualitative comparative analysis (QCA). Such unique context warrants a further examination as they represent (1) entrepreneurial individuals from a minority group in the host country and (2) entrepreneurs from a relatively more developed country than the host country. As such context is unique, we focus primarily on entrepreneurs from one home country to eliminate the need to examine moderating factors from entrepreneurs' home nations. To this aspect 10 cases of entrepreneurs were selected to examine the conditions. 10 cases are considered adequate for this study as QCA is context-dependent, in which they depend on the conditions and contexts to be examined [9]. Here, we hypothesize that long term transnational entrepreneurship (LTE) is a result of entrepreneurs' multiple country networks (MUNET), multiple country experience (MUNEX) and geographical mobility (GEOM). Table 1 describes the details of our participants and their ventures. All of the participants' names were coded for confidentiality and consistency reasons. The interview narratives were then transcribed and analysed using a qualitative analysis software, QSR NVivo.

Insert Table 1 here

4. Results

In coherence with the convention of similar studies employing QCA, the presence of a condition is represented with a solid black dot (●) and the absence of a condition with a hollow circle with an x through it (⊗). Blanks symbolize a “do not care” state for a particular condition within a configuration meaning that the condition may be either present or absent. The theoretically-driven assumption guiding our study is the presence of transnational networks, transnational experience and geographical mobility are each associated with long term entrepreneurial survival in a host country. Based on these solutions, core conditions are those that appear in both parsimonious and intermediate solutions, while peripherals are those that can only be removed when theoretically-driven assumptions about remainders are relaxed [10, 11]. The findings indicate that no conditions (networks, experience) on their own were

necessary for long-term survivability, except for geographical mobility. We present the configurations associated with long term entrepreneurial survivability for KTEs. There are four out of eight configurations or paths that are associated with the outcome of this study, which are (1) MUNET*MUEX*GEOM, (2) ~MUNET*~MUEX*GEOM, (3) ~MUNET*MUEX*GEOM and (4) ~MUNET*~MUEX*~GEOM. The summary of the results is shown in Table 2.

Insert Table 2 here

5. Discussion

This research focuses on transnational entrepreneurial survivability, in response to the gap in the literature on venture survivability for firms owned and operated by transnational migrants. To examine our research focus, we ask “What are the combinations of transnational network, experience and mobility in enabling venture survival?” Our interviews with the top management of Korean transnational ventures that have been operating in the host country for more than 10 years indicate that there are four core configurations of networks, experience and mobility that enables venture survivability, with geographical mobility present in all four configurations.

Ventures created by migrants have been shown to have a lower rate of survival in comparison to their local competitors; liability of foreignness is deemed to be one of the main explanatory factors [12]. Their positions as non-local firms [13] exposes such ventures for country risk thus making them more vulnerable to the environmental uncertainties in the host country. In this aspect it is worthwhile to investigate how do transnational ventures achieve long-term survivability in the host country. Our findings indicate that there are several combinations of TEs’ networks, experience and mobility in enabling venture survivability. A further observation on the contextual backgrounds of the configurations revealed that the ventures’ main operation and the way they utilize the host country (as a managing center for their transnational operations or as a target market) influences the configurations for long-term venture survivability. In essence, this study’s findings indicate that TEs mobilize their resources through their ability to balance differences between countries; and this is mainly facilitated by their geographical mobility.

6. Conclusion

To address the research focus, we pay attention to the way transnational ventures achieve long term survivability in a host country, through the context of KTVs in Malaysia. We examine

the research subject through an abductive qualitative design using a configurational approach, which enabled a theory-and-data-driven findings. Based on our findings, we present a model of transnational venture survivability in a host country as a result of our abductive research design. Theory-wise, this contributes to the discourse of entrepreneurial survival for minority-owned firms, through emphasizing that the importance of the decision makers' network and experiences for venture survival, which are shaped by their ability to be geographically mobile.

7. Tables

Table 1 Data Sources

Company	Year established	Number of employees	Main operation
A	1990	2 to 4	Business-to-business (B2B) manufacturing and sourcing of stones and construction
B	2000	5 to 10	B2B manufacturing of construction chemicals
C	2001	5 to 10	B2B and business-to-consumer (B2C) manufacturing of animal feed
D	1995	5 to 10	B2B sourcing of automotive parts
E	1997	5 to 10	B2B machine design consultation and manufacturing
F	1994	101-200	B2B and B2C sourcing of food and beauty products
G	2006	5 to 10	B2B consultation services
H	2007	11-20	B2C sourcing of food and beauty products
I	1995	21-100	B2B sourcing of construction products
J	2010	21-100	B2B and B2C sourcing of food and beauty products

Table 2 Summary of Findings

Configurations	1	2	3	4
	MUNET*MUEX* GEOM <i>Cultivate networks and utilize experience during travel</i>	~MUNET*~MUEX *GEOM <i>Specific niche, focus on quality</i>	~MUNET*MUEX* GEOM <i>Transnational mobility for sourcing advantages</i>	MUNET*~MUEX* GEOM <i>Networks compensate lack of transnational experience</i>
MUNET	●		⊗	●
MUEX	●		●	⊗
GEOM	●	●	●	●
Unique coverage	0.653061	0.357823	0.450340	0.408163
Consistency	0.965795	1	0.880319	1
Cases	D, E, F, H	A	G, I, J	B, C

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MS0054: Is DEI Just Lip Service Running on Reserve Mode?

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Title: "Is DEI Just Lip Service Running on Reserve Mode?"

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Abstract

In today's competitive landscape, Diversity, Equity, and Inclusion (DEI) initiatives are pivotal for fostering innovative, inclusive, and high-performing workplaces. This paper investigates the significant challenges that DEI managers encounter as change agents, with a particular focus on resistance to change. Through semi-structured interviews with DEI managers, our preliminary findings reveal that resistance to change is a major impediment to the effective implementation of DEI strategies. This resistance stems from various sources, including insufficient leadership support, deeply ingrained biases, and competing organizational priorities. Managers report that without executive buy-in and a clear commitment to DEI, efforts often result in superficial rather than meaningful changes.

To validate the qualitative findings, the next stage of this study involves a two-wave survey designed to measure employee perceptions of factors influencing DEI performance within their organizations. This study aims to develop a scale for assessing identified resistance factors and to conduct a broader survey to quantify their impact and gather comprehensive employee feedback. Our research aims to contribute not only to theoretical advancements by providing empirical evidence on how resistance manifests in DEI contexts but also underscores the critical need for fostering an inclusive culture and securing leadership support to overcome these barriers. By addressing these challenges, organizations can move beyond tokenism and achieve substantive, sustainable progress in their DEI initiatives.

Keywords: DEI, Change Agents, Leadership Buy-in, Resistance to Change

1. Introduction

In today's increasingly diverse and interconnected world, Diversity, Equity, and Inclusion (DEI) have become central themes in modern organizational practices. Embracing DEI is not only a moral imperative but also a strategic advantage, as diverse teams drive innovation and creativity (Griffen, 2020; Ivancevich & Gilbert, 2000). DEI managers often find themselves as change agents, squeezed by the dual pressures of maintaining external legitimacy and building internal readiness for change (Kundu & Mor, 2017). Externally, they face the challenge of maintaining authenticity and legitimacy, while internally, they face the challenge of building genuine support and readiness for change. Through semi-structured interviews with DEI managers and an online survey with employees, this paper aims to study the challenges in advancing the DEI agenda within organizations. Additionally, it seeks to identify which factors are most influential in shaping the perception of an organization's employer branding in embracing DEI.

2. Literature Review

Management scholars emphasize the significance of DEI for contemporary business practices. Social movements have heightened awareness of inequality, making DEI a fundamental aspect of organizational strategy (Arsel et al., 2022). Management scholars have argued that Integrating DEI into core operations is essential for creating inclusive cultures where diverse groups can thrive (Ferraro et al., 2023; Lee et al., 2024; Rynarzewska, 2024). Recent studies indicate that DEI offers tangible business benefits, such as enhancing brand resonance, improving organizational performance, and fostering innovation and talent attraction (Groenewald, 2024; McKinsey, 2020; Sudha & Pradeep, 2024;). However, implementing DEI initiatives faces challenges, including the potential for perceived inauthenticity or superficiality (Kanitz et al., 2024). Consumers and employees may view DEI efforts as mere lip service if not genuinely embedded in the organization's culture and practices (Alt et al., 2024; Ferraro et al., 2023).

In marketing, scholars recognize the growing importance of DEI in reflecting diverse consumer bases and addressing historical inequities. Arsel et al. (2022) emphasized the need for a systematic approach to integrating DEI into marketing practices, ensuring diverse consumer groups are adequately represented and engaged. Dimitrieska et al. (2019) discussed the institutionalization of DEI in marketing strategies, highlighting the need to embed DEI principles into the core of practices. Henderson and Williams (2013) stressed the importance of inclusive marketing that empowers traditionally marginalized groups, fostering a sense of belonging. Many brands aim to portray diversity, but a lack of depth and understanding can lead to marketing efforts that appear inclusive on the surface but fail to resonate authentically.

2.1 Research Question Development: The purpose of this paper is to explore the factors that influence employees' perceptions of their organization's commitment to diversity, equity, and inclusion (DEI). This investigation is motivated by ongoing debates and research gaps in the DEI domain. A key concern is the risk of DEI initiatives being perceived as inauthentic or superficial, rather than demonstrating genuine commitment. Additionally, there is a delicate balance between fostering inclusivity and the potential for tokenism or stereotyping. Discontented opponents may feel threatened by the perceived prospect of losing out to other groups through “positive discrimination”, or being branded as a “DEI hire” who is recruited mainly for the purpose of making up the quota, rather than on their own merits (Ficht & Levashina, 2023). Further, organizations often grapple with the tension between achieving financial sustainability and meaningfully extending services to underserved populations.

2.2 Theoretical Framework: As the change readiness for different organizations differs, one of the primary job purposes of DEI managers is to drive the necessary changes internally. Hence, this paper follows the guidance of the organizational change framework proposed by Jacobs et al., (2013). Specifically, this paper examines the internal and external driving forces. Externally, organizational legitimacy theory, which posits that an organization's actions must align with societal norms and stakeholder expectations to be deemed appropriate and acceptable (Díez-Martín et al., 2021), highlights the external pressures DEI managers face. Internally, organization change readiness theory, defined by Weiner (2020) as the collective commitment and efficacy of an organization to implement change, emphasizes the need to foster a supportive culture that is prepared for DEI initiatives.

Many of the challenges that DEI managers face are rooted in the well-documented concept of resistance to change. Kinicki and Williams (2020) highlighted the pervasive impact of uncertainty, noting that managers must prepare for "the future that has already happened." This uncertainty disrupts established routines and fosters fear of the unknown among employees, as Awoke (2020) pointed out, emphasizing that restructuring organizational structures can lead to apprehension and resistance. The extant literature also includes scholarly discussions about other resistance-to-change reasons such as threat to job security (Srivastava & Agrawal, 2020), insufficient communication (Khan et al. 2017), and deep-rooted ("entrenched") organizational culture (Lauer, 2021).

3. Methodology

3.1 Study 1: Exploratory Research Through Semi-Structured Interviews

Given the nascent nature of research on DEI practices in organizations, the first study adopts an exploratory approach to identify key challenges in DEI implementation. This study involves conducting semi-structured interviews with DEI managers to gain an in-depth understanding of the challenges they encounter (Adeoye-Olatunde & Olenik, 2021). The primary objective of this exploratory study is to identify the external and internal factors that hinder the effective promulgation of DEI initiatives. Specifically, the interviews aim to uncover the reasons behind the stagnation of DEI efforts, despite the increasing societal demand for inclusivity and diversity. This is particularly pertinent in light of recent trends where major companies, such as Microsoft, have laid off their entire DEI teams, raising questions about the underlying challenges (Potter, 2024).

A purposive sampling strategy (Campbell et al., 2020) will be employed to select DEI managers who have experience in implementing DEI strategies within their organizations. The sample will include managers from various sectors, ensuring a comprehensive understanding of the issues across different organizational contexts. Thematic analysis will be used to identify recurring themes and patterns in the data, providing a rich, contextualized understanding of the factors impeding DEI progress (Clarke & Braun, 2022).

3.2 Study 2: Quantitative Testing of Identified Factors

Building on the insights gained from the first study, the second study aims to quantitatively test the relevance and impact of the identified factors on the pace of DEI agenda implementation. A survey will be developed based on the key factors identified in the exploratory study, and this survey will be distributed to a larger, more diverse sample of employees who work for organizations with a DEI commitment.

4. Preliminary Findings

4.1 Study 1 – Interviews with DEI managers

Prior to conducting a full range of semi-structured interviews, 5 exploratory interviews with DEI managers were conducted via referrals from the Hong Kong Institute of Human Resources Management (HKIHRM), which is the leading professional HR institution with over 5,000 members. Below please find a summary of the preliminary findings.

P1 – DEI Lead of a major airlines with over 75 years of history

The interviewee is not keen to see prescriptive top-down authority on achieving DEI metrics. A better approach is to cultivate an all-embracing willingness to change corporate culture with a focus on the veterans.

“Balancing the stakeholders’ expectation for authentic DEI with internal resistance. The fear is that, despite our efforts, we might only achieve a veneer of diversity without real change. A board-level top-down policy can be effective, but I don’t know if it will become a box-ticking exercise in the future.”

P2 – DEI Chairman of a global cosmetic brand who is also a senior HR leader

This role chairs the employee resource group, charged with the remit to advance the DEI agenda within the organization. Her view is that the DEI agenda has the potential to be fueling the growth of the organization, but it needs buy-in from the rest of the firm.

“The DEI agenda shouldn't be siloed to just the employee resource group. With potentially tangible outcomes such as a broader customer base and enhanced corporate branding, it needs to be embedded across all our operating units, with clear KPIs that tie directly to our overall business objectives.”

P3 – HR Director of a financial institution

She is also the DEI champion of the organization who has a remit to promote and communicate the corporate value of financial inclusion to the rest of the organization. Her view is that implementing DEI is best via the institutionalization into the organization’s Vision, Mission and Values (VMV).

“Every division head has to answer to the CEO on how their products, processes, and promotional activities can advance the financial inclusion agenda. Leadership support plays an important role.”

P4 – General Manager of a fast-food restaurant chain

She started as an executive trainee of a conglomerate with a diverse portfolio of businesses across the region. She quoted the challenges of how her chain navigated the process of expanding the customer base to include the Muslim community.

“We, including colleagues, bosses, and suppliers, were unsure of how to proceed. To many of us, expanding to Halal food was just another new business. It was a challenge to convince them to take time and resources away from existing business projects and redirect their attention into understanding the needs of the Muslim community.”

P5 – Talent Management & DEI leader of a global consulting firm

Her DEI title was added to her talent role just a few months ago. As the talent manager, she recognized the lack of representation in the workforce, which may have limited the scope of the firm’s capacity to serve clients with diverse backgrounds.

“With the ASEAN and Middle East being the new market, we are now struggling to attract and retain candidates from ethnic minority backgrounds, and this is why I have this added DEI responsibility to create a multiculturally embracing workplace.”

Key themes identified from interviews

Below are the common themes identified from the analysis of the preliminary interviews. More interviews with DEI managers from a broad range of industries will be conducted to enhance the representativeness of the data.

- 1. Resistance to change:** Organizational change, especially around sensitive issues like DEI, often faces resistance from those who are comfortable with the status quo and are threatened by the prospect of loss.
- 2. Lack of leadership support:** Without buy-in and commitment from the executive team, DEI managers are likely to struggle to gain traction and resources.
- 3. Deeply ingrained biases and discrimination:** Discriminatory attitudes, behaviors, and systems are often deeply embedded within organizational cultures.
- 4. Competing priorities:** Organizations often have many pressing priorities beyond DEI, such as immediate profitability, productivity, and operational efficiency.
- 5. Lack of accountability:** Without clear and formalized metrics, goals, and accountability structures, DEI initiatives can lack teeth and become more symbolic than substantive. DEI managers are struggling to come up with measure progress and tie it to organizational outcomes.
- 6. Insufficient resources:** Advancing DEI requires dedicated time, budget, and personnel. DEI managers frequently face resource constraints that hinder their ability to drive meaningful change

4.2 Study 2 – Surveys to Employees

Given the pivotal role that DEI managers play as change agents within their organizations, it is essential to further investigate the factors related to resistance to change, which significantly impact the effectiveness of DEI initiatives. The following proposals outline a scale development and validation and a two-wave survey study aimed at validating the DEI hindering factors scales developed from the qualitative study and understanding the impact of these factors from the employees' perspective.

Scale Development and Validation: This study will involve scale development and validation to develop items that measure the hindering factors identified through interviews. The psychometric properties of the scale, including its reliability and factor structure, will also be evaluated. The validated scale items will be used to conduct the survey in the next step of the study

Two-Wave Time-Lagged Survey: The study will employ a targeted sampling strategy, focusing on employees from organizations that have signed the HKSAR Equal Opportunities Commission's DEI Charter versus those that have not. Additionally, comparisons will be made between the perceptions of employees in Human Resources (HR), Marketing and those from other departments to explore any differences in perceptions and experiences related to DEI initiatives. The first wave of the survey will identify significant barriers to advancing DEI, while the second wave, conducted six weeks later, will gather feedback on respondents' personal concerns about the implementation of DEI within their own organizations.

5. Potential Theoretical Contributions

This study offers substantial theoretical contributions to both resistance to change theory and organizational legitimacy theory. By systematically investigating the barriers DEI managers face, the research extends the resistance to change literature. It provides a nuanced understanding of

how entrenched biases, insufficient leadership support, and resource constraints specifically undermine DEI initiatives. These insights refine existing models of resistance to change by incorporating the unique challenges associated with implementing DEI, thereby enriching the theoretical framework with context-specific variables. Moreover, the study expands organizational legitimacy theory by exploring the dual pressures that DEI managers navigate to maintain authenticity and legitimacy. The findings will highlight how DEI efforts are scrutinized both by employees, thus bridging a critical gap in the literature. Specifically, the 2-wave survey data can bring a higher level of confidence over the respondents' perceptions of the impact of DEI adoption on their respective organization's performance.

Potential Practical Contributions By studying data across different organizational contexts and roles, the study aims to identify the most influential factors that hinder DEI progress within organizations. It will provide actionable insights for DEI managers to address these barriers effectively, enhancing the theoretical understanding of resistance to change in the context of DEI initiatives. From a managerial perspective, the findings of this study can shed some light on how overcoming barriers and achieving DEI performance can contribute to achieving corporate objectives such as enhancing the employer's attractiveness in competing in the war for talent.

- End -

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MS0055: Addiction and Compulsive Buying in Short-form Video Application: The Case of Vietnam

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Addiction and Compulsive Buying in Short-form Video Application: The case of VietNam

Extended Abstract

The study set out to discover how short-form video features influence addiction and compulsive buying within the context of Opponent Process Theory. The research utilized a quantitative method using a sample of 401 participants, employing an online survey with convenience and snowball sampling methods to collect data. It is found that app features positively influence engagement and FoMO, and FoMO has a positive influence on engagement. Respectively, engagement and FoMO display a strong positive relationship with addiction behavior and addiction ultimately results in compulsive buying behavior. The findings offer theoretical contributions to and practical insights for businesses, policymakers, and users.

Keyword: short-form video, addiction, compulsive buying, engagement, fear of missing out

1. Introduction

Within the field of studies focusing on the impact of social media on consumer behavior, short-form video has gained increasing interest among academics (Liu, Ni & Niu, 2021; Tian, Bi & Chen, 2023; Yin, Li, Si & Wu, 2024; Zhang, Wu & Liu, 2019). While these emerging studies have provided valuable insights into the mechanisms through which short-form video influences consumer psychological states and behaviors, knowledge about the effects of short-form video features has been largely overlooked. To the best of our knowledge, only one study has attempted to explore how short-form video system features impact consumer psychological state (Tian et al., 2023). Without understanding the effects of each element of short-form video, we cannot fully comprehend how short-form video usage leads to different psychological states. Additionally, it would be challenging to differentiate the characteristics and functions of different social media platforms without insights into the function of each element. Therefore, this study adopts the short-form video system features of Tian et al. (2023) to investigate how these elements influence consumers' psychological states and behaviors.

Second, although several studies emphasize psychological factors related to addiction, the formation of such addictive disorders has not been well clarified (Zhang et al., 2019). Most research investigating addictive and compulsive behavior just only recognizes the pessimistic psychological factors leading to such behavior, which in short is negative avoidance. Short-form videos also generate positive psychological states such as perceived enjoyment (Tian et al., 2023), engagement (Dong et al., 2023), or interpersonal attachment (Zhang et al., 2019), which the users crave. Hence, this study employs opponent process theory (OTP) with the interaction of opponent reinforcement (positive and negative) to acknowledge the dual mechanism resulting in addiction.

Third, prior studies investigating the impact of short-form videos tend to focus more on the psychological state such as addiction. Few studies have attempted to connect addiction to specific behavioral outcomes. A lack of behavioral outcome makes it difficult to pinpoint the effects of addiction on the individual as well as the society. Additionally, research has shown that internet addiction is closely related to compulsive buying and has directed future studies to examine whether this relationship appears in regard of other specialized applications (Lee, Park & Bryan Lee, 2016). In order to fill this gap, this study extrapolates the established connection between internet addiction and compulsive buying behavior to short-form video (Pahlevan Sharif & Yeoh, 2018; Lee et al., 2016).

2. Literature and Framework

2.1. Theory and Framework

Stimulus – Organism – Response Model, as conceptualized by Mehrabian and Russell (1974) outlines that external stimuli prompt internal cognitive and emotional states (the organism), culminating in corresponding behavioral responses. Therefore, attributes of short videos are regarded as essential stimuli for interaction in this study. These attributes are designed to evoke users' motivational needs and influence their psychological states. Opponent Process Theory postulates that numerous hedonic, affective, or emotional responses are naturally counteracted within the central nervous system, diminishing the force associated with favorable and aversive hedonic feelings (Solomon & Corbit, 1974). The central concept of the theory highlights the interaction between positive reinforcement and negative

reinforcement mechanisms, leading to the development of technology addiction.

Along with proposed research model, there were 10 hypotheses to test as following:

Hypothesis 1. Engagement during the usage of TikTok will positively influence TikTok addiction.

Hypothesis 2. Engagement during the usage of TikTok will positively influence compulsive buying behavior.

Hypothesis 3. Fear of Missing Out (FoMO) during the usage of TikTok positively influence TikTok user engagement.

Hypothesis 4. Fear of Missing Out (FoMO) obtained during the usage of TikTok has positive influence on TikTok addiction.

Hypothesis 5. Fear of Missing Out (FoMO) during the usage of TikTok positively influence user's compulsive buying behavior.

Hypothesis 6. Immersion features positively influence user engagement during usage of TikTok.

Hypothesis 7. Social features positively influence user engagement during usage of TikTok.

Hypothesis 8. Social features positively influence FoMO during usage of TikTok.

Hypothesis 9. Control features positively influence FoMO during usage of TikTok.

Hypothesis 10. TikTok addiction positively influence user compulsive buying behavior.

3. Method and Results

3.1. Hypothesis Testing Result

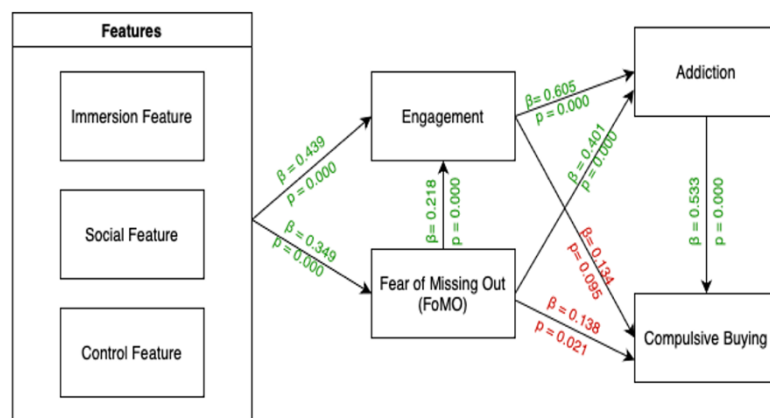


Figure 1: Hypothesis Testing Result

After running CFA, the decision to revise the model in the features package arrived. Features were set to combine into one general variable. The research model was adjusted in the features variables by combining three prior features (e.g., Immersion, Social, Control) into one general construct. The total number of hypotheses for this research after reviewing the model is 8, 2 hypotheses were reduced compared to the original model version.

Using a 95% confidence level standard, the significance level of ENGA's impact on CBU is $0.095 > 0.05$, indicating that the ENGA variable does not have an impact on CBU; the significance level of FoMO's impact on CBU is $0.021 > 0.05$, indicating that the FoMO variable does not have an impact on CBU. The remaining variables all have a significance level of 0.000, therefore, these relationships are all significant. Overall, FEA impacts both ENGA and FoMO, FoMO impacts ENGA, and both ENGA and FoMO impact ADD but barely exerts a direct impact on CBU. The relationship between ADD and CBU is significant when the impact between the two variables is demonstrated. Moreover, all values in the Regression Weight exhibit positivity, signifying a positive impact or alignment, meanwhile negative values imply an opposing relationship.

4. Discussion

This study findings provide some theoretical contributions to the literature.

Firstly, this study contributes to the short-form video literature by exploring how different system elements give rise to different psychological states. The confirmatory analysis results show that the three system elements fit better when combined into one big variable. This finding is unexpected and contradicts prior studies in short-form video literature (Tian et al., 2023). This study speculates that when users are consuming short-form video content, they are fully immersed in the activity. In turn, this leads to mindless scrolling behavior (de Segovia Vicente, Van Gaeveren, Murphy, & Vanden Abeele, 2024). When users get caught up in mindless scrolling, the importance of each of the features does not matter in this stage but the smooth operation process gains more concerns. Users in this state will require a process and sequence of app usage where the activities and interactions between features become more

seamless, ensuring a consistent experience throughout and enhancing the immersive experience with the app. Therefore, it would be interesting if future studies could explore how the interaction between individual attributes and the system elements gives rise to this phenomenon.

Secondly, this study enriches the application of Opponent Process Theory in studying addiction behavior in which the core design of the system exerts influence on the psychological states forming addiction behavior. The study extends Tian et al. (2023) work that utilizes OPT in studying short-form video applications by using dual opponent emotions (e.g., engagement and FoMO) and examining how this pair affects addiction. The result showed consistency with prior work that users must navigate an emotional mechanism in which two opposing emotions simultaneously arise, thereby perpetuating app usage.

Thirdly, the finding of the study caters to the current literature review of compulsive buying that addiction exerts a positive effect on the occurrence of compulsive buying. This finding is consistent with the findings of prior research that addictive and compulsive behaviors coexist in the context of online media usage (Lee et al., 2016). Indeed, while the user engages in short-form videos, various contents, and materials in the app provide users with a wide array of advertisements, which stimulates unexpected needs for the products. The urgent need for an item can persist even after the user has scrolled past a video or advertisement, or even after exiting the app. Hence, this study contributes to the social media literature by providing empirical evidence that links addiction and compulsive buying behavior in short-form videos.

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MS0056: Negative Celebrity Publicity Influencing Consumers' Attitudes Toward the Celebrity and the Endorsed Brand: The Case of Vietnamese Generation Z

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Negative Celebrity Publicity Influencing Consumers' Attitudes Toward the Celebrity and the Endorsed Brand: The Case of Vietnamese Generation Z

Extended Abstract

This paper examines how negative publicity affects consumers' perceptions of celebrities and endorsed brands. Using attribution and associative learning theories, it explains how consumers' moral judgments of celebrities might influence brand perceptions. Results from a Vietnamese Gen Z sample highlight that attribution locus significantly impacts consumer perceptions, with moral reputation mediating the relationship. Societal damage and brand commitment significantly moderate these effects. The major implication is the indirect influence of negative celebrity publicity on endorsed brands, suggesting careful consideration of both celebrities and brands during the endorsement process.

Keywords: Celebrity Endorsement, Negative Publicity, Endorsed Brand, Vietnam

1. Introduction

A prevalent sentiment among celebrity and influencer scholars is that marketers should associate their brands with celebrities in order to enhance their brand image (Schimmelfennig & Hunt, 2020). While celebrity endorsements can be beneficial, controversies involving celebrities can negatively affect the associated brands (Fong & Wyer, 2012). Despite the widespread impact of negative publicity, comprehensive research remains limited (Halder et al., 2021). To gain a more holistic understanding of the mechanisms underlying celebrity and brand relationships, this study aims to explore consumers' perceptions of celebrity scandals and their influences on the brand (Bergkvist & Zhou, 2016).

Halder et al. (2021) call for further research to explore contextual factors influencing the positive image transfer between the celebrity and the brand. This study contended that the same argument applies to the mechanism in which the consumer perception of the celebrity scandal transfers to the brand. Hence, this study aims to explore the influences of different moderators, such as perceived societal damage, brand commitment, or the match-up effect, on this process. Integrating these contemporary moderators is crucial for a thorough understanding of their influence.

Finally, the topic of this study is particularly relevant for conservative countries, where consumers tend to hold more negative perceptions of celebrity scandals. Confucianism’s values, such as righteousness and truthfulness, commonly have significant impacts on the individual and societal attitudes of many Asian countries. Therefore, by conducting this study in Vietnam, the findings could provide a foundation for further research to generalize our knowledge of this mechanism.

2. Literature and Framework

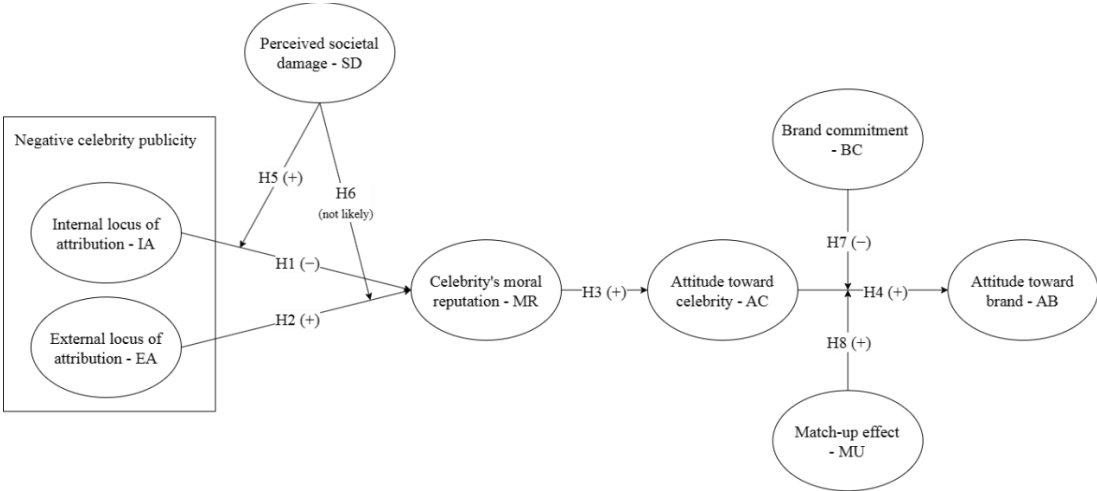


Figure 1. The proposed hypothesized model

2.1 Background theories

Attribution theory posits that individuals ascribe causes of events to internal or external factors, providing insights into consumer responses to negative celebrity publicity (Zhou & Whitla, 2013). Associative learning theory (ALT) conceptualizes memory as a network where the recall of one concept activates related ones. Consequently, negative information can trigger associated nodes, resulting in less favorable evaluations of celebrities and brands (Hussain et al., 2023).

2.2 Locus of attribution and its impact on moral reputation

Locus of attribution refers to attributing events to internal (personal) or external (situational) factors (Folkes et al., 1987). Moral reputation is the evaluation of an individual's morality (Zhou & Whitla, 2013). Research indicates that people make quick moral judgments, leading to immediate acceptance or rejection (Greene & Haidt, 2002). A celebrity's moral reputation declines if behavior is seen as an internal flaw but may elicit empathy if attributed to external factors (Zhou & Whitla, 2013).

Hypothesis 1. Internal locus of attribution negatively influences moral reputation.

Hypothesis 2. External locus of attribution positively influences moral reputation.

2.3 Consumers' attitudes toward the celebrity and the endorsed brand

Research, including Zhou and Whitla (2013), demonstrates that perceptions of a celebrity's moral integrity significantly impact their appeal and credibility, influencing consumer reactions. ALT suggests that while repeated exposure reinforces the brand-endorser connection, negative publicity can also diminish the brand's perceived value (Um, 2013).

Hypothesis 3: Moral reputation positively influences consumers' attitudes toward the celebrity.

Hypothesis 3a: Moral reputation mediates the relationship between locus of attribution (both internal & external) and consumers' attitudes toward the celebrity.

Hypothesis 4: Consumers' attitudes toward the celebrity positively impacts their attitudes toward the endorsed brand.

Hypothesis 4a: Moral reputation and attitudes toward celebrity mediate the relationship between locus of attribution (both internal & external) and consumers' attitudes toward the endorsed brand.

2.4 Moderating effects of perceived societal damage, brand commitment, and match-up effects

Perceived societal damage reflects consumers' assessment of an action's broader societal impact, with criticism intensifying when the action affects others (Zhou & Whitla, 2013). Brand commitment entails a strong emotional connection to a brand, leading loyal consumers to dismiss negative information, while less committed individuals may respond differently (Um, 2016). The "match-up" effect describes the congruence between a celebrity and a brand, with a better fit enhancing the association and potentially increasing the likelihood of negative attitudes transferring to the brand (Till & Busler, 1998).

Hypothesis 5. Perceived societal damage is likely to magnify the impact of internal attribution on moral reputation.

Hypothesis 6. Perceived societal damage is *unlikely* to magnify the impact of external attribution on moral reputation.

Hypothesis 7. Brand commitment negatively moderates the influence of consumers' attitudes toward celebrity on their attitudes toward endorsed brand.

Hypothesis 8. The match-up effect positively moderates the influence of consumers' attitudes toward celebrity on their attitudes toward endorsed brand.

3. Method and Results

This study examines negative celebrity publicity using real cases in Vietnam. A pretest was conducted with a group of 44 Gen Z individuals to rate the impact of various cases on celebrities and brands. The shortlist was based on celebrity popularity and the publicity's impact. The pretest results showed that the scandal of Jack 97, a Vietnamese male singer whose career suffered due to a child support scandal, was chosen for its greater relevance to the Gen Z demographic.

Table 1. Hypothesis testing results

	Paths	β	P	Result
H1	IA \rightarrow MR	-.683	***	S
H2	EA \rightarrow MR	.365	***	S
H3	MR \rightarrow AC	.585	***	S
H4	AC \rightarrow AB	.532	***	S
H3a	IA \rightarrow MR \rightarrow AC	-.399	.002	S
	EA \rightarrow MR \rightarrow AC	.213	.002	
H4a	IA \rightarrow MR \rightarrow AC \rightarrow AB	-.212	.001	S
	EA \rightarrow MR \rightarrow AC \rightarrow AB	.114	.001	
H5	IA \times SD \rightarrow MR	.194	***	S
H6	EA \times SD \rightarrow MR	-.210	***	NS
H7	AC \times BC \rightarrow AB	-.135	.006	S
H8	AC \times MU \rightarrow AB	.014	.801	NS

Note: β are the standardized path coefficients, ***p < .001, "S" is supported, "NS" is not supported

A large-scale survey yielded 329 responses via Google Forms, with 310 valid responses collected from primarily full-time university students aged 18 to 27 in Ho Chi Minh City, Vietnam. The data exhibited satisfactory reliability and validity. Confirmatory factor analysis (CFA) indicated an acceptable model fit (CMIN/DF = 2.007; CFI = .944; GFI = .852; TLI = .935; RMSEA = .057).

Please refers to Table 1 for hypothesis testing results.

4. Discussion

This research contributes to the existing body of theoretical knowledge. Firstly, it expands the understanding of celebrity endorsements in Vietnam by incorporating negative publicity into ALT, again reinforcing the notion that ALT applies not only to positive influence but also to negative impacts on the brand. Not only that, by integrating attribution theory (how consumers interpret the source of bad press

and its effect on their perception of the celebrity) and ALT (linking the celebrity to the brand), this study provides a robust framework for understanding how negative celebrity publicity can significantly impact the celebrity, which then transfers to the endorsed brand.

Secondly, this framework addresses inconsistencies in prior studies that found no direct link between negative celebrity publicity and brand perception. By employing attribution theory, this study shows that attribution locus significantly influences the perception of celebrity's moral reputation during negative publicity. The findings are in line with attribution theory. Internal attributions lead to harsh judgments, while external attributions result in greater tolerance. Furthermore, when evaluating negative publicity, societal damage emerges as a crucial factor that consumers consider. The more they perceive the scandal as damaging to society, the more those attributing blame to internal factors has negative influence the celebrity's image. The opposite effect holds true when the follower attributed external factors for the scandal.

Thirdly, this study also contributes to existing literature on celebrity/influencer endorsements. Our findings highlight the critical role of strong brand commitment in mitigating the negative impact of celebrity scandals. When consumers exhibit high brand loyalty, they become less susceptible to factors that could damage the brand's reputation. Consequently, brand commitment acts as a protective shield, reducing the adverse effects of negative celebrity publicity. Furthermore, prior studies suggest that higher compatibility between the brand and the celebrity strengthens the positive relationship between attitudes toward the celebrity and the brand. However, this study shows that in a negative context, celebrity-brand congruency does not moderate the relationship between the celebrity's image and consumer attitudes toward the brand. Hence, this study provides empirical evidence that, during negative publicity, consumers appear less sensitive to celebrity-brand compatibility. This effect could be due to the brand employing multiple celebrities as ambassadors. Therefore, future studies could further explore the moderating effects of celebrity-brand congruency (the match-up effect) in negative contexts to gain more insights into this phenomenon.

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MS0057: Research on the Innovation Performance of Traditional Manufacturing Enterprises in the Digital Economy

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Research on the Innovation Performance of Traditional Manufacturing Enterprises in the Digital Economy

Abstract

This study uses fuzzy set qualitative comparative analysis (fsQCA) to examine data from 99 traditional Chinese manufacturing enterprises. It investigates the relationship between configurations of big data analytics capability, sensing capability, absorptive capability, and digital empowerment, and high innovation performance. The findings reveal a configurational relationship among these factors that enhances innovation performance. Specifically, a robust big data analytics capability combined with digital empowerment, along with either strong sensing ability or weak absorptive capacity, can enhance innovation performance. Furthermore, when both big data analytics capability and absorptive capacity are strong, they can reduce costs and improve innovation performance.

Keywords: Innovation Performance; Dynamic Capabilities; Big Data Analytics Capability; Digital Empowerment; Fuzzy Set Qualitative Comparative Analysis (fsQCA)

1.Introduction

In the digital era, traditional manufacturing firms face the critical need to innovate by adapting to a rapidly changing external environment. New digital technologies such as mobile, artificial intelligence, cloud computing, blockchain, and the Internet of Things (IoT) are driving this need for innovation. Firms must develop various capabilities to respond effectively to digitalization and foster innovation. Studies have examined several capabilities that facilitate innovation, e.g. big data analytics capability (BDAC), (Gupta & George, 2016; Wamba et al., 2017); dynamic capabilities (DC) (Teece et al., 1997); and digital empowerment (DE).

While each of these capabilities individually contributes to innovation, they do not operate in isolation. Instead, they interact and combine to influence innovation performance. Innovation performance reflects the integrated effect of a system of elements(Li, Zhao, & Wan, 2014). Past studies often used linear methods to test causality (e.g. Ghasemaghaei & Calic, 2020; Wamba et al., 2017), which may not accurately capture the complex relationships between variables. It remains unclear which combinations of these capabilities can best facilitate innovation performance in the Chinese digital economy.

To address this research gap, the present study adopts a holistic perspective and conducts a fuzzy-set qualitative comparative analysis (fsQCA) on traditional manufacturing firms in Jiangxi Province. We adopt a capability perspective, integrating big data analytics capability, dynamic capabilities, and digital enablement into a single framework, rather than focusing solely on singular determinants of innovation performance. Based on our findings, we will provide several solutions from a configurational perspective to enhance innovation performance in traditional manufacturing firms, thereby enabling them to better adapt to rapidly changing environments and achieve sustained growth.

2.Literature

2.1 Innovation Performance

Drawing on previous literature, this paper defines innovation performance as the economic benefits brought to the firm at the end of the innovation activities carried out by the firm (Chen, Huang, Liu, Min, & Zhou, 2018). Corporate innovation performance has become a topic of wide academic interest in recent years. Past research has explored innovation performance from various perspectives, including capabilities and resources(e.g. Gruber et al., 2010; Kamasak, 2015; Lin et al., 2016). Among these, the capability theory is a significant viewpoint that reflects the interaction between firms and their external environment, serving as a crucial complement and description to the resource-based view. Notably, studies have shown that dynamic capabilities have a significant impact on innovation performance, explaining a substantial portion of the variance in firms' ability to innovate (Teece, 2007). In recent years, digital capabilities, including big data analytics capability(Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016) and digital empowerment, have also been found to have a significant influence on firms' innovation performance.

2.2 Dynamic capabilities

Considering that competitive companies can respond to changes in a timely manner and innovate quickly and flexibly (Teece et al., 1997), dynamic capabilities (DC) has been extensively discussed (Khan et al., 2022). DC can contribute to the innovation performance of enterprises in various ways, such as better adapt to the environment (Teece et al., 1997) and enhance the knowledge base of the enterprise (Wang & Ahmed, 2007). In this study, we specifically divides it into two types: one is the sensing capability(SC) to obtain and analyze information from the external environment, perceive external opportunities, and identify opportunities for innovation (Teece, 2007); the second is the absorptive capability(AC) to

assimilate, utilize, and transform the resources obtained to align with the enterprise's development and serve the absorptive capacity of enterprise innovation (Lin et al., 2016).

2.3 Big data analytics capability

Previous studies have shown that big data analytics capability can enable businesses to identify new business opportunities more quickly, thereby enhancing their innovation performance (Akter et al., 2016). Additionally, BDAC is considered "the main differentiator between high-performance and low-performance organizations" (Liu, 2014). Specifically, BDAC allows enterprises to transform large volumes of data into valuable resources for decision analysis (Khan et al., 2022), and it also helps to enhance innovation capabilities and foster the generation of new ideas (Ferraris et al., 2018). Consequently, enterprises can utilize digital tools to change their management and practice methods, thereby cultivating new competitive advantages and ultimately improving innovation performance (George et al., 2014).

2.4 Digital empowerment in Chinese

China's unique economic system makes digital empowerment equally important in corporate innovation performance, and currently, digital empowerment is still in the exploratory stage. Existing research has shown that digital empowerment improves resource utilization, enhances resource acquisition and integration by transforming traditional business processes and procedures, and empowers innovative entities with digital capabilities (Li et al., 2022). This stimulation of potential capabilities in production, innovation, and so forth ultimately promotes innovation performance (Liang & Ye, 2023).

2.5 Summary

In summary, although these literatures have greatly helped us improve our understanding of the factors affecting innovation performance, existing research has mostly considered their linear relationships and

has not considered the combined effects of multiple factors. Different reasons may lead to the same result, and the factors affecting enterprise innovation performance are not singular.

3.Method and results

3.1 Method

The Qualitative Comparative Analysis (QCA) method was first proposed by Charles C. Ragin in 1987 and subsequently developed in the 1980s. It is a case-study oriented theoretical ensemble research method. In contrast to previous linear studies, QCA is a method of group analysis based on Boolean algebra and set theory. It considers cases as wholes of causal conditions and explores the occurrence of complex social problems induced by multiple concurrent causation in a holistic manner by analysing the sufficient and necessary relationships between antecedent conditions and outcomes (Ragin, 2008).

3.2 Data and sample

The research primarily utilized a questionnaire method, targeting innovation leaders and executives from traditional manufacturing firms in Jiangxi Province. Conducted from mid-January to mid-February 2024, the study employed an electronic questionnaire, facilitated by Questionnaire Star, distributed among contacts at familial and friends' co-operative enterprises. Out of 103 retrieved questionnaires, 99 were deemed valid post-screening, achieving a robust recovery rate of 96.17%.

3.3 Variables

In reality, many variables are continuous and cannot be binary divided. If continuous data is binary divided, it may lead to information loss. fsQCA converts variables into 0-1 instead of binary variables. The conditional variables are primarily assessed in terms of BDAC, DC (sensing capability, absorptive capability) and digital empowerment, with a total of 19 questions. In this study, a five-point Likert scale was employed, whereby a score of 1 to 5, as chosen by the research participants, represents the following

responses: "strongly disagree", "disagree", "generally", "agree" and "strongly agree".

3.4 Data Calibration

In this study, four variables—big data analytics capability, sensing capability, absorptive capacity, and digital empowerment—were used to gauge innovation performance, assessed via a 1-5 Likert-scale questionnaire ("Strongly Disagree" to "Strongly Agree"). Following Fiss et al., anchor points were set at 1, 3, and 5 for data calibration.

3.5 Results

After calibrating each variable, we test whether a single condition constitutes a necessary condition for innovation performance. Table 1 demonstrates the way the influencing factors are combined in improving innovation performance in traditional manufacturing firms. Three configurations are identified and can be considered sufficiently conditional combinations of the effects of innovation performance in traditional manufacturing firms.

4. Discussion

Results indicate that distinct capability combinations can facilitate traditional manufacturing enterprises in enhancing innovation performance, with Big Data Analytical Capability (BDAC) consistently surfacing as a pivotal condition across all pathways, underscoring its critical role in innovation enhancement. Detailed analysis unfolds as follows:

Configuration 1a: $BDAC * SC * DE \rightarrow IP$. Traditional manufacturing enterprises endowed with strong BDAC and DE, augmented by SC, can amplify their innovation performance, even in the absence of Absorptive capability (AC). Configuration 1b: $BDAC * \sim AC * DE \rightarrow IP$. This configuration illustrates a path that, regardless of whether there is a high sensing capability, even if there is a lack of absorption ability, traditional manufacturing enterprises with strong big data analysis capabilities and digital

empowerment will improve their innovation performance.

The rationale behind configurations 1a and 1b's efficacy in boosting innovation performance lies in dual aspects: Firstly, companies equipped with high BDAC and DE can adeptly discern and forecast target customer demands through data analysis, curtail costs and mitigate risks. Simultaneously, DE fortifies technological innovation capabilities in traditional manufacturing sectors, bolstering industry competitiveness. Hence, despite lacking AC, configuration 1b can still invigorate innovation performance. Secondly, configuration 1a, on the foundation of BDAC and DE, harnesses SC to survey the external environment, scrutinizing latent opportunities and threats, facilitating swifter responses to nascent risks. Juxtaposing configurations 1a and 1b reveals that within a fluctuating competitive milieu, when traditional manufacturers possess elevated BDAC and DE, high SC and non-high AC exhibit a degree of substitutability. The synergy between high BDAC and DE is insufficient to constitute a sufficient condition for innovation performance enhancement in traditional manufacturing enterprises and necessitates supplementation with high SC or non-high AC.

Configuration 2: $BDAC * AC \rightarrow IP$. Amidst severe domestic and international landscapes, traditional manufacturing enterprises armed with robust capabilities in digital analysis and absorption can still elevate their innovation performance, even in the absence of SC and DE. Configuration 2's potency in augmenting innovation performance stems from enterprises' possession of high BDAC, enabling systematic data organization and filtration, predicting and addressing target customer needs, and curtailing expenses (Ji, 2021). Additionally, high AC facilitates the assimilation and application of external knowledge into inherent competencies, garnering greater benefits from external knowledge (Escribano, Fosfuri, & Tribó, 2009). The amalgamation of these attributes empowers traditional manufacturers to apprehend potential competitive environment alterations, assimilate them as intrinsic

capabilities, trim down costs, and consequently, boost innovation performance.

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Table 1. Analysis of Configurational Results for Factors Influencing Innovation Performance

Antecedent Conditions	Innovation Performance (IP)		
	Configuration 1a	Configuration 1b	Configuration 2
Big Data Analytics Capability (BDAC)	⊕	⊕	⊕
Perceptual Ability (PA)	●		
Absorptive Ability (AA)		○	⊕
Digital Empowerment (DE)	⊕	⊕	
Consistency	0.950	0.913	0.946
Raw Coverage	0.650	0.334	0.757
Unique Coverage	0.027	0.071	0.196
Overall Consistency		0.917	
Overall Coverage		0.919	

Note: ⊕ denotes the presence of a core condition, ● indicates the existence of a supportive condition, ⊗ signifies the absence of a core condition, ○ represents the non-existence of a supportive condition, and a blank space indicates that the condition may or may not appear.



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MS0058: Investigating Confucian Values in Companies: The Impact of Junzi Virtues on Employees' Relationships and Firm Performance

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Extended Abstract

This study investigates the influence of Junzi virtues on employees and firm performance. “Junzi” symbolizes the ideal individual who demonstrates virtues such as benevolence, righteousness, moral conduct, wisdom, and trustworthiness. We develop various propositions to measure the “Junzi” effect on employee outcomes and subsequently aim to investigate firm performance. A mixed-methods approach will be deployed to test the outlined propositions. Samples will be collected from different organizations operating in Hong Kong. This inquiry will contribute to the literature on virtue ethics.

Keyword: Junzi, Virtue Ethics, Confucian Virtues, Employee Outcomes, Firm Performance

1. Introduction

An industry study by PwC revealed a record number of chief executive officers dismissed for “ethical lapses” rather than for poor performance or disagreements with their boards (Green, 2019), stressing the growing need to reverse a worrying trend of unethical behavior in the corporate world (Karlsson et al., 2017). Researchers have long been interested in leaders’ conduct and their effect on company ethics (Hassan et al., 2023). As a recent meta-analysis shows, not only leaders, but also a firm’s ethical climate can effectively empower employees to behave morally in the work environment (Parboteeah et al., 2024). Scholars demonstrate promoting good ethics results in better company financial performance (Choi & Jung, 2008; Verschoor, 1998). Companies with ethical corporate cultures outperform others by 40% in business performance (Grace, 2023). Characterizing the virtuous character of ethical employees and firms is, nonetheless, a challenging matter (Chun, 2019). Traditionally, most researchers have adopted Western analytic approaches to ethics (Maignan & Ralston, 2002) and limited research has been undertaken about the impact of Eastern-derived moral values.

“Junzi” is a concept derived from ancient Chinese philosophy and could potentially be an alternative concept to guide how Western companies promote ethics. The meaning of Junzi translates to a “Noble



Man” (Tan, 2015), and is rooted in the renowned philosophy established by Confucius (551–479 BC). Confucianism provides all-encompassing principles for guiding appropriate individual conduct (Fung, 1952) with emphasis on a person’s morality, inner virtue, and respect for individuals and society. Virtues are analogous to a person’s internal values that shape an individual's character (Whetstone, 2001). Scholars have considered Junzi virtues to be a culturally specific organizational orientation (Tian et al., 2020) and early studies show that companies’ adoption of Junzi virtues has positive effects on corporate reputation and performance in Asian contexts (Tian et al., 2022). While scholars believe that firms led by leaders who adopt a code of ethics aligned with “Junzi” should experience better performance (Lamond, 2012), there has been little research into how the manifestation of the Junzi virtues in a firm’s culture can positively influence employee positive relationships, wellbeing and company performance. Thus, this study aims to address the following research objectives: (1) examine the effects of corporate adoption of Junzi virtues on the behavior of employees and (2) investigate the relationship between corporate adoption of Junzi virtues and firm performance as mediated by the behavior of employees.

2. Literature review

Within traditional Confucian literature, the concept of “Junzi” recognizes individuals who embody five distinct virtues (Wūcháng, 2009). The first virtue, “Ren”, is understood as benevolence. Individuals who demonstrate this value tend exhibit care for humanity (Cua, 2007). The second virtue, “Yi” is associated with righteousness. Confucius emphasized that people with “Yi” tend to engage in morally correct conduct (Cua, 2007). This entails the pursuit of inherently right actions. The third virtue, “Li”, represents propriety. Cua (2007) explained this as a “code of formal rules of proper conduct” which includes adhering to social etiquette, norms, and protocols (Ip, 2009). Fourth, “Zhi” virtue implies wisdom. According to Lamond (2012), individuals with “Zhi” when faced with choices have the capacity to make the right decision. People with this virtue can think prudently, analyze circumstances, exercise judgment, and develop well-thought-out plans of action executed with good intentions. Lastly, the virtue of “Xin” pertains to trustworthiness and is thought to be linked with faithfulness, integrity, sincerity (Chen, 2018). A small body of literature has emerged, investigating the “Junzi” concept in the business world, and applying it to evaluate a firm’s management practices (Rarick, 2008; Snell et al., 2022). The concept of “Junzi Orientation” (Tian et al., 2020) is defined as the degree of practical implementation of the Junzi philosophy in the activities of a particular enterprise. This, and the synonymous concept of “Junzi

Corporation” (Kwong et al., 2015) indicates the degree of adherence to the above virtues in firms’ everyday operations. A literature review by Snell et al. (2022) showcased an increased interest in the concept, and the authors identified 16 studies examining “Junzi” orientation in various corporations. Snell et al.’s (2022) review highlights a need for international research, only one study has been conducted outside of Asia.

3. Propositions

The first virtue of Junzi is ‘Ren’, and it is understood as benevolence. Companies with benevolent leaders have managements that avoid engaging in behaviors that are humiliating (Pellegrini & Scandura, 2008). Benevolent leaders tend to care more about their workforce and ensure an inclusive environment (Luu, 2019). Therefore ‘Ren’ companies should experience better interdepartmental connectedness. Benevolence in companies is associated with creative employees, who are characterised as individuals who fulfil set goals which are set apart from defined tasks (Ogbeibu et al., 2018). Companionable business environments encourage workplace harmonious passion, which is understood as a particular kind of employee’s motivational state (Shen et al., 2023). Thus, ‘Ren’ – minded individuals in leadership positions tend to stimulate a more motivated work environment. Psychology studies indicate benevolent individuals tend to be more cooperatively oriented, rather than focusing narrowly on maximizing their own interests (Capraro et al., 2014). Researchers interpret “Ren” as “goodwill” and a desire to build and develop quality relationships (Rarick, 2008). Studies on firm dynamics demonstrate that goodwill improves relationship quality between companies (Liu et al., 2018). Hence ‘Ren’ workers tend to be more cooperative. Scholars have shown that paternalistic leaders characterised by benevolence are more effective at managing and reducing interdepartmental conflicts (Cheah et al., 2022) and there is a clear positive relationship between benevolent leadership and employee organizational citizenship behavior (OCB) (Chan & Mak, 2012).

Proposition 1. An organization that has firmly embraced the “Ren” Junzi virtue is likely to engender positive relationship quality among its employees.

The second virtue “Yi” is associated with correct moral conduct, thus Yi companies’ ethical employee conduct within the organization. In a sample of sales representatives, business scholars discovered that ethical leadership fosters positive OCB such as helping co-workers in what is a traditionally competitive, sales environment (DeConinck, 2015). Similarly, Yi employees appreciate the importance of helping



colleagues even if such an attitude would paradoxically put them in a potentially disadvantaged position. ‘Yi’ workers will tend to be more cooperative since they are driven by righteousness. Virtuous individuals who share ‘Yi’ values will be more motivated and contribute to organizational behaviours, because when ethical individuals engage with each other they feel a sense of togetherness. This link is clear in the literature, for example, churchgoers who have perceived moral similarity develop a feeling of connectedness (Brown et al., 2022). The literature on pro-social behavior shows an association between good moral conduct and helping behaviors (Karlan & List, 2020). ‘Yi’ individuals are likely to positively affect the sense of interdepartmental connectedness. Conversely, companies leaders who are unethically minded will likely give rise to employees’ unethical pro-organizational behaviour conduct (Wang & Li, 2019). Company leaders’ unethical leadership will influence employees’ moral judgement which result in their deviant behaviours (Resick et al., 2013) leading to interdepartmental conflicts.

Proposition 2. An organization that has firmly embraced the “Yi” Junzi virtue is likely to engender positive relationship quality among its employees.

The third virtue, “Li” translates to harmony, where individuals seek sincerity in relationships, thus workers with “Li” will emphasise respect in interactions with others. Scholars analysing workplace relationships among older generations found that employees, who value respect by showing appreciation and trust and actively cooperate with colleagues are not only more motivated but also enjoy higher employment satisfaction (Rožman et al., 2020). Furthermore, the link between “Li” and harmony can be understood from the perspective of organizational justice, that is employees’ perception of how fairly or unfairly individuals are treated by firms (Hashish, 2020). Organizational justice includes procedural justice and Li-oriented employees feel that they should strive to work in environments where processes are fair. Scholars have shown that organizational injustice is associated with workplace deviant behaviours that can contribute to employee conflicts (Henle, 2024). Moreover, organizational justice also involves interactional justice that focuses on the quality of interpersonal treatment (Kobayashi & Kondo, 2019). If the companies engender good levels of interpersonal treatment or harmony among their employees, a feeling of connectedness among employees would be expected. Business scholars show employees’ perception of fairness in the workplace is positively associated with employee’s work engagement and OCB (Farid et al., 2019). Organizations characterized as fair therefore tend to have more motivated employees (Akman, 2018).

Proposition 3. An organization that has firmly embraced the “Li” Junzi virtue is likely to engender positive relationship quality among its employees.

“Zhi” virtue guides individuals who apply wisdom to their actions. In the business world, such a leader would know how to assess if a particular employee is ready for responsibility but also can identify if members of staff should improve their work-life balance (Redín et al., 2023). A leaders' wisdom and employee engagement has been demonstrated by scholars. Ghosh (2015) work shows how organizational leaders who demonstrate spiritual wisdom, i.e., search for a sense of meaning and purpose at work, tend to evoke more OCB among their employees. Further, a study by Thun & Kelloway (2011) found leader wisdom correlated with employees' commitment, well-being, and OCB. Wisdom contributes to outstanding leadership behaviours (McKenna et al., 2009). Managers who possess ‘local wisdom’, an understanding of local culture, religion or knowledge can more effectively stimulate their employee's work motivation and performance (Satria et al., 2020). “Wise” leaders tend to focus on cooperating with others (Paul & Baltes, 2003) and promoting transformational leadership that focuses on developing positive interpersonal relationships (Greaves et al., 2014).

Proposition 4. An organization that has firmly embraced the “Zhi” Junzi virtue is likely to engender positive relationship quality among its employees.

The final virtue, “Xin” virtue indicates trustworthy individuals. Trust is an important aspect of business relationships and is understood as a belief the other party will be honest, fair, and reliable (Morgan and Hunt, 1994). Business studies assessing relationship quality between buyers and sellers show that trust is a key predictor of potential conflicts, cooperation and effective communication between parties (Leonidou et al., 2006). While conflicts are a natural element of workplaces due to differences in approaches to executing tasks, trust moderates the relationship between conflict and conflict response mechanisms (Parayitam et al., 2010). Those who practice ethical leadership are perceived as trustworthy and those trusted leaders give rise to more motivated employees, who engage in OCBs (Piccolo et al., 2010). When employees trust leaders, their job satisfaction increases (Liu et al., 2010). For example, in the business context of fundraising, the main predictor of donation success was related to the trustworthiness of leaders behind campaigns (Purwandari et al., 2023).

Proposition 5. An organization that has firmly embraced the “Xin” Junzi virtue is likely to engender positive relationship quality among its employees.

Relationship quality in a business context is often understood as a multi-level construct (Athanasopoulou, 2009). In this study, we take a similar view, considering firms' internal relationship quality as consisting of multiple dimensions such as interdepartmental connectedness, interdepartmental cooperation, interdepartmental conflict, and employee motivation (e.g. OCB). Existing research has consistently demonstrated the importance for organizations to devote attention to excellent internal relationship quality. Interdepartmental conflict can be understood as a lack of internal market orientation, which are the “shared values and beliefs that provide individuals with norms for behaviours in an organization” (Narver & Slater, 1990), p. 21). Studies show that interdepartmental connectedness, cooperation and conflict affect internal service quality (Braun & Hadwich, 2017), which is a key contributor to external service quality (Parente et al., 2002) and a main determinant of company’s success. Kirca et al. (2005) meta-analysis shows that interdepartmental dynamics (connectedness and positive conflict) have positive consequences on employee outcomes (employee commitment, job satisfaction). OCB includes positive discretionary employee behaviours that are not outlined in job descriptions but contribute to organizational effectiveness (Tepper et al., 2001). Motivated and engaged employees are more committed and thus more likely to be satisfied and less likely to quit employment (Singh et al., 2023).

Proposition 6. Positive relationship quality among the employees within a firm is likely to have a positive impact on firm performance.

4. Proposed Research Methods

Our research will be executed in collaboration with 10 mid-size firms based in Hong Kong operating in different industries. We will focus on firms with different ownership structure, predominantly local (Hong Kong), Chinese and North American firms. Our questionnaire will be distributed to HR and mid-level managers. We will adapt measures from well-established scales (Barnes et al., in press). Our model will be estimated using structural equation modelling (SEM) approach. The survey will be classified into two waves, each involving an 8-week interval. At time 1, we will collaborate with HR departments of companies to send independent links to employees with a questionnaire that will measure their perception of virtues (Ren, Yi, Li, Zhi and Xin) and their perceptions of company relationship quality. In the second wave, we will ask employees about their perception of company performance as well as independently collect information about profitability and ERG ratings. In addition, we will seek information from HR departments about employee retention rates, average tenure and absences.

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6. Appendix

Items	Derived from
<i>Ren: Supporting Employees</i>	
1. My organization listens to my needs and concerns.	Kwong et al. (2015)
2. My organization responds to my needs and concerns.	
3. My organization improves my life.	
4. My organization provides benefits for me.	
5. My organization is kind to me.	
6. My organization makes me feel good.	Barnes et al. (in press)
7. My organization helps me during times of difficulty.	
<i>Yi: Corporate Citizen</i>	
1. My organization puts people and planet before profits.	Tian et al. (2022)
2. My organization minimizes adverse impact on the natural environment.	Kwong et al. (2015)
3. My organization consistently contributes to society even in hard times.	
<i>Li: Mutual Accommodation</i>	
1. My organization seeks mutual understanding when faced with conflict.	Tian et al. (2022)
2. My organization values fairness when resolving any conflict.	
3. My organization seeks to find acceptable solutions when there are conflicting demands.	
4. My organization respects different points of view.	
<i>Zhi: Learning Organization</i>	
1. My organization believes that ongoing learning is essential for long-term survival.	Tian et al. (2022)
2. Learning throughout is a major source of strength at my organization.	
3. Learning for continuous improvement is a core value of my organization.	
4. My organization adapts to changing circumstances while maintaining its core values.	Barnes et al. (in press)
5. My organization uses its expertise for the common good.	
6. My organization harnesses knowledge for technological advances.	
7. My organization values innovation to achieve its vision.	
8. My organization has a realistic long-term vision.	
<i>Xin: Corporate Integrity</i>	
1. My organization values sincerity and genuineness.	Kwong et al. (2015)
2. My organization is true to its word.	Tian et al. (2022)



3. My organization keeps its promises.	
4. My organization keeps its commitments.	
5. My organization openly reports the truth.	
6. My organization is honest.	
7. My organization provides trustworthy and credible information.	



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MS0059: Exploring the Impact of Top Management Team Heterogeneity on Firm Internationalization Through Digital Transformation - Empirical Study on Chinese Listed Firms

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Exploring the Impact of Top Management Team Heterogeneity on Firm Internationalization through Digital Transformation — Empirical Study on Chinese Listed firms

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Extended Abstract

This study investigates how the heterogeneity within top management teams influences firm internationalization amidst environment uncertainty. Utilizing Upper Echelon and Imprinting Theories, the study analyzes data from A-share listed Chinese firms (2012-2022), focusing on the role of TMT heterogeneity and digital transformation in shaping international process. Currently, the analysis is in progress. The complete results, anticipated to offer new insights into the critical role of TMT heterogeneity and digital transformation in driving successful internationalization in today's complex and dynamic business environment, will be detailed in the final presentation at the upcoming conference.

Keyword: TMT Heterogeneity, Firm Internationalization, Digital Transformation, Environmental uncertainty

1. Introduction

Facing challenges like the COVID-19 pandemic, US-China trade frictions, and localized conflicts, global business operations have been deeply impacted, leading to a push towards deglobalization. Yet, the long-term benefits of globalization, such as economic growth and enhanced resource efficiency, remain evident, particularly for developing nations like China, which have become significant players in the global market.

The internationalization of businesses is influenced not only by external factors but also by individual traits of top management teams (TMT) members (Hambrick and Mason, 1984). Decision-makers with different traits may have varying strategic directions or risk preferences, thus potentially choosing international market entry modes that differ in risk levels or investment perspectives (Herrmann and Datta, 2002). Also, for Chinese firms, the adoption of digital technologies has opened new avenues for internationalization, with many using cross-border digital platforms to expand globally.

Prior research has relatively limited attention given to the mediating mechanism of digital transformation between the heterogeneity of these traits and internationalization process. Therefore, this study leverages Upper Echelon Theory and Imprinting Theory to analyze data from A-share listed Chinese firms (2012-2022), assessing the impact of TMT heterogeneity on firm internationalization and the role of digital transformation. Key contributions include examining how TMT heterogeneity influences international strategies, integrating digital transformation to reflect current trends, and incorporating environmental uncertainty to explore strategic adjustments in dynamic conditions.

2. Main Body

2.1. Literature and framework

According to the Upper Echelons theory and Imprinting Theory, the demographic characteristics and experiential imprints of TMT members are closely linked to their cognitive abilities, values, and judgment, which significantly impact organizational behavior through processes such as information processing, resource utilization, and decision-making (Hambrick and Mason, 1984). Highly heterogeneous TMTs possess complex social networks and diverse information channels, allowing firms to quickly adapt to market changes by leveraging both tangible and intangible resources more effectively (Sarto, F., Saggese, S., Viganò, R., & Mauro, M., 2019). Such teams avoid extreme or biased decisions typical of homogeneous groups by embracing varied perspectives and breaking conventional thinking patterns, thereby enhancing decision-making quality. This enriches internationalization strategies with superior judgment and diversified decision-making approaches. Therefore, this study

proposes the Hypothesis 1:

H1: TMT heterogeneity is positively correlated with the process of firm internationalization.

Digital transformation involves integrating digital technology with existing products and digitizing information to revolutionize traditional business processes. The heterogeneity of TMTs enhances firms' capabilities in information processing and digital thinking, thus fostering digital transformation. Digital technology's widespread adoption reshapes global competition, mitigating issues like information asymmetry and legal discrepancies that multinational corporations confront. By improving information flow, digital tools help bridge the gap between multinational and local firms, allowing international businesses to swiftly adjust strategies and optimize offerings, thereby enhancing their international development. Digital advancements also help multinational corporations better understand and meet consumer needs in target markets through comprehensive information platforms. Based on the above, this paper proposes Hypothesis 2:

H2: Digital transformation mediates the relationship between TMT heterogeneity and the firm's internationalization process.

In the complex global landscape characterized by globalization and geopolitical instability, environmental uncertainty presents a significant challenge for businesses entering or expanding in international markets. These markets demand adaptability to unpredictable cultural, political, and economic environments.

The heterogeneity of TMTs enhances a firm's adaptability and flexibility in such uncertain environments. With diverse experiences, knowledge, and cultural backgrounds, TMTs can better identify and analyze external risks and opportunities, enabling more robust and comprehensive internationalization strategies. This heterogeneity aids in diverse information processing and perspective integration during decision-making, fostering innovation and effective problem-solving in complex international settings (Simons,

T., Pelled, L. H., & Smith, K. A., 1999). Thus, This study proposes the following hypothesis :

H3: Environmental uncertainty intensifies the positive impact of TMT heterogeneity on the internationalization process of the firm.

2.2. Method and results

The initial research sample consists of A-share listed companies in China from 2012 to 2022, with data sourced from the CSMAR database and annual report. The sample underwent rigorous screening based on the following criteria: (1) exclusion of firms listed as ST or PT, (2) exclusion of financial sector companies, (3) exclusion of companies that lacked any digital transformation initiatives or had not engaged in internationalization activities over the past decade, and (4) removal of samples with abnormal or missing data. Furthermore, to mitigate the negative impacts of outliers on the data, each variable within the sample was subjected to winsorization at the 1% and 99% levels.

Dependent Variable: The internationalization process is assessed through scope—number of countries with subsidiaries (Vermeulen and Barkema, 2002)—and speed, measured by average overseas sales growth (Shi and Prescott, 2012). **Independent Variable:** TMT heterogeneity is quantified by differences in age, gender, educational, international, professional background, adapted from Zhang, M., Lan, H., Chen, W., & Zeng, P., 2020. **Mediating Variable:** Digital transformation is analyzed through keyword searches in annual reports using Python (Wu, F., Hu, H., Lin, H., & Ren, X., 2021). **Moderating Variable:** Environmental uncertainty is quantified using year-end revenue and year dummies as predictors (Shen, H., Yu, P., & Wu, L., 2012). **Control Variables:** This study controls for firm size and firm age, among other relevant organizational characteristics.

This study employs empirical methods to analyze corporate data, including descriptive statistics, correlation analysis, and regression analysis, to validate the proposed hypotheses. Additionally, robustness checks and endogeneity tests will be conducted to ensure the reliability and persuasiveness of the results. Currently, the analysis is ongoing, and the detailed research findings and conclusions will

be presented at the upcoming conference.

3. Conclusion

This section provides a preliminary discussion based on the expected outcomes of the study, which examines the influence of TMT heterogeneity on firm internationalization processes, particularly through the lens of digital transformation and environmental uncertainty. Although the analysis is ongoing and results are forthcoming, this study hypothesizes that TMT heterogeneity will significantly enhance strategic adaptability in diverse international markets, and that digital transformation will serve as a key mediator by facilitating competitive advantages internationally.

Given that the full results are pending, this discussion remains speculative and will be substantiated or revised in light of the empirical data once it becomes available. The final discussion will incorporate specific data interpretations, discuss the study's limitations, and suggest avenues for future research based on the actual findings.

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MS0060: Female CEOs and Corporate Innovation Investments: Evidence from S&P 1500 IT Firms

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Female CEOs and Corporate Innovation Investments: Evidence from S&P 1500 IT firms

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Abstract

This study examines the impact of CEO gender on corporate innovation investments, incorporating social role theory and upper echelons theory. We also explore how CEO characteristics moderate the effect of female CEOs on innovation investments. Using panel data from S&P 1500 IT firms (2010-2019) and CEO data sourced from LinkedIn and financial reports, we find that female CEOs tend to reduce R&D intensity, suggesting a lower inclination towards innovation investment. Furthermore, we identify that CEO age is an important contingency factor that negatively influences this relationship, indicating that younger female CEOs are more proactive. Implications for research and practice are discussed.

Keyword: CEO gender, CEO age, Innovation investments, Upper Echelons Theory, Social Role Theory

1. Introduction

The AI boom is rapidly advancing in high-tech industries. Although traditionally male-dominated, women have emerged as influential leaders, particularly in ICT sectors. For instance, AMD's CEO, Lisa Su, highlighted her leadership at the 2024 Computex exhibition. Under her guidance, AMD has excelled in the semiconductor and GPU markets, challenging industry giants with significant advancements in processors and graphics technology. Su's success illustrates the growing impact of female leadership in driving technological innovation and reshaping the high-tech industry.

However, existing research hasn't thoroughly examined how female leadership affects corporate innovation investments. While there's extensive literature on gender diversity in leadership, the exact contributions of female CEOs to innovation outcomes are unclear (Javaid et al., 2023). For example, despite Lisa Su's success at AMD, where she led significant advancements, the specific role of female leadership in driving innovation remains uncertain.

In this research, we integrate Upper Echelons Theory (Hambrick and Mason, 1984) and Social Role Theory (Eagly and Crowley, 1986; Eagly and Wood, 2012) to delve deeper into examining the connection between female CEOs and corporate innovation investments within the information technology sector, using panel data from S&P 1500 IT companies spanning 2010 to 2019. Moreover, we aim to clarify whether any contingency factors moderate this relationship, thereby extending the theoretical contributions of UET and SRT. Our contributions will be further expounded upon in the discussion section.

2. Literature and framework

2.1. Women CEOs and Corporate Innovation Investments

Executive gender significantly influences their perceptions and interpretations, affecting strategic decisions and organizational outcomes, making it a crucial factor in shaping corporate innovation

(Hambrick, 2007; Hambrick et al., 1996). Corporate innovation often entails substantial risks and long-term investments, and these risks are heavily influenced by the CEOs' risk-taking behaviors, which are linked to their gender (Tian & Wang, 2014). Studies show that female CEOs often excel in promoting corporate innovation compared to their male peers (e.g., Javaid et al., 2023; Prabowo & Setiawan, 2021), likely due to distinct traits such as emotional sensitivity, strong intuition, a creative spirit, a strong sense of responsibility, and excellent communication and interpersonal skills (Eagly, 2007). These qualities can motivate employees, enhance efficiency, and foster a more innovative environment. This helps CEOs better assess and understand the company's existing resources and make more informed investments in innovation.

However, earlier studies also indicated that women are generally more cautious and exhibit greater risk aversion compared to men (Eckel & Grossman, 2008). In the workplace, female executives tend to favor conservative corporate strategies. Most studies indicate that female CEOs are more prudent and meticulous in their planning when facing risks, and their participation in organizational decision-making generally results in a decrease in the company's risk-taking activities (e.g., Huang & Kisgen, 2013; Palvia et al., 2015). As a result, companies led by female leaders may demonstrate less extensive and less intensive innovation than those managed by their male counterparts (Strohmeier et al., 2017). We thus formulate the following hypotheses:

Hypothesis 1a. *Female CEOs are positively associated with corporate innovation investments.*

Hypothesis 1b. *Female CEOs are negatively associated with corporate innovation investments.*

2.2. The moderating effect¹ of CEOs' Age

Prendergast and Stole (1996) developed a framework suggesting that younger CEOs make more aggressive investments and take greater risks to demonstrate their superior capabilities. Specifically,

¹ In our full paper, we also test the moderating effects of CEOs' educational background (STEM) and tenure. Due to space limitations, we only present the significant moderation effect here.

younger CEOs often overemphasize their viewpoints and take bold investment actions to showcase their talents. This overconfidence may positively impact firm innovation by reducing the fear of failure (Galasso & Simcoe, 2011; Hirshleifer et al., 2012). In contrast, senior CEOs are typically linked to lower financial risk for the firm and decreased research and development spending. This suggests that CEO age directly influences risk reduction. Additionally, senior CEOs often allocate fewer resources to research and development, focus on more varied operations, and keep lower operating leverage (Serfling, 2014). Drawing from these perspectives, we propose the following hypothesis:

Hypothesis 2. *Older CEOs are likely to weaken the positive impact or amplify the negative influence of female CEOs on corporate innovation investments.*

3. Method and results

In this study, we primarily retrieve data from the Compustat database, which includes information on companies listed in the S&P 1500. To avoid anomalies caused by economic turmoil and the COVID-19 pandemic, we collect data on Information Technology (IT) firms from 2010 to 2019, with CEO information sourced from LinkedIn and financial reports. The classification of industries follows the Global Industry Classification Standard (GICS).

We examined the hypotheses using a panel fixed-effects regression analysis, informed by the Hausman test, to evaluate the impact of female CEOs on corporate innovation investments. The Pearson correlation coefficient and variance inflation factor (VIF) were examined to ensure there were no multicollinearity problems. Furthermore, we lagged all independent variables by one year to reduce reverse causality and endogeneity concerns. The Heckman correction method was also employed to address the sample selection bias issue². Table 1 presents the panel regression results. Model 2 supports the baseline hypothesis that female CEOs are associated with significantly reduced R&D

² The results from the Heckman Two-step Correction are consistent with those presented in our main model shown in Table 1.

intensity ($\beta = -0.025, p < 0.05$), indicating that firms with female leadership tend to allocate fewer resources to R&D compared to those led by male CEOs. Thus, Hypothesis 1b is supported. Model 4 includes the interaction between Female CEO and Ln(Age), revealing a negative and statistically significant coefficient for this interaction ($\beta = -0.335, p < 0.001$). This suggests that younger female CEOs are more proactive in innovation investments, thereby supporting Hypothesis 2.

Table 1. Panel Fixed-effects Results.

Note. All independent variables are lagged. Two-tailed tests are used, with statistical significance denoted as *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. Robust standard errors are shown in parentheses.

Variables	R&D intensity					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
STEM	0.002 (0.006)	0.004 (0.006)	0.002 (0.008)	0.006 (0.006)	0.004 (0.006)	0.004 (0.007)
Ln (Age)	0.009 (0.036)	0.018 (0.031)	0.019 (0.031)	0.038 (0.026)	0.018 (0.032)	0.040 (0.026)
Tenure	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Power	0.007 (0.007)	0.010 (0.008)	0.010 (0.008)	0.009 (0.007)	0.009 (0.007)	0.009 (0.007)
Ln (Salary)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.004*** (0.000)	0.005*** (0.001)	0.004*** (0.000)
Ln (Assets)	-0.015*** (0.005)	-0.015*** (0.005)	-0.016*** (0.005)	-0.017*** (0.005)	-0.016*** (0.005)	-0.017*** (0.005)
ROA	-0.063*** (0.028)	-0.063*** (0.028)	-0.063*** (0.028)	-0.053* (0.027)	-0.060** (0.027)	-0.053* (0.027)
Ln (Fage)	0.050 (0.032)	0.058* (0.032)	0.058* (0.032)	0.051 (0.031)	0.054* (0.031)	0.052* (0.031)
Leverage	-0.028 (0.017)	-0.024 (0.015)	-0.024 (0.015)	-0.016 (0.014)	-0.025 (0.015)	-0.016 (0.014)
Growth	0.003* (0.002)	0.004* (0.002)	0.004* (0.002)	0.004** (0.002)	0.004** (0.002)	0.003* (0.002)
Tobin's Q	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.001 (0.002)
Female CEO		-0.025** (0.011)	-0.033** (0.016)	-0.034*** (0.008)	-0.047*** (0.015)	-0.037** (0.016)
Female CEO x STEM			0.025 (0.019)			0.023 (0.014)
Female CEO x Ln (Age)				-0.335*** (0.066)		-0.348*** (0.062)
Female CEO x Tenure					-0.003 (0.002)	0.000 (0.002)
Constant	0.043	0.016	0.019	0.044	0.032	0.045
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-test	2.42***	2.71***	2.96***	10.40***	2.82***	16.02***
Within R-squared	0.122	0.132	0.134	0.151	0.135	0.153
Observations	1,039	1,039	1,039	1,039	1,039	1,039
Groups	205	205	205	205	205	205

4. Discussion

This research offers several contributions. First, we illustrate a notable negative correlation between female CEOs and R&D investments by concentrating on the IT industry, emphasizing the decision-making strategies female leaders use to drive innovation. Second, the research combines insights from

social role theory and upper echelons theory, uncovering the substantial moderating effects of CEO age. This discovery clarifies the dynamics of female leadership and how age shapes strategic decision-making in innovation. Third, this study contributes to the discussion on gender roles and innovation by providing empirical evidence. It shows that female leadership styles emphasize collaboration and empowerment, but risk-averse and conservative tendencies may limit the scope of innovation. Overall, our findings elucidate the link between female CEOs and corporate innovation, contributing to the literature on female leadership, innovation, and gender studies.

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MS0062: How Trending Topics in Social Media and Corporate Response Make Effect to Investors? Evidence from China

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How trending topics in social media and corporate response make effect to investors?

Evidence from China

Abstract: We investigate how firm-related trending topics in social media make effect to investors' behavior by analyzing the sentiment of trending topics and examining the moderating effects of listing time and corporate response. We aim to explain this interesting phenomenon through applying and advancing the perspectives of investor sensemaking and sensegiving. Our findings reveal that the sentiment of trending topics significantly influences corporate abnormal returns. Specifically, for topics with negative sentiment, longer listing time leads to greater changes in abnormal returns, and firms should respond to mitigate the effects, respectively. Conversely, for topics with positive sentiment, longer listing time results in smaller changes in abnormal returns, as well as firms should refrain from responding, respectively. By collecting and analyzing trending topics data from Weibo, we provide empirical support for our hypotheses and contribute to the literature on how social media influences investors' behavior.

Keywords: trending topics, corporate response, abnormal return, investors' behavior

"In the world of Internet Customer Service, it's important to remember your competitor is only one mouse click away." - Doug Warner

1. Introduction

In the eyes of stock investors, how do they treat information in social media and hence influence their investment behavior? Driven by this issue, most existing literature paid attention to the how corporate social media usage affect firm performance (e.g., Blankespoor et al., 2014; Jung et al., 2018; Lee et al., 2015) as more and more firms communicate with investors and consumers through social media (Gu & Kurov, 2020), or analyzing messages in social media to predict stock returns or prices (e.g., Bartov et al., 2018; Chen et al., 2014; Sul et al., 2017) regarding more users publish their opinions to engage discussions in social media. As social media has been integrated into various aspects of users' daily lives (Boyd & Ellison, 2007), investors increasingly depend on information from social media to make their trading decisions (Gu & Kurov, 2020). Also, organizations are facing both opportunities and threats from fast growing social media (Effing & Spil, 2016).

The characteristics of social media, particularly its user-generated content and lack of immediate verification, can significantly influence investors' decisions. A striking example occurred on May 24, 2023, when IFLYTEK's stock price plummeted by more than 9% due to fake news circulated on Weibo. This misinformation, purportedly written by AI, gained widespread attention and demonstrated the potential for social media content to impact market behavior. This disconnect highlights the need for a deeper understanding of how social media shape investor preferences and, consequently, firm performance.

Trending topics on social media platforms serve as significant indicators of public concern, encompassing a mix of verified news and unsubstantiated rumors. This characteristic sharply

distinguishes them from traditional media coverage, as noted by Gu and Kurov (2020), who observed that individual users on social media often engage more readily with rumor-driven posts. While corporate managers have developed extensive experience and strategies for addressing issues in traditional media channels, they may find themselves less equipped to navigate the unique dynamics of social media platforms. The rapid spread of information, the blurring of lines between fact and rumor, and the potential for mass create a complex environment that challenges conventional crisis management approaches. This raises critical questions: How do firm-related trending topics on social media influence investor behavior? And how can firms effectively respond to these trending topics to maximize benefits or mitigate potential threats? We suppose that these questions can catch managers' interest and attention who are facing the imminent threats or uncommon opportunities from social media disclosure.

Focusing on these questions, we argue that (1) different kinds of trending topics directly affect investors' investment behaviors, and (2) different levels of public concern and corporate reactions moderate the above relationship. Barber and Odean (2008) argued that the influence of media reports on stock prices relies on the media's ability to capture and direct investors' attention rather than the quantity of valuable information they provide to investors, and hence, investors may interpret this collective attention as a form of social proof, assuming that if many people are discussing a particular stock or event, it must be important or valuable (Cialdini, 2001). Essentially, we want to integrate the investor sensemaking and sensegiving perspectives to explore how retail investors interpret and react to firm-related trending topics in social media and corporate reactions. This study responds to the call issued by Jiao et al. (2020), Luo et al. (2012), and Xu and Zhang (2013) for how different types of social media contents influence firm performance. Specifically, we examine how trending topics

among three kinds of sentiment (i.e. negative, neutral, and positive) affect investors' investment behaviors by using corporate abnormal return, and how listing time of trending topics and corporate responses moderate this relationship.

In this study, we test our hypotheses by collecting Chinese firm-related trending topics data from Weibo and following corporate responses. Specifically, our results suggest that sentiment of firm-related trending topics is positively related to the corporate abnormal return, as well as both listing time and corporate response negatively moderates the relationship.

Overall, this study makes three significant contributions. First, we enhance the literature on how social media influences investor behavior. While most research in this area focuses on corporate voluntary disclosures or public opinions on social media, our study examines how topics with significant public concern that generate extensive user discussions in social media impact investors from the perspective of investor sensemaking. Our results indicate that the sentiment of trending topics significantly influences investor behavior through corporate abnormal returns, aligning with prior research (e.g., Bartov et al., 2018; Schniederjans et al., 2013; Sul et al., 2017; Ye et al., 2022). Second, we argue that the corporate response and the duration of trending topics moderate this relationship from the perspective of investor sensegiving. Our study provides guidance to firms on effective management practices when firm-related trending topics emerge on social media. Specifically, for trending topics with negative sentiment, a longer listing time leads to a greater change in abnormal returns, and firms should respond to mitigate these changes. Conversely, for trending topics with positive sentiment, a longer listing time leads to a smaller change in abnormal returns, and firms should refrain from responding, respectively. Finally, by collecting firm-related trending topic data from Weibo and using two representative AI tools to analyze their sentiment, we extend the

empirical research scope of social media content. This unique dataset provides evidence on how investor behavior is shaped and influenced by social media trends and their attributes.

2. Literature review

2.1 Media coverage and investors' behavior

Numerous studies have demonstrated that new information, particularly news, is one of the most significant determinants of stock returns and can lead to rapid changes in stock prices (Fama, 1970; Hong et al., 2000; Qian & Rasheed, 2007). Meanwhile, mass media outlets play a crucial role in disseminating information to a wide audience, especially individual investors (Fang & Peress, 2009). Nowadays, social media has been widely used by people, and possess several attributes that generate a more comprehensive disclosure channel compared to the traditional media (Daft & Lengel, 1984; 1986).

Social media platforms allow users to view and share personal comments about corporate operations, stock price predictions, and trading decisions (Cade, 2018). This feature enables individuals to access a vast array of opinions from other users on topics of interest. These unique characteristics let social media as a highly effective tool for influencing others' perception of a company in an innovative and unprecedented way (Miller & Skinner, 2015; Saxton, 2012). As a result, social media has emerged as a powerful force in shaping corporate reputation and influencing investor behavior.

Despite there are significant interaction effect exist on stock performance from both traditional media and social media, totally, social media owns more significant relationship with corporate stock performance than traditional media (Yu et al., 2013). In addition to the information dissemination of

corporate voluntarily publishing or marketing announcements on social media platforms, other studies have found that public opinions on social media can influence stock price estimations. For example, Lin et al. (2016) examined that useful information from social network can evaluate stock price, while some other research use emotion analysis, textual analysis, or data mining to examine the relationship between the information from social media and the stock price (e.g., Ganesh & Iyer, 2023; McGurk et al., 2020). More detailed, Sul et al. (2017) analyzed that total 2.5 million Tweets of S&P 500 corporations to see the cumulative sentiment in two ways (positive and negative), then comparing corporate stock returns, then found the casual relationship between corporate emotional value and stock return. Further, Sprenger et al. (2014) argued that the sentiment of Tweets has relationship between the stock shares, messaging volume, and trading volume, then some other scholars (Ranco et al., 2015) supported this argument in their study. This suggest that social media platforms like Twitter have emerged as powerful conduits for information that can impact stock returns (Bollen et al., 2011; Oh & Sheng, 2011; Sprenger et al., 2014).

In summary, the literature extensively explores the influence of corporate voluntarily publishing or marketing announcements on social media platforms, demonstrating the strategic importance of these activities for corporate communication and investor engagement. Additionally, other studies have found that public opinions on social media can influence stock price estimations, providing valuable insights into the dynamic relationship between social media activity and market behavior. However, a significant gap remains in understanding the impact of third-party generated events with widespread public concern on social media. Unlike firm-initiated communications or individual user-generated posts and public opinions, these third-party events are often spontaneous, unpredictable, and can rapidly gain traction, influencing investor sentiment and behavior in unique ways. This distinction is

crucial, as third-party events are typically external and not directly controlled by the firm or individual users, adding a layer of complexity to how they impact investor behavior. This overlooked area highlights the need for further research to comprehensively grasp how such events shape investor behavior and ultimately affect firm performance, providing a more holistic understanding of the multifaceted influences of social media on the financial markets.

2.2 Social media and investor sensemaking

As individual investors are normally bounded rationality, Barber and Odean (2008) argued that they are more likely to purchase stocks that have recently experienced high media attention, proving a strong link between media coverage and attention-driven buying. Similarly, Fang and Peress (2009) examined the relationship between media coverage and stock returns, finding that stocks with higher media attention tend to have higher returns in the short term. However, this effect is often temporary and may be driven by investor sentiment rather than fundamental value, just like Tetlock (2007) analyzed the tone of media coverage and its impact on market prices, which highlighting the importance of sentiment in driving investor behavior.

Social media serves not just as an information source, but as a platform for collective sensemaking that can significantly impact investors' behavior and, consequently, firm performance. Regarding investors tend to overweight information that is easily accessible or readily available in their minds (Tversky & Kahneman, 1973), thus, we propose that investor sensemaking theory has greatly implications for understanding investor behavior, particularly during times of uncertainty or crisis. It explores how investors interpret and react to make sense of complex and ambiguous information (Weick, 1995), as well as highlights the importance of cognitive and social processes in

shaping investor decisions and market outcomes.

2.3 Corporate response and investor sensegiving

Investor reactions to corporate crises and subsequent responses have also been studied, with scholars focusing on stock market reactions and changes in shareholder value (Jensen & Meckling, 1976; Sturges & Burnett, 2001). Investors tend to make negative reaction to crises that threaten the financial stability or reputation of the firm, leading to decrease in stock prices and market value. This negative reaction can be attributed to several factors, such as increased uncertainty about the company's future prospects, concerns about potential legal liabilities or regulatory sanctions, and the harm of trust in the corporate management and governance practices. In some cases, the exposure of a corporate crisis can trigger a significant drop in stock prices, as investors seek to limit their exposure to potential losses. However, effective corporate responses that address these concerns and restore confidence can mitigate these negative effects (Coombs & Holladay, 2002). Companies are more likely to weather the storm and maintain investor support if they demonstrate a clear understanding of the issues at hand, take swift and decisive action to address the root causes of the crisis, and communicate transparently with stakeholders.

Following Ritchie (2008), response is defined as the ability to reallocate resources and execute crisis communication strategies during an emerging crisis. This stream of literature primarily focuses on corporate crisis management. The term "sensegiving," created by Weick et al. (2005), refers to the process by which organizations create and impart meaning to events, thereby shaping stakeholder interpretations and responses. In the context of corporate crises, sensegiving involves strategic communication aimed at managing reputation and mitigating negative impacts on stakeholders,

including the media and investors. By participating in the conversation, corporations can potentially shape the narrative, provide clarity or additional information, and build trust with their stakeholders (Etter et al., 2019; Yang & Kang, 2009). This proactive approach may help to mitigate the impact of negative sentiment, amplify positive sentiment, and foster a sense of transparency and responsiveness to investors (Coombs & Holladay, 2014; Schultz et al., 2011).

3. Hypotheses development

Trending topics provides a comprehensive view of Chinese public's attention in social media, hence serves as a rapid and easily accessible source of information for investors. As the sensemaking theory suggests, individuals actively seek information to reduce uncertainty and ambiguity (Dervin, 1998). Trending topics aggregate a large volume of user-generated content, providing investors with diverse perspectives and real-time updates on companies, industries, and market trends. Meanwhile, social media users actively participate in the development and dissemination of narratives through trending topics, which can shape investor perceptions and expectations. These can have a significant impact on investor sentiment and, in turn, on stock prices and market dynamics (Shiller, 2017). Through different sentiment sensemaking to investors from each trending topics, as it serves as a symbol to represent the public concern, we expect different sentiment of trending topics to influence corporate abnormal market return, this leads to hypothesis 1:

Hypothesis 1 (H1). The sentiment of firm-related trending topics is positively related to corporate abnormal return.

Listing time as one of the attributes of trending topics, defined as the duration for which a given topic remains on the trending list, serves as an indicator of public interest in a specific event. As Weibo

updates 50 trending topics each minute, the persistence of a topic within this list can be interpreted as a measure of sustained public concern. In the context of investor sensegiving, the listing time of a trending topic can be seen as a signal of the topic's importance and potential impact on the company's reputation and financial performance. Also, as longer listing time may also allow for more noise and irrelevant information for investors to catch, we derive this hypothesis 2 above:

Hypothesis 2 (H2). The listing time of firm-related trending topics weaken the relationship between the sentiment of trending topics and corporate abnormal return.

The existing literature on corporate responses primarily focuses on crisis management (e.g., Berthon, 2010; Dutta & Pullig, 2011; Smart & Vertinsky, 1984), there is a need to address how corporations react when they become a matter of public concern on social media, as well as social media is widely recognized as an important communication platform (Wang et al., 2021). Considering negative trending topics refer to a kind of crisis, through participating in the conversation, corporations can potentially shape the narrative and provide clarity or additional information, as well as build trust with their stakeholders (Etter et al., 2019; Yang & Kang, 2009). However, regarding neutral and positive trending topics, Malkiel (2019) argued that avoiding the hype ensures that investor expectations remain grounded in the firm's inherent value and strategic direction, fostering a more stable and predictable investment environment. Hence, we derive this hypothesis 3 above:

Hypothesis 3 (H3). Corporate response of firm-related trending topics weaken the relationship between the sentiment of trending topics and corporate abnormal return.

The conceptual model is shown in Figure 1.

[Insert Figure 1 about here]

4. Methodology

4.1 Sample

As the main users of Weibo is individual investors (Liu et al., 2018), as well as trending topics function is one of the most popular online news channel for social media users in China, so this study focused on the Chinese market investors.

Our sample involves firm-related trending topics in Weibo of China's A-shared listed firms top 500 corporations from October 25, 2019 to December 31, 2023. The listed companies that ranked by total market capitalization at April 28, 2023 are obtained from Wind database. The trending topics data comes from a website called "trending topics engine", the website is <https://weibo.zhaoyizhe.com/>.

In Chinese, people normally use the corporate abbreviation rather than the full name to call, for example, the Industrial and Commercial Bank of China Limited ("Zhongguo gongshang yinhang" in pinyin), is called "Gonghang" or "Gongshangyinhang" when people mentioned it. So we used different well-known corporate abbreviations of these top 500 corporations to get their related trending topics. In our sample period, the sample size is total 2,087 trending topics of 166 firms after excluding the trending topics occurred before their IPO dates.

4.2 Variables and measures

4.2.1 Abnormal return

To estimate investors' reactions to trending topics, we utilized the market model to calculate the abnormal return on the day following the occurrence of a trending topic ($t = +1$). Specifically, the abnormal return on $t = +1$ serves as our dependent variable to capture the immediate investors' reactions to trending topics. For the calculation of the market model parameters, we used an estimation

window spanning from 200 days to 10 days prior to the event. Within this window, at least 50 trading days were required as the minimum number of trading days within the 365 days preceding the event date. The CSI 300 Index (000300) was employed as the benchmark market index to account for market-wide movements as the index is designed to reflect the overall performance of the Chinese A-share market.

4.2.2 Sentiment

Sentiment analysis can be performed using a variety of methodologies (Feldman, 2013). With the development of artificial intelligence technologies, AI large language models had shown their potential in analyzing and predicting (eg. Lopez-Lira & Tang, 2023; Zhong et al., 2023). Following Lopez-Lira and Tang (2023), they used different versions of ChatGPT to evaluate whether each news headline was positive, negative, or neutral for corporate stock prices. Their findings indicate that ChatGPT outperforms traditional sentiment analysis techniques.

In China, several AI large language models have been developed by internet corporations and trained under Chinese conditions. One of the representative products is Ernie Bot from Baidu. Given that our samples pertain to Chinese corporations and are written in Chinese, we utilized both ChatGPT-4 and Ernie Bot to evaluate the sentiment of each trending topic as positive, neutral, or negative. Each sentiment was then assigned a numerical value (negative sentiment = -1, neutral sentiment = 0, positive sentiment = 1) to create the variable "Sentiment" as our independent variable.

To prompt the AI models, we used the sentence: "Please evaluate (or analyze) whether the sentiment of this trending topic is positive, negative, or neutral for *#the corporation#*, *#the content of trending topic#*," with "the corporation" replaced by the actual firm name. For example: "Please

evaluate (or analyze) whether the sentiment of this trending topic is positive, negative, or neutral for *Moutai Corporation*, #*Moutai ice cream sells nearly ten million cups in a year*#. Additionally, trending topics that were identical to the corporate name or corporate products and did not convey any meaningful sentiment were classified as neutral.

After the sentiment evaluations by two AI models, we compared their responses for consistency. Out of the total evaluations, 1,724 trending topics received consistent sentiment evaluations from both ChatGPT-4 and Ernie Bot. For the remaining 363 trending topics with differing sentiment evaluations, we recruited two postgraduate students as independent coders to carefully review the AI evaluations and their rationales. The coders then provided their own sentiment evaluations based on these rationales. If the two coders agreed on the sentiment, their evaluation was used as the final sentiment. In cases of disagreement, the two coders discussed and debated until reaching a 100% agreement, thereby ensuring inter-rater reliability (Aguinis & Solarino, 2019).

4.2.3 Listing time

As an attribute of trending topics, this variable indicates the duration for which a topic remains prominent on Weibo trending topics list, measured in minutes. We obtained this data also from the website “trending topics engine”.

4.2.4 Response

To create the variable representing corporate responses to related trending topics, we employed a binary coding scheme. Specifically, we designated a dummy variable, Response, to capture the presence or absence of a firm's response after the related trending topic occurred. To determine

whether a firm had responded to the trending topic, we conducted a comprehensive search for related news articles on Google. If a firm responded through a press interview, issued an official statement, or communicated about the trending topic by corporate representative after it occurred, this was coded as 1. Conversely, if no such response could be identified in relation to the trending topic event, or if the responses occurred before the trending topic emerged, this was coded as 0.

4.2.5 Control variables

We controlled several variables that could potentially influence abnormal return and corporate response. All of these variables are directly obtained or calculated raw data from the China Stock Market Accounting Research (CSMAR) database. First, we controlled firm age that measured by the number of years that the firm had been in operation, and firm size, measured as the total sales.

Second, we controlled return on assets (ROA) as it indicates how efficiently a company is using its assets to generate earnings, and net income that direct measure of a firm's profitability.

Third, we controlled the leverage, measured by the ratio of debt to equity, as Highly leveraged firms might be more cautious in their public communications to avoid alarming investors and creditors.

Forth, we controlled state ownership to isolate the impact of ownership structure on corporate behavior. We created a dummy variable, coded 1 if the firm is state-owned, and coded 0 otherwise.

Fifth, we controlled the ratio of expenses to sales, as it indicates the efficiency of a firm's cost management relative to its sales. Firms with a higher ratio may have less flexibility in their budgets for public relations activities.

Finally, we controlled year dummies and industry dummies.

4.2.6 Analytical approach and model

To investigate the impact of the sentiment of trending topics on abnormal returns and how this relationship is moderated by listing time and corporate response, we employed ordinary least squares (OLS) regression to estimate the coefficients of our model by using Stata 18. In our data processing, we treated sentiment evaluations as continuous variables. We specified the following regression model:

$$\begin{aligned} \text{Abnormal Return}_{i,t+1} = & \beta_0 + \beta_1 \text{Sentiment}_{it} + \beta_2 \text{Listing Time}_{it} + \beta_3 \text{Corporate Response}_{it} + \\ & \beta_4 (\text{Sentiment}_{it} \times \text{Listing Time}_{it}) + \beta_5 (\text{Sentiment}_{it} \times \text{Corporate Response}_{it}) + \beta_6 \text{ROA}_{it} + \\ & \beta_7 \text{State Ownership}_{it} + \beta_8 \text{Firm Age}_{it} + \beta_9 \text{Firm Size}_{it} + \beta_{10} \text{Leverage}_{it} + \beta_{11} \text{Net Income}_{it} + \\ & \beta_{12} \text{RES}_{it} + \beta_{13} \text{Industry}_i + \beta_{14} \text{Year}_t + \epsilon_{i,t+1} \end{aligned}$$

5. Results

In table 1, we report the means, standard deviations, and bivariate correlations for the variables used in the study. Regarding all the correlation coefficients are below 0.5, which suggested that multicollinearity was not a problem for our data and estimations. Also, the mean of Sentiment is -0.084, which means majority of firm-related trending topics are negative.

[Insert Table 1 about here]

The results of our hypotheses testing are represented in Table 2. Model 1 serves as the baseline model. Model 2 tests H1, Model 3 tests H2, Model 4 tests H3.

Under Hypothesis 1, we predicted that the Sentiment of firm-related trending topics is positively related to corporate abnormal return. As indicated in Model 2, the coefficient for Sentiment is positive

and significant ($b=0.002$, $p<0.01$), thereby supporting Hypothesis 1.

Next, we test Hypothesis 2, which posits that the Listing Time of firm-related trending topics weakens the relationship between the sentiment of trending topics and corporate abnormal return. Model 3 shows that the coefficient for the interaction between Sentiment and Listing Time is negative and significant ($b=-0.000$, $p<0.1$), supporting Hypothesis 2.

Finally, in Model 4, we test Hypothesis 3, predicting that Corporate Response to firm-related trending topics weakens the relationship between the sentiment of trending topics and corporate abnormal return. The coefficient for the interaction between Sentiment and Corporate Response is negative and significant ($b=-0.005$, $p<0.05$), thus supporting Hypothesis 3.

[Insert Table 2 about here]

To test the robustness of our results, we conducted an additional test to examine the robustness of our hypotheses testing. We changed the benchmark market index by using Shanghai Securities Composite Index (000001) to calculate our dependent variable. Then, we examined the main effects and the moderating effects and the robustness results are presented in Table 3.

[Insert Table 3 about here]

6. Discussion

Motivated by a desire to better understand the social media factors that influence investor behavior, we employed the investor sensemaking perspective to clarify how firm-related trending topics impact investors through various types of sentiment. Additionally, we extend our analysis by examining the moderating effects of listing time of trending topics and corporate response, drawing on the investor sensegiving framework.. This study made several contributions and discussed below.

First, this study contributes to the social media literature by offering the perspective of investor sensemaking and sensegiving to understand investors' reactions. Sensemaking refers to how investors interpret and make sense of information, while sensegiving relates to how firms attempt to influence this interpretation process. As our result suggests that positive relationship between sentiment of firm-related trending topics and corporate abnormal returns, it highlights the role of social media and public concern in investor sensemaking processes as well as their following trading decision-making. This extends our understanding of investor sensemaking in the digital age, demonstrating that investors actively interpret social media sentiment rather than passively receiving information. Furthermore, our analysis of moderating factors offers deeper insights from the perspective of investor sensegiving. The negative moderation effects of trending topics listing time and corporate response on the main relationship provide detailed understanding of sensegiving in social media contexts. These findings provide a more comprehensive understanding of the complex interplay between public concern in social media, corporate communication, and investor behavior.

Second, our findings offer valuable insights for both corporate managers and financial analysts. For corporate managers, the results underscore the importance of considering both the sentiment and the listing time of trending topics when formulating response strategies. For financial analysts, our study highlights the necessity of incorporating social media dynamics into their analytical models.

Third, by leveraging Weibo's trending topics feature, we offer a unique window into the real-time dynamics of information dissemination and interpretation in the Chinese financial market to examine investor sensemaking and corporate sensegiving processes. Unlike previous studies that may have relied on traditional media sources or aggregated social media data, our focus on trending topics provides a more detailed understanding of how information gains traction and influences investor

behavior in the Chinese context. This methodological contribution not only enhances our understanding of social media's role in financial markets, but also provides a template for future research in other emerging markets with dominant local social media platforms.

However, our study presents several limitations. First, the geographical scope of our investigation was confined to China, with the majority of Weibo users being Chinese nationals. This localization potentially limits the generalizability of our findings to other cultural and economic contexts. Second, our sample was restricted to the top 500 A-share listed corporations, which may not fully represent the broader corporate landscape in China or globally. Furthermore, our reliance on Weibo as the sole data source may introduce platform-specific biases. Other popular social media platforms in China, such as Xiaohongshu, or Douyin, might offer different user demographics, engagement patterns, and corporate-consumer interactions, potentially yielding varying insights. Lastly, our binary approach to assessing corporate responses to trending topics (i.e., response or no response) may oversimplify the nuanced strategies companies employ when engaging with different types of trending issues.

These limitations present opportunities for future research to expand the scope and depth of our understanding of corporate social media engagement. Future studies could (1) investigate how different types of investors (e.g., institutional vs. retail) engage in sensemaking of social media information, and (2) explore how sensemaking and sensegiving processes vary across different types of trending topics (e.g., product launches, corporate scandals, macroeconomic events, policy changes), as well as (3) explore how cultural factors might influence the sensemaking of social media information in different national contexts.

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Figure 1. The conceptual model

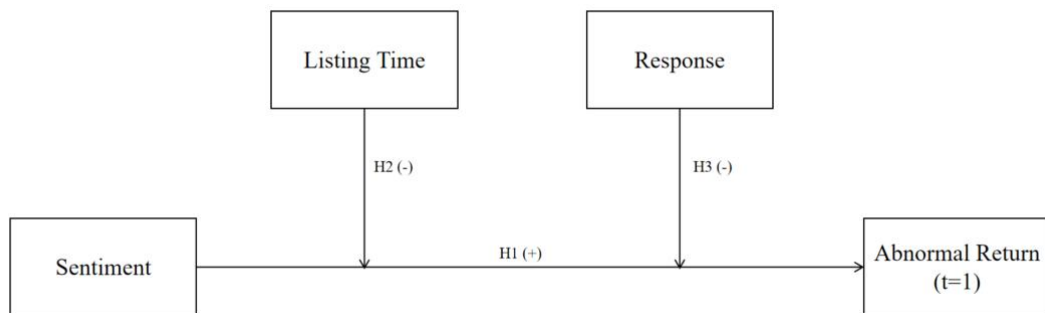


Table 1.

Table 1. Descriptive statistics and correlation matrix of variables.

Variable	Obs	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Abnormal Return (t=1)	2,087	-0.004	0.026	1.000										
2. Sentiment	2,087	-0.084	0.857	0.051**	1.000									
3. Listing Time	2,087	240.838	204.435	0.040*	-0.072***	1.000								
4. Corporate Response	2,087	0.113	0.317	0.004	-0.251***	0.059***	1.000							
5. ROA	2,087	0.060	0.098	0.063***	0.070***	-0.019	-0.032	1.000						
6. State Ownership	2,087	0.632	0.482	-0.007	0.048**	0.087***	-0.019	0.055**	1.000					
7. Firm Age	2,087	23.025	7.003	-0.063***	0.018	0.008	0.004	-0.093***	0.367***	1.000				
8. Firm Size	2,087	24700000000.000	44400000000.000	0.033	-0.050**	0.050**	0.041*	-0.062***	0.091***	-0.094***	1.000			
9. Leverage	2,087	12.064	3.349	-0.030	-0.075***	0.032	-0.001	-0.213***	0.080***	0.132***	0.004	1.000		
10. Net Income	2,087	29200000000.000	57300000000.000	0.045**	-0.050**	0.048**	0.085***	0.233***	0.205***	0.164***	0.445***	0.060***	1.000	
11. RES	2,087	0.056	0.065	0.000	0.054**	-0.038*	-0.045**	0.038*	-0.064***	0.022	-0.240***	-0.086***	-0.269***	1.000

Notes: Standard errors in parentheses.

Sentiment is a categorical variable (-1 = negative, 0 = neutral, 1 = positive). Response is a 0,1 dummy variable (after the trending topic occurred, 1 = firm responded to this event, 0 = firm did not respond to this event). State Ownership is a 0,1 dummy variable (1 = state-owned enterprises, 0 = non state-owned enterprises). Firm Age refers to the number of years since the firm's establishment. Firm Size is measured by the total sales. Leverage is measured as the ratio of debt to equity. RES is the ratio of expenses to sales. Year dummies and industry dummies are not reported because of space limitations.

* p<0.1, ** p<0.05, *** p<0.01

Table 2.

Table 2. Regression analysis results.

Variable	Model 1 Dependent Variable: Abnormal Return (t=1)	Model 2 Dependent Variable: Abnormal Return (t=1)	Model 3 Dependent Variable: Abnormal Return (t=1)	Model 4 Dependent Variable: Abnormal Return (t=1)
Constant	-0.004 (0.004)	-0.006 (0.004)	-0.006 (0.004)	-0.006 (0.004)
ROA	0.024** (0.011)	0.025** (0.011)	0.026** (0.011)	0.024** (0.011)
State Ownership	0.003* (0.002)	0.003* (0.002)	0.003* (0.002)	0.003* (0.002)
Firm Age	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Firm Size	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
Leverage	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Net Income	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
RES	-0.017 (0.014)	-0.016 (0.014)	-0.015 (0.014)	-0.017 (0.014)
Year	Included	Included	Included	Included
Industry	Included	Included	Included	Included
Sentiment		0.002*** (0.001)	0.003*** (0.001)	0.002*** (0.001)
Listing Time		0.000* (0.000)	0.000 (0.000)	0.000* (0.000)
Corporate Response		0.001 (0.002)	0.001 (0.002)	-0.003 (0.002)
Sentiment * Listing Time			-0.000* (0.000)	
Sentiment * Corporate Response				-0.005** (0.003)
Observations	2087	2087	2087	2087
R ²	0.037	0.042	0.044	0.044
Adjusted R ²	0.024	0.027	0.029	0.029

Notes: Standard errors in parentheses. Sentiment is a categorical variable, measured by -1 = negative, 0 = neutral, 1 = positive. Response is a 0,1 dummy variable (after the trending topic occurred, 1 = firm responded to this event, 0 = firm did not respond to this event). State Ownership is a 0,1 dummy variable (1 = state-owned enterprises, 0 = non state-owned enterprises). Firm Age refers to the number of years since the firm's establishment. Firm Size is measured by the total sales. Leverage is measured as the ratio of debt to equity. RES is the ratio of expenses to sales. Year dummies and industry dummies are not reported because of space limitations.

* p<0.1, ** p<0.05, *** p<0.01

Table 3.

Table 3. Robust results.

Variable	Model 1	Model 2	Model 3	Model 4
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	Dependent Variable: Abnormal Return (t=1)	Dependent Variable: Abnormal Return (t=1)	Dependent Variable: Abnormal Return (t=1)	Dependent Variable: Abnormal Return (t=1)
Constant	-0.005 (0.004)	-0.006 (0.004)	-0.007 (0.004)	-0.007 (0.004)
ROA	0.026** (0.011)	0.026** (0.011)	0.027** (0.011)	0.025** (0.011)
State Ownership	0.003** (0.002)	0.003* (0.002)	0.003* (0.002)	0.003* (0.002)
Firm Age	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Firm Size	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000* (0.000)
Leverage	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Net Income	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
RES	-0.015 (0.014)	-0.014 (0.014)	-0.013 (0.014)	-0.015 (0.014)
Year	Included	Included	Included	Included
Industry	Included	Included	Included	Included
Sentiment		0.002*** (0.001)	0.004*** (0.001)	0.002*** (0.001)
Listing Time		0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
Corporate Response		0.001 (0.002)	0.001 (0.002)	-0.003 (0.003)
Sentiment * Listing Time			-0.000* (0.000)	
Sentiment * Corporate Response				-0.005** (0.003)
Observations	2087	2087	2087	2087
R ²	0.035	0.039	0.041	0.041
Adjusted R ²	0.021	0.024	0.026	0.026

Notes: Standard errors in parentheses. Sentiment is a categorical variable, measured by -1 = negative, 0 = neutral, 1 = positive. Response is a 0,1 dummy variable (after the trending topic occurred, 1 = firm responded to this event, 0 = firm did not respond to this event). State Ownership is a 0,1 dummy variable (1 = state-owned enterprises, 0 = non state-owned enterprises). Firm Age refers to the number of years since the firm's establishment. Firm Size is measured by the total sales. Leverage is measured as the ratio of debt to equity. RES is the ratio of expenses to sales. Year dummies and industry dummies are not reported because of space limitations.

* p<0.1, ** p<0.05, *** p<0.01



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MS0063: Enhancement or Inhibition: The Double-Edged Sword Effect of AI Awareness on Employee Innovation Performance

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Enhancement or Inhibition: The Double-Edged Sword Effect of AI Awareness on Employee

Innovation Performance

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Extended Abstract

This study builds a moderating mediator model based on self-determination theory to explore the mechanisms by which artificial intelligence awareness affects employees' innovative performance. The results show that (1) AI awareness promotes employees' innovative performance; (2) AI awareness can act as a catalyst for intrinsic motivation to promote employee innovation performance by stimulating

harmonious work passion, as well as as an extrinsic pressure to inhibit employee innovation performance by stimulating obsessive-compulsive work passion; (3) the innovative atmosphere positively moderates the relationship between AI awareness and harmonious work passion, and moderates the role of AI consciousness in stimulating compulsive work passion.

Keywords: artificial intelligence awareness; harmonious work passion; compulsive work passion; employee innovation performance

1. Introduction

The application of AI in international business (IB) is revolutionizing how companies operate and compete globally. AI awareness among employees influences their innovative performance, which is crucial for maintaining competitive advantages in the global market. Understanding the dual impacts of AI—both enhancing and hindering employee innovation—provides valuable insights for multinational enterprises to optimize their workforce and drive sustainable innovation in an increasingly AI-driven business environment.

2. Literature and Framework

Under the economic situation of globalization and intelligence, the hospitality industry must rely on a continuous innovation drive to survive and develop out of crisis and challenges. While applying AI technology in work scenarios helps employees improve their skills and productivity, employees' career development is still uncertain (Frey & Osborne, 2017a). The perception of employees that AI technology will impact their future careers is referred to as AI awareness, which has a significant impact on employees' psychological state as well as behavioral outcomes (Wang et al., 2022).

On the one hand, AI awareness can bring negative outcomes to employees, such as job insecurity and burnout. For example, Kong et al. (2021) found that AI can bring career uncertainty and insecurity

to employees, causing emotional exhaustion, which triggers employee burnout. On the other hand, AI awareness stimulates positive psychological states and work behaviors in employees. For example, Wang et al. (2022) found that hotel employees faced with the threat of AI technology would take positive actions of active learning and task construction to stimulate creativity further. Therefore, AI awareness can either favorably or unfavorably affect employee behavioral outcomes. Current research has focused on exploring the impact of AI awareness on employee job performance and found a negative correlation and an inverted U-shaped curve relationship. However, little research has been conducted to investigate the impact of AI awareness on employee innovation performance as an important component of assessing employee job performance. Based on the above research gaps, this paper explores the impact of AI awareness on employee innovation performance based on self-determination theory. According to the theory, individual work passion is affected by how individuals internalize their motivation for their work, and the choice of how they internalize their motivation is determined by the perception of external events, which determines the state of passion (Pollack et al., 2020). Finally, by integrating machine learning techniques with regression analysis, this study pioneered combining machine learning with conventional regression methods to explore the complexities of AI awareness and its impact on employee innovation performance. The research demonstrates the complementary insights from these two approaches, highlighting the potential of incorporating cutting-edge data analytics into studying complex organizational phenomena. Consequently, this study paves the way for a more intricate, comprehensive, and accurate understanding of the multifaceted nature of AI awareness and its effects on employee innovation performance. The theoretical model is illustrated in Figure 1. The research hypotheses are as follows:

Hypothesis 1: AI awareness promotes the development of harmonious work passion among employees;

Hypothesis 2: AI awareness positively influences employee innovation performance through harmonious work passion; **Hypothesis 3:** AI awareness promotes the development of obsessive work passion. **Hypothesis 4:** AI awareness negatively impacts employee innovation performance through obsessive work passion; **Hypothesis 5:** Innovation climate positively moderates the relationship between AI awareness and harmonious work passion; **Hypothesis 6:** Innovation climate negatively moderates the relationship between AI awareness and obsessive work passion.

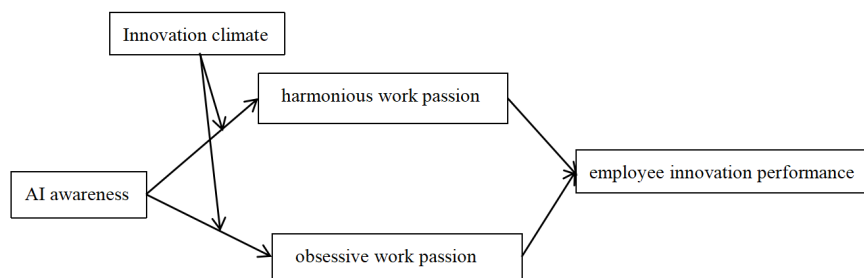


Figure 1. Theoretical model

3. Method and results

By integrating machine learning techniques with regression analysis (based on survey data), this study pioneers combining machine learning with conventional regression methods to explore the complexities of AI awareness and its impact on employee innovation performance. The data collection will be conducted later this year using survey to employees at international companies at the hospitality industry, such as large hotel chains, and travel service companies. By melding machine learning with regression analysis, the research demonstrates the complementary insights that can be garnered from these two approaches, highlighting the potential of incorporating cutting-edge data analytics into studying complex organizational phenomena. Figure 2 illustrates the expected result graphs.

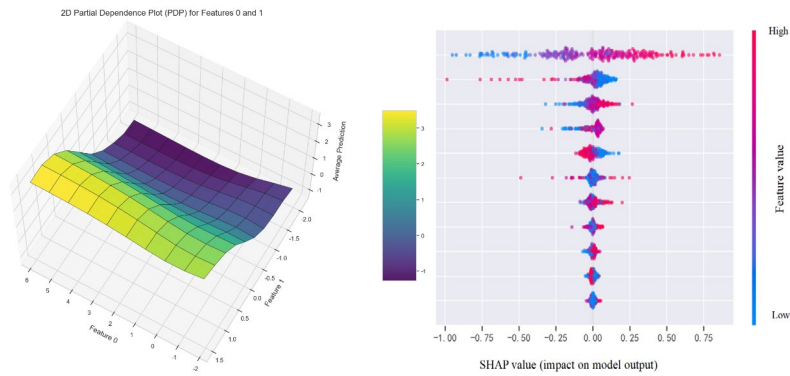


Figure 2. Machine Learning Result Graphs

4. Conclusion

First, this study significantly contributes to the field of International Business (IB) by providing a comprehensive understanding of how AI awareness influences employee innovation performance within a global context. As multinational enterprises increasingly adopt AI technologies, understanding the dual effects of AI on employee behavior is crucial for maintaining competitive advantages in the international market. By integrating Self-Determination Theory (SDT) and advanced machine learning data analytics, this research offers valuable insights for global companies to optimize their workforce, foster a supportive work environment, and drive sustainable innovation. The findings of this study help international business leaders and policymakers design effective strategies to leverage AI technology while mitigating potential drawbacks, ensuring enhanced employee performance and organizational success on a global scale.

Second, this study enriches the research on individual-level impacts of AI awareness in the workplace and expands the investigation into the antecedents of employee innovation performance by examining how AI technology influences employee innovation performance. This contribution is significant as it offers a broader understanding of how AI changes job functions and affects employee innovation performance. By focusing on the dual impact of AI—both enhancing and hindering work passions—this study provides a comprehensive perspective on the complex role AI plays in modern

work environments. Furthermore, it highlights the importance of considering organizational support mechanisms, such as innovation climate, to maximize the benefits of AI while mitigating its potential drawbacks, thus offering practical insights for organizational leaders and policymakers.

Third, this study delves into the underlying mechanisms through which the application of AI awareness affects employee innovation performance, discovering that AI technology influences employee innovation performance through dual work passions, leading to a dual impact. This provides a comprehensive and dialectical research perspective on the effects of AI awareness on employee behavior outcomes. Previous studies have focused on the negative consequences of AI awareness for employees or its positive impacts. However, applying AI technology in the workplace presents opportunities and threats for new employees, resulting in dual effects.

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MS0064: Role of Individuals in Knowledge Transfer across Boundary: Review and a Research Agenda

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Role of Individuals in Knowledge Transfer across Boundary: Review and a Research Agenda

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1. Introduction

Knowledge transfer and learning can enlarge a firm's knowledge base and help it become a stronger competitor in the marketplace. The study of inter-firm collaboration has investigated the connections between firms as an effective mechanism for acquiring external knowledge (Grant & Baden-Fuller, 2004), and the international business field is under systematic development on the knowledge connectivity driven by multinational enterprises (Cano-Kollmann, Cantwell, Hannigan, Mudambi & Song, 2016).

The tendency in earlier research has been to view the connection between firms as a single tie. In contrast, if we take a closer look into the alliance structure, the knowledge transfer between allying firms is actually accelerated by individuals who function as decision-makers or facilitators (Albers, Wohlgezogen & Zajac, 2016). There have been calls for further research on the role of individual-level effects on inter-organization knowledge transfer, but very little research has been invested on the topic of *the roles of individuals regarding knowledge transfer across boundaries?* To answer this research question, this paper focuses on reviewing studies of the roles of individuals and the interactions between them on knowledge transfer, and thus, aims to discuss further research directions of micro-foundation on knowledge transfer across boundaries.

2. Literature and Framework

Transfer of knowledge across boundaries: the role of individuals

Although previous research offers valuable insights into the antecedents of inter-firm knowledge transfer outcomes at the collective level, we can still take one-step forward to bring to light additional endogenous factors that constitute micro-foundations. The organizational analysis should be fundamentally concerned with how individual-level factors aggregate to the collective level (Barney & Felin, 2013). The knowledge transfer between firms, especially some tacit knowledge, which cannot be easily communicated and shared, is highly personal and deeply rooted in action and an individual's involvement within a specific context (Nonaka, 1994). In addition, the relationships between organizations are always mediated by micro links. Direct interpersonal contact between the two key boundary spanners at the partnering firms creates the opportunity for cooperation (Hutt et al., 2000). Therefore, reliable explanations of inter-firm knowledge transfer must involve micro-level constructs, such as individual attitudes, intention, goals, motivation, and behaviors (Foss, Husted & Michailova, 2010).

The question of linking micro factors in learning and knowledge transfer within organizations has been a topic of debate (Burg et al., 2014). However, few researchers have investigated the individual-level effects on inter-organization knowledge transfer (Park & Harris, 2014), even though interpersonal relationship between two organizations is the foundation of knowledge transfer and learning. The personal linkages between locations are usually personal relationships with higher intensity, and they often involve more face-to-face communication and facilitate the building of trust and thereby, transferring knowledge (Lorenzen & Mudambi, 2013). However, microfoundational analysis is not restricted to a concern with the individual in the context of rational choice models; it also includes a general concern with interaction (Foss, 2011). The interpersonal relationship is a critical coordinating part of inter-firm knowledge-sharing situations. The organizations are represented by key individuals who work at the frontline to exchange information and maintain the relationship (Albers et al., 2016). It is those interface employees who work at the fundamental level to coordinate and build trust between organizations.

Interface with high quantity and quality can improve coordination not only in a static sense, such as agreement formulation and activity monitor, but also in a dynamic sense, such as identification and adjustment to changing conditions and uncertainties (Albers et al., 2016). As Von Hippel (1982) and Marsden (1990) argue, the close and intense interaction between individual members effectively transfers and learns sticky and tacit knowledge across an organization's interface. A broader interface with many boundary spanners from different levels and functions can affect alliance learning by building dense and active linkages between them, which help organizations to accumulate knowledge (Albers et al., 2016). However, the close interaction that increases knowledge transparency and openness will bring unintended and unwanted knowledge spillover, which could lead to mutual suspicion of opportunistic behaviors between alliance partners, and they will become less willing to share knowledge (Kale et al., 2000; Qiu and Haugland, 2018, 2019).

Key individuals' personal characteristics

Key individuals in knowledge transfer have several key roles: gathering and transmitting information from the environment to the organization (Leifer & Delbecq, 1978; Leifer & Huber, 1977) and reducing environmental uncertainty (Leifer & Delbecq, 1978; Leifer & Huber, 1977), and communicating across organizational boundaries (Tushman, 1977, Tang, Qiu, and Zhang. 2018, p. 192). Therefore, they are critical to maintaining inter-organization relationships by influencing the trust-building process, organizational behavior, and performance (Seabright, Levinthal & Fichman, 1992; Galaskiewicz & Wasserman, 1989). On the other hand, whether the key individuals have sufficient competence and knowledge, motivation, and power to do so, can be critical for knowledge transfer among organizations (Jackson & King, 1983; Tushman & Scanlan, 1981a, 1981b)

Key individuals' willingness to share their knowledge is found to influence innovation success (Keszey, 2018). Moreover, their personal attachment is related to the process performance in inter-organizational collaboration (Luo, 2001). They can also influence the firm's absorptive capacity depends on their level of embeddedness, empowerment and inter-personal trust in the firm (Ebers &

Maurer, 2014). Moreover, when taking into account the tacitness of knowledge, the boundary spanners' inter-personal trust plays a predominant role (Janowicz-Panjaitan & Noorderhaven, 2009).

Key individuals' personal linkages

Previous literature has studied various antecedents of knowledge transfer and most of them located at the firm-level or dyad-level. This thesis follows the call for a more fundamental study on how individual-level factors aggregate to the collective level in organizational analysis (Barney & Felin, 2013). Knowledge transfer between firms, especially tacit knowledge, is highly personal and deeply rooted in action and an individual's involvement within a specific context (Nonaka, 1994). Moreover, the personal relationship supplies the formal role relationship, and informal psychological contracts substitute for formal legal contracts (Hutt, et al., 2000). *However, we have scant knowledge of how individual-level attributes may influence a knowledge transfer across boundaries.*

Reliable explanations of inter-firm knowledge transfer need to involve micro-level constructs, such as individual attitudes, intentions, goals, motivation, and behaviors (Foss et al., 2010). Over recent years, the impact of knowledge transfer across geographical locations on innovation performance and competitiveness of the firm has gained more and more attention in research (Cano-Kollmann et al., 2016; Lorenzen & Mudambi, 2013). However, *the study about the role of personal linkages on knowledge sourcing across geographical dispersed locations has been often overlooked.* Person-based linkages are characterized by greater intensity as they often involve more face-to-face communication, which is very necessary to transfer the tacit knowledge (Fitjar & Huber, 2014; Lorenzen & Mudambi, 2013).

3. Method and Results

This paper plan to apply systematic literature review to study the role of individuals in knowledge transfer. To address this question, the study will establish inclusion criteria focusing on empirical studies that examine the role of individual actors in knowledge transfer, particularly within

organizational contexts. A comprehensive literature search will be conducted using academic databases such as Web of Science, Scopus, and Google Scholar, with keywords like "knowledge transfer," "individual", "boundary spanners," and "inter-organizational." Titles and abstracts will be screened against the criteria, followed by a full-text review of selected studies to confirm their eligibility. Through thematic analysis, the review will identify and categorize themes related to the role of individuals in knowledge transfer and synthesize the findings to highlight patterns, gaps, and areas for future research.

4. Discussion

There are very few studies investigating the individual-level effects of knowledge transfer empirically, despite the literature on micro-foundations emphasizing the roles of micro-level factors in learning and knowledge transfer within organizations (Burg, et al., 2014; Felin et al., 2012;). This paper aim to address the importance of individuals and their collaboration for knowledge transfer across boundaries, and unlock exactly how individual differences can affect inter-firm learning. Reviewing these two literature trends and studying knowledge transfer, both conceptually and empirically, has yielded some interesting results. First, the motivation to source knowledge, both across organizational and geographical boundaries, is similar, which is to accelerate the firm's information gathering and learning efforts to then help assess the degree of 'causal ambiguity' associated with other firms' skills and capabilities (Barney, 1991; Reed & deFillippi, 1990, Lei, et al., 1996). Second, the efficiency of both types of knowledge transfer is influenced by (1) absorptive capacity and (2) the appropriate processes to make the transfer of knowledge happen, for instance, inter-personal communication. Third, the transfer of knowledge is not easy to achieve. Overall, this dissertation contributes to the research on knowledge transfer through a systematic study of the previous literature on knowledge transfer across boundaries.

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MS0067: Integrating Globalization and Uncertainty in Female Labor Dynamics

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Integrating globalization and uncertainty in female labor dynamics

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Extended Abstract

Investigating the dynamics between globalization, uncertainty, and female unemployment across 23 middle-income trap (MIT) countries, from 1992 to 2021, this paper frames the interplay between female unemployment and the uncertain globalized world economy. Attention to female employment is crucial for sustained economic growth and facilitates transition to high-income status. Utilizing the structural equation modeling technique, this paper segments globalization into six dimensions and deciphers their varied effects on female unemployment. This detailed lens facilitates a refined understanding of how globalization can either bolster or hinder female employment. Results indicate negative influence of globalization on female unemployment, suggesting its contribution to female employment. Concurrently, uncertainty negatively affects globalization and positively affects female unemployment, suggesting uncertainty stalls the process of globalization and disrupts the functioning of female labor markets. This paper emphasizes necessity for strategies safeguarding female employment during uncertainty and fostering conducive environment for female employment in globalization to navigate the challenges of MIT.

Keywords: Female unemployment, globalization, gender inequality, middle-income trap, uncertainty

1. Introduction

The COVID-19 pandemic has precipitated a marked escalation in the female unemployment rate, a

trend that has been pronounced among middle-income trap^a (MIT) economies. In contrast to high-income economies, where female unemployment rates have been on a downward trajectory, MIT economies have witnessed a persistently high rate of female unemployment. This trend is not only a reflection of the precarious state of female labor market participation, but also a significant barrier to the economic growth and sustainable development aspirations of MIT economies. Gender equality in employment is recognized as a robust driver of economic growth (Kabeer & Natali, 2013).

The significance of female employment extends beyond the economic sphere, aligning with the goals of the 2030 Agenda for Sustainable Development, as highlighted in the UN Women Report (2018). Gender inequality exerts an influence on economic growth, both directly and indirectly, through human capital accumulation, family relations, and distortions in the allocation of talent that slow the adoption of technology and productivity (Lagerlöf, 2003; Cuberes & Teignier, 2014). The advent of the COVID-19 pandemic has been accompanied by an increase in uncertainty and female unemployment, juxtaposed against a decline in globalization. Globalization presents a dual-edged sword. It is perceived as a threat to labor markets due to heightened competition and increased capital mobility leading to unemployment in industrialized economies (Rodrik, 1998), while it also generates growth-stimulating effects in developing and transition economies (Gurgul & Lach, 2014). The multifaceted impact of globalization on unemployment, including through trade openness, foreign direct investment, technological change, migration, human capital, and financial development, is well-documented (Ethier, 2005; Felbermayr, Prat & Schmerer, 2011a; Schmerer, 2014; Muysken, Vallizadeh & Ziesemer, 2015; Cairó & Cajner, 2018; Epstein & Finkelstein Shapiro, 2019). Yet, the pandemic has exposed the vulnerability of globalization to uncertainty, which has the potential to incite economic volatility and disruptions that can swiftly cascade through global networks.

Uncertainty, characterized by unpredictable government policies and regulations, erodes employment opportunities by discouraging long-term planning, deterring innovation, and hindering the

^a Middle-income trap (MIT) is a phenomenon termed by Gill et al. (2007) to describe economies struggle with the stagnant growth of GDP per capita after achieving the middle-income status. We adopt the relative MIT measure represented by the catch-up index (CUI) proposed by Woo et al. (2012). According to the World Bank (2013), the middle-income trap threshold is defined as CUI values 4.5% to 45%. CUI is calculated as the GDP per capita in an economy relative to the income of the USA.

implementation of effective policies. Bloom (2009) introduced a methodology for quantifying uncertainty, thereby triggering scholarly interest its effects on macroeconomic issues, including impact on unemployment (Caggiano, Castelnuovo & Groshenny, 2014; Choi & Loungani, 2015; Ghosal & Ye, 2015; Schaal, 2017). The rising economic policy uncertainty influences the decision-making of economic agents (Fang, Gozgor, Lau & Seetaram, 2022), affects globalization measured by volume of trade (Tam, 2018; Novy & Taylor, 2020) and foreign direct investment flows (Wang, Chen & Huang, 2014), and is expected to reduce consumers' and producers' confidence levels and harm the business environment (Fang et al., 2022) and consumers' welfare (Handley & Limão, 2017).

The interplay between globalization, uncertainty and female unemployment is a critical nexus that requires examination, especially for economies endeavoring to transcend the MIT. We isolate the drivers of female unemployment by modeling the annual data on uncertainty and informative globalization indicators with structural equation modelling (SEM). This paper to fills the research gap by assessing the impact of globalization and uncertainty as driving force behind female unemployment from a novel perspective, which diverges from the traditional GDP-centric approach to sustainable development. It aims to provide an inclusive point on promoting sustainable growth and surmounting the MIT. Furthermore, this paper sheds new light on the strategies that MIT economies might adopt from advanced economies to navigate the MIT effectively. Prior studies on female employment and globalization are still inconclusive and raise questions that require further exploration. To the best of our knowledge, this paper is the first to systematically assess the role of globalization and uncertainty for female unemployment in the context of MIT. The results reveal that globalization exerts a significantly negative impact on female unemployment, while uncertainty has a significantly positive impact on female unemployment. Moreover, uncertainty negatively impacts globalization, indicating a complex dynamic where uncertainty can affect female unemployment both directly and indirectly.

2. Literature and framework

The basic theoretical model explaining the impact of globalization on unemployment can be traced back to the Ricardian model on comparative advantage based on technological differences and the Heckscher–Ohlin (H-O) model on comparative advantage based on relative factor endowments. Dutt,

Mitra and Ranjan (2009) provided empirical results from the H-O and Ricardian models: from Ricardian model that trade openness and unemployment are negatively related, and from H-O model that the positive effect of trade openness on unemployment for capital-abundant countries and turns negative for labor-abundant countries. So far, there are no consensus concerning the effect of globalization on unemployment. On the one hand, globalization may intensify unemployment. Helpman and Itskhoki (2010) proposed that unemployment may rise in response to falling labor market frictions and falling trade costs using a two-country and two-sector model of international trade. Increased competition for jobs due to the mobility of people in a globalized context could potentially lead to higher unemployment, as argued by Rodrik (1998b). The negative side of international mobility of labor is also related to brain drain (Docquier & Rapoport, 2012). According to Docquier and Rapoport (2012), globalization exacerbates the scarcity of human capital in regions where it is already limited while augmenting its abundance in regions where it is already abundant. Şener (2001) found that trade liberalization can increase the unemployment rate of unskilled labor, but the effect is ambiguous for the economy-wide unemployment rate. Autor, Dorn and Hanson (2013) demonstrated that imports cause higher unemployment and lower labor force participation. On the other hand, unemployment is likely to be decreasing in globalization (Felbermayr, Prat & Schmerer, 2011b; Awad & Youssof, 2016). Globalization can influence female employment by promoting human capital accumulation and human capital investment (Blanchard & Olney, 2017), as international mobility of labor can facilitate the exchange of expertise and experience and lead to the acquisition of new skills and capacities. As MIT economies are relatively labor-abundant, we hypothesize:

Hypothesis 1. Globalization has a negative effect on female unemployment in MIT economies.

Uncertainty is widely recognized for its detrimental effects on employment levels, as evidenced by empirical studies such as Ghosal and Ye (2015) and Schaal (2017). The recessionary effect of uncertainty is explained by the ‘wait-and-see’ effect, which characterizes decision-making in an uncertain and volatile environment (Bernanke, 1983; Bloom, 2009; Bloom, Floetotto, Jaimovich, Saporta-Eksten & Terry, 2018). This behavior is characterized by a reluctance to make new investments or consumption decisions, thereby contributing to the contraction of economic activity and, consequently, employment levels. Vural-Yavaş (2020) corroborated this view, demonstrating that firms

exhibit increased risk aversion during periods of heightened economic policy uncertainty. Elevated uncertainty can exacerbate the economic recessions by prompting postponement in both financial and consumption decisions (Baker, Bloom & Davis, 2016). Furthermore, Wang, Wang and Zong (2023) found that economic policy uncertainty has a significant positive impact on the gross enrolment rate of higher education. This implies that in the face of pervasive uncertainty, individuals may seek to enhance their human capital through education, possibly as a risk mitigation strategy, which could lead to a temporary withdrawal from the labor force and contribute to higher unemployment rates. Economic uncertainty can also influence personal investment and consumption decisions, prompting consumers to prioritize essential expenditures during periods of economic stress (Bernanke, 1983). This shift in consumption patterns can lead to reduced demand for non-essential goods and services, further exacerbating unemployment levels. We hypothesize:

Hypothesis 2. Uncertainty has a positive effect on female unemployment in MIT economies.

Empirical research, such as Bloom, Bond, and Van Reenen (2007), Haddad, Harrison and Hausman (2010), Gilchrist, Sin and Zakrajšek (2014), and Fernald, Hall, Stock and Watson (2017), have demonstrated that heightened uncertainty can dampen investment dynamics, precipitate the collapse of international trade, exacerbate financial frictions, and prolong the recovery from global recessions. Another strand of literature found empirical evidence on the effect of uncertainty on trade. International trade is volatile in response to economic shocks (Novy & Taylor, 2020). The significance of economic policy uncertainty in China and the USA, particularly the latter, in influencing global trade flows is suggested by Tam (2018). Furthermore, Liesch, Welch, and Buckley (2011) suggested that uncertainty raises with international experience, thereby inhibiting globalization or even inducing deglobalization. Theoretical frameworks elucidating the uncertainty-globalization nexus encompass concepts such as global governance, transaction theory, regulatory capture, risk view, and demand-supply effects. First, Rodrik (1998a) posited that globalization processes necessitate the adoption of larger governance structures to counterbalance economic insecurities and risks. This perspective underscores the need for robust policy institutions to regulate the uncertainties inherent in globalization. Second, the transaction cost theory, as articulated by Williamson (1981), emphasized the role of transaction costs in shaping economic behavior. Elevated uncertainty can escalate transaction costs,

making cross-border operations more challenging and potentially deterring firms from engaging in international activities. Third, the regulatory capture view suggests that powerful interest groups can influence and shape government policies to serve their own interests (Grossmann, 2012). Economic policy uncertainty can create opportunities for rent-seeking behavior (Giertz & Mortenson, 2014), leading to a less transparent and more unpredictable regulatory environment that deters firms from entering or expanding their operations in a foreign country. Then, the risk view, rooted in decision-making under conditions of uncertainty, suggests that economic policy uncertainty heightens perceived risk. Phan, Iyke, Sharma and Affandi (2021) investigated the negative impact of economic policy uncertainty on financial stability. Market volatility and exchange rate fluctuations due to uncertainty can discourage firms from engaging in international economic activities, as they seek a stable and predictable environment. An additional perspective examines the impact of uncertainty on the demand and supply sides. On the demand side, heightened uncertainty can depress product demand. Bloom (2014) suggested that a rise of uncertainty leads consumers to have pessimistic beliefs and increase their precautionary savings. On the supply side, the 'wait-and-see' behavior of firms can lead to the postponement in investment and production decisions. Hassler (1996) found that uncertainty increases the costs of waiting and adjustment. Bloom (2009), echoing Hassler's waiting view, suggested that higher uncertainty causes firms to temporarily pause investment. Overall, the synthesis of theoretical perspectives and empirical evidence underscores the dampening effects of uncertainty on globalization.

Hypothesis 3. Uncertainty has a negative effect on globalization in MIT economies.

3. Methods and results

Structural equation modelling (SEM) technique is performed to assess the extent of relationships among the multilayered, complex latent constructs and test the hypotheses developed. SEM is applied because it is useful with multiple indicators for latent variables (Fu, Lin & Zhang, 2020). Annual data has been used for the period of 1992 - 2021 in this paper to explore the relationship among globalization, uncertainty, and female unemployment. We employ SEM and jointly estimate the following equations:

$$UMPF_{it} = \alpha_0 + \alpha_1 GLO_{it} + \alpha_2 WUI_{it} + \alpha_3 UMPF_{it-1} + \alpha_4 Z_{it} + \varepsilon_{it} \quad (1)$$

$$GLO_{it} = \beta_0 + \beta_1 WUI_{it} + \beta_3 GLO_{it-1} + \beta_4 V_{it} + v_{it} \quad (2)$$

where $UMPF_{it}$ denotes female unemployment rate. The concept of uncertainty in the global context is measured by the world uncertainty index (WUI_{it}), which is derived from the economic policy uncertainty website. Z_{it} and V_{it} denote two sets of control variables. In the first equation, following Dutt et al. (2009) and Caggiano et al. (2014), we control GDP per capita, working-age population, real interest rate and inflation. In the second equation, referring to Tam (2018), Gu, Dong, Sun, and Zhou (2021), and Fang et al. (2022), GDP per capita, age dependency ratio, urban population, institutional quality, real effective exchange rates, and urbanization are controlled. Control variables are collected from the World Development Indicators, except institutional quality from the Worldwide Governance Indicators. ε_{it} and ν_{it} are the idiosyncratic errors. A comprehensive framework of globalization indices encapsulates a multitude of dimensions, each reflecting distinct facets of globalization. GLO_{it} represents six sets of globalization indices: (1) overall KOF globalization; (2) KOF economic, political, and social globalization; (3) KOF de jure and KOF de facto globalization; (4) overall DHL globalization; (5) DHL in-depth and in-breadth globalization; and (6) long-run and short-run globalization.

Table 1 presents the baseline estimation of the SEM models that jointly estimate Eqs. (1) and (2). As shown in Columns (1) and (4), both overall globalization indices are statistically significantly and negatively associated with female unemployment. The substantial magnitude of these coefficients underscores the transformative effect of globalization on female employment. Furthermore, this paper discerns economic and social globalization indices exert a significant negative impact on female unemployment. The significant and negative coefficient on de facto globalization index implies that the actual outcomes of globalization, rather than the policies that shape globalization, is a determinant of female unemployment. Additionally, the in-depth globalization index is found to be significantly negatively linked to female unemployment. This result highlights the positive role of deep global interconnectedness in providing opportunities to female in labor market. Long-run globalization also has a significant negative impact on female unemployment, while the coefficients of short-run globalization are statistically insignificant and negative. The results in Panel A reveal that uncertainty exerts a significant positive effect on female unemployment, suggesting that an increase in world uncertainty is correlated with a corresponding increase in female unemployment. While interpreting the

relationship between uncertainty and globalization, as depicted in Panels B - D, we observe variations in the information content conveyed by the KOF and DHL indices in reflecting the influence of uncertainty. Specifically, uncertainty has a significantly negative impact on globalization as measured by overall, economic, social, de facto, de jure, and in-depth globalization indices. The relationship between uncertainty and globalization, as well as the relationship between globalization and female unemployment, carry the indirect effect of uncertainty on female unemployment.

[Insert Table 1 around here]

4. Discussion

The objective of this paper is to investigate the intricate nexus between uncertainty, globalization and female unemployment in MIT economies. The multifaceted nature of globalization indices has been highlighted as crucial for a comprehensive understanding of their distinct impacts on female in labor markets. The empirical analysis presented in this paper reveals that various dimensions of globalization exert significant negative effects on female unemployment. This finding underscores the potential of globalization as a catalyst for economic development and women's empowerment. However, the positive influence of uncertainty on female unemployment introduces a layer of complexity, indicating that while globalization may offer job opportunities for female, it also brings challenges that necessitate prudent policy intervention. The findings of this paper also suggest that uncertain has a dual effect: a direct positive impact on female unemployment and an indirect influence through its negative impact on globalization. This duality underscores the intricate interplay between globalization and uncertainty, emphasizing the importance of cautious consideration and targeted policies to mitigate potential adverse consequences. This paper indicates that the pursuit of globalization can still yield positive outcomes for female employment, provided that the indirect effects of uncertainty are effectively managed. Concurrently, it calls for vigilance against the adverse effects of uncertainty, advocating for targeted and adaptive policies that maximize the benefits of globalization while mitigating its uncertainty. For MIT economies, the strategic embrace of globalization, coupled with robust policies to manage uncertainty, can pave the way for sustainable development and gender equality in the labor market.

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Table 1

Baseline estimations of structural equation models for MIT economies.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Female unemployment (Dep. Var.)							
D.KOF	-8.149**						
	(3.213)						
D.KOF_EC		-2.626*					
		(1.544)					
D.KOF_PO		-0.830					
		(1.420)					
D.KOF_SO		-6.637**					
		(2.632)					
D.KOF_DF			-5.134*				
			(2.803)				
D.KOF_DJ			-1.777				
			(2.312)				
D.DHL				-9.970**			
				(4.359)			
D.DHL_BD					-3.060		
					(3.704)		
D.DHL_DP					-9.497***		
					(3.658)		
KOF_SR						-0.546	
						(0.363)	
KOF_LR						-1.486***	
						(0.448)	
DHL_SR							-0.803
							(0.620)
DHL_LR							-2.628***
							(0.834)
WUI	0.383*	0.281	0.399*	0.744***	0.710***	0.658***	0.832***
	(0.227)	(0.220)	(0.228)	(0.269)	(0.260)	(0.203)	(0.275)
Panel B: Globalization dimension 1 (Dep. Var.)							
WUI	-0.012***	-0.014**	-0.013***	-0.009***	-0.002	-0.038**	-0.051***
	(0.002)	(0.005)	(0.004)	(0.002)	(0.002)	(0.016)	(0.016)
Panel C: Globalization dimension 2 (Dep. Var.)							
WUI		-0.005	-0.009***		-0.014***	-0.011***	-0.000
		(0.005)	(0.003)		(0.003)	(0.001)	(0.001)
Panel D: Globalization dimension 3 (Dep. Var.)							
WUI		-0.017***					
		(0.003)					
Indirect effect	0.099**	0.154***	0.081***	0.090***	0.134**	0.037***	0.042
Total effect	0.482**	0.434**	0.481**	0.834***	0.844***	0.695***	0.873***
Percentage of direct effect	79.461	64.516	83.160	89.209	84.123	94.676	95.189
R² (Female unemployment)	0.965	0.965	0.965	0.966	0.967	0.966	0.966
R² (Total)	0.968	0.976	0.970	0.968	0.969	1.000	1.000
Obs.	425	425	425	383	383	425	383
No. of economies	23	23	23	21	21	23	21
Controls and constant	Included	Included	Included	Included	Included	Included	Included

Note: In order of globalization dimensions 1 to 3, each column shows the results of seven sets of globalization indices. Column (1): KOF; Column (2): KOF_EC, KOF_PO, and KOF_SO; Column (3): KOF_DF and KOF_DJ; Column (4): DHL; Column (5): DHL_BD and DHL_DP; Column (6): KOF_SR and KOF_LR; and Column (7): DHL_SR and DHL_LR. Clustered robust standard errors at the country level are within parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level respectively.



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MS0068: Does AI Matter to ESG Rating of the Semiconductor Industry

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Does AI Matter to ESG Rating of the Semiconductor Industry?

Introduction

The environmental, social, and governance (ESG) factors play an important role in measuring the future financial performance and social influence of enterprises, as stakeholders increasingly prioritize sustainability, ethical practices, and social influence (Božić, 2023; Li et al., 2021). AI shows significant potential in enhancing organizations' ESG considerations and ratings (Mori, 2023; Holmström, 2022; Bolton et al., 2022; Burnaev et al., 2023; Georgieva, 2022; Macpherson et al., 2021). Businesses are utilizing machine learning, computer vision, and natural language processing to improve departmental operations and enhance corporate performance (Huan et al., 2020; Georgieva, 2022; Alekseeva et al., 2020; Bosse et al., 2023). These technologies are also applied by investment institutions to analyze corporate financial data, evaluate ESG (Environmental, Social, and Governance) performance, and conduct risk assessments, demonstrating substantial potential in the ESG field (Božić, 2023; Bolton et al., 2022; Burnaev et al., 2023; Georgieva, 2022; Macpherson et al., 2021; Mori, 2023; Bala et al., 2015). The remarkable progress in semiconductor technology not only provides a solid foundation for the development of AI but also plays a pivotal role in ESG practices, promoting energy efficiency, carbon reduction, and enhancing the performance of intelligent devices (Luca et al., 2021; Hsieh, 2023; Li, 2023; Egorova et al., 2021).

This study aims to examine the bidirectional causal relationship between AI applications in ESG practices, ESG performance ratings, and corporate market value. It also considers the causal relationships with one-period lagged variables.

Model

Based on the research framework, we employ separate models for ESG, E, S, G, AI, and $\text{Log}(MV)$ as dependent variables, and include firm size and leverage as control variables in our model (Giannopoulos et al., 2022; Naeem et al., 2022). We collected panel data from 176 semiconductor enterprises using the Refinitiv ESG score from Reuters for the years 2018 to 2022.

The following hypotheses are proposed:

Hypothesis 1. AI applications in ESG practices positively influence corporate ESG performance ratings.

$$H1: \text{ESG}_{it} = \beta_0 + \beta_1 \text{AI}_{it-1} + \beta_2 \log(MV_{it}) + \beta_3 \text{LV}_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

$$H1a: E_{it} = \beta_0 + \beta_1 AI_{it-1} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

$$H1b: S_{it} = \beta_0 + \beta_1 AI_{it-1} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

$$H1c: Git = \beta_0 + \beta_1 AI_{it-1} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

Hypothesis 2. ESG performance ratings positively influence AI applications in ESG practices.

$$H2: AI_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

$$H2a: AI_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

$$H2b: AI_{it} = \beta_0 + \beta_1 S_{it} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

$$H2c: AI_{it} = \beta_0 + \beta_1 G_{it} + \beta_2 \log(MV_{it}) + \beta_3 LV_{it} + \beta_4 \log(TA_{it}) + \epsilon_{it}$$

Hypothesis 3. ESG performance ratings positively influence corporate market value.

$$H3: \log(MV_{it}) = \beta_0 + \beta_1 ESG_{it} + \beta_2 LV_{it} + \beta_3 \log(TA_{it}) + \epsilon_{it}$$

$$H3a: \log(MV_{it}) = \beta_0 + \beta_1 E_{it} + \beta_2 LV_{it} + \beta_3 \log(TA_{it}) + \epsilon_{it}$$

$$H3b: \log(MV_{it}) = \beta_0 + \beta_1 S_{it} + \beta_2 LV_{it} + \beta_3 \log(TA_{it}) + \epsilon_{it}$$

$$H3c: \log(MV_{it}) = \beta_0 + \beta_1 G_{it} + \beta_2 LV_{it} + \beta_3 \log(TA_{it}) + \epsilon_{it}$$

Hypothesis 4. Corporate market value positively influences ESG performance ratings.

$$H4: ESG_{it} = \beta_0 + \beta_1 \log(MV_{it}) + \beta_2 \log(TA_{it}) + \beta_3 LV_{it} + \epsilon_{it}$$

$$H4a: E_{it} = \beta_0 + \beta_1 \log(MV_{it}) + \beta_2 \log(TA_{it}) + \beta_3 LV_{it} + \epsilon_{it}$$

$$H4b: S_{it} = \beta_0 + \beta_1 \log(MV_{it}) + \beta_2 \log(TA_{it}) + \beta_3 LV_{it} + \epsilon_{it}$$

$$H4c: G_{it} = \beta_0 + \beta_1 \log(MV_{it}) + \beta_2 \log(TA_{it}) + \beta_3 LV_{it} + \epsilon_{it}$$

Hypothesis 5. Corporate market value positively influences AI applications in ESG practices.

$$H5: AI_{it} = \beta_0 + \beta_1 \log(MV_{it}) + \beta_2 \log(TA_{it}) + \beta_3 LV_{it} + \epsilon_{it}$$

Hypothesis 6. AI applications in ESG practices positively influence corporate market value.

H6: Corporate market value positively influences AI applications in ESG practices.

$$H6: \log(MV_{it}) = \beta_0 + \beta_1 AI_{it} + \beta_2 \log(TA_{it}) + \beta_3 LV_{it} + \epsilon_{it}$$

One-period Lagged (H6 as example, H1~H5 omitted)

$$H6: \log(MV_{it}) = \beta_0 + \beta_1 AI_{it-1} + \beta_2 \log(TA_{it-1}) + \beta_3 LV_{it-1} + \epsilon_{it}$$

Results

The firm's assets during the current period significantly affect AI applications in ESG, E, S, and G practices in the subsequent period. The overall ESG performance indicators—E, S, and G—significantly reach a 1% level of significance. This study confirms that the extensive application of AI technology in semiconductor firms, when applied to ESG practices, not only efficiently analyzes a large amount of ESG data but also identifies potential risks and opportunities (Božić, 2023). This enhances individual ESG performance, including environmental management, social responsibility, and governance levels.

This study also explores the bidirectional relationship between AI applications in ESG and the ESG rating performance and market value of semiconductor companies. The analysis uses the Refinitiv database from Bloomberg, rigorously selecting a sample of 176 global semiconductor companies with continuous data from 2018 to 2022. The key findings are threefold:

1. **Lagged Influence of AI on ESG Performance:** The application of AI in ESG practices by semiconductor companies in the prior year positively affects the overall ESG rating performance, as well as the ratings for Environmental (E), Social (S), and Governance (G) aspects. This aligns with Božić (2023), who suggested the potential for AI to significantly enhance ESG efficiency. It is thus recommended that semiconductor companies increase their AI applications in ESG practices to improve ESG rating performance.
2. **Lagged Market Value Influence on ESG Performance:** The market value of semiconductor companies in the previous year influences the overall ESG rating performance and the ratings for Environmental (E), Social (S), and Governance (G) aspects.
3. **Bidirectional Causality between Market Value and AI Application:** There exists a bidirectional causal relationship between current and previous market values of semiconductor companies and their AI applications in ESG practices. Thus, semiconductor companies are encouraged to increase AI applications in ESG

practices to enhance their market value, which in turn positively influences their ESG rating performance.

Discussion

Egorova, Grishunina, and Karminskya (2022) proposed that as ESG rating performance improves, IT companies can increase their market value. However, our study finds that only the Environmental (E) rating performance positively affects the market value of semiconductor companies, with a significance level of only 10%. No significant influence was found from Social (S) and Governance (G) rating performances on market value. This may be related to semiconductor companies focusing more on environmental sustainability and resource conservation, such as water and electricity. As companies increase their attention to ESG and related data, its influence on market value may become more pronounced in the future.

This study fills the research gap by examining the influence of AI applications in ESG practices on ESG rating performance and market value in the semiconductor industry. The findings and recommendations bear practical significance for both the semiconductor industry and other sectors. The results confirm that AI applications in ESG practices positively influence ESG rating performance in the semiconductor industry and underline the importance of ESG rating performance for market value.

Limitations

1. **Sample Size:** This study focuses only on semiconductor companies with complete ESG rating performance and financial data for four consecutive years (2018-2022). The limited sample size may affect the statistical analysis results. Future research is suggested to collect related data from broader platforms and expand the sample size to ensure data completeness.
2. **Accuracy of AI Application Data:** The collection of AI application data in ESG practices may be affected by corporate confidentiality policies and information transparency, which may not be published in annual or sustainability reports, potentially affecting the accuracy of variable values. Additionally, the study only records binary data (0 or 1) concerning whether AI is applied, lacking records of usage frequency or expenditure amounts, which limits the statistical methods applied. While businesses leverage AI, they must also address challenges related to data quality, bias, transparency, and ethical uncertainties. This will require cross-disciplinary collaboration, clear guidelines, and regulatory frameworks (Božić, 2023; Smokova, 2022; Breeman, 2021; Si). It is suggested that companies enhance the transparency of ESG-related data to improve the accuracy of future research.

3. **Control Variables:** The study collects only total assets and total debt/total assets as control variables, based on Aydogmus et al. (2022). It does not account for R&D expenditure, investments, capital scale, or revenue, which are characteristics of the semiconductor industry. Future research should incorporate these omitted control variables.

The study acknowledges that ESG is an increasingly important topic in the industry. AI is deemed a key tool in achieving ESG goals, offering innovative solutions to complex problems. Companies can evaluate the extent to which they apply AI in ESG practices, including optimizing energy use, reducing emissions, and improving supply chain transparency. Including AI-related expenses in sustainability accounting, such as development and deployment costs of AI systems, as well as data collection and processing costs, will aid companies in understanding AI's influence on ESG and adjusting investment priorities accordingly.

The research framework and empirical results are shown as Figure 1:

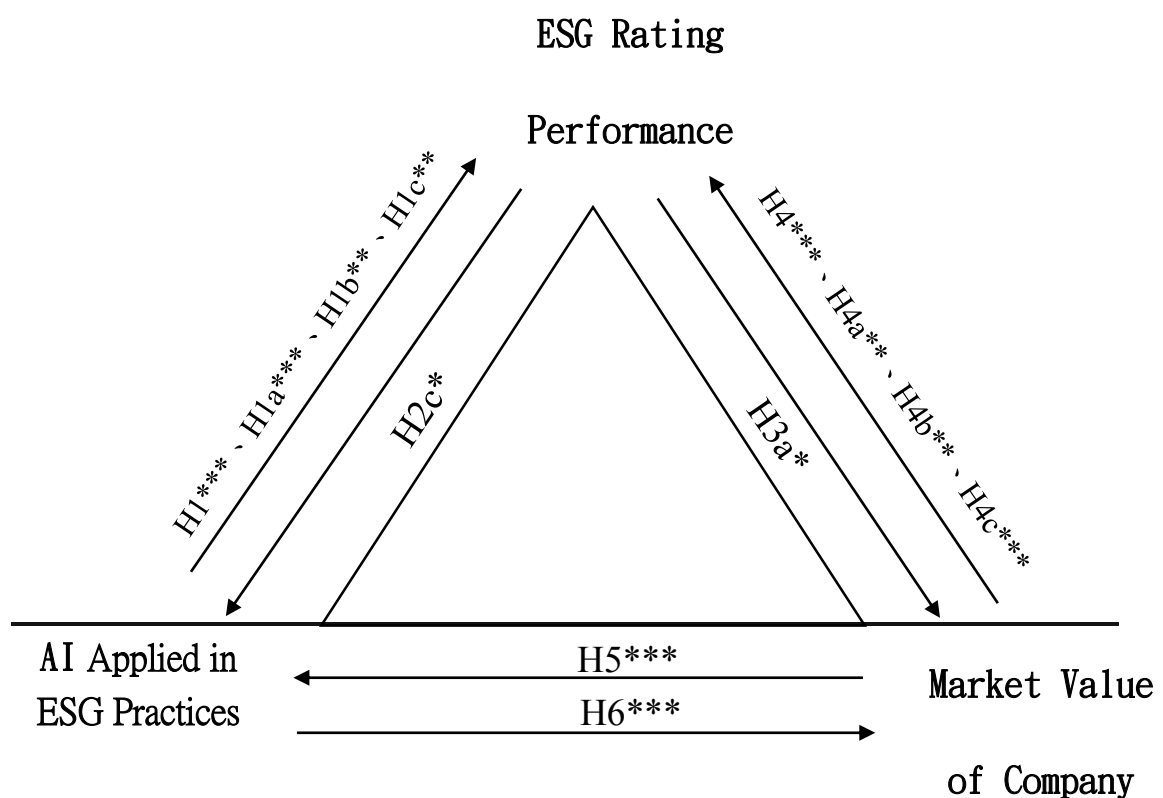


Figure 1: Study Framework and Empirical Results

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MS0071: From Individualism-driven Malicious Envy to Turnover Intention among MZ Generations in South Korea

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**From individualism-driven malicious envy
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From individualism-driven malicious envy to turnover intention among MZ Generations in South Korea

Abstract

This study suggests that the Korean MZ generation, unlike the previous generation that exhibited collectivism, will view team members as targets of competition instead of valuing harmony(和) based on individualism. According to the results of an analysis of 120 MZ employees in Korea, the MZ generation escalated malicious envy into relationship conflict, leading to an increase in turnover intention. Based on the analysis, this study presents managerial implications for reducing turnover intention among the MZ generation in a society transitioning from collectivism to individualism, such as Korea.

Keyword: Malicious Envy, Relationship Conflict, Turnover Intention, MZ Generation, Individualism

1. Introduction

The objective of this study is to examine the mechanisms through which envy and conflict interact in MZ generations in South Korea and to ascertain the impact of this interaction on MZ workers' turnover intention. This study focuses on MZ generations in Korea for the following reasons: First, South Korea is undergoing a rapid transition from a collectivist to an individualistic culture. In light of these findings, the results of this study on Korean MZ generations may have implications for countries undergoing a similar transition. Second, the present study's investigation of the envy and conflict experienced by MZ generations may offer valuable insights for human resource managers.

The present study proposes that individualistic tendencies that prioritize individual achievement, when coupled with the prevalence of team systems and the current era's emphasis on meritocracy, may foster a tendency toward malicious envy directed toward individuals who demonstrate superior performance. In light of these assumptions, our analysis of 120 Korean MZ generations workers indicates that malicious envy is associated with increased turnover intention among MZ generations.

Furthermore, our findings suggest that relationship conflict fully mediates the relationship between malicious envy and turnover intention. However, contrary to expectations, the results indicated that malicious envy does not lead to task conflict among team members in MZ generations. In light of our findings, we propose that the frustration caused by social comparison and the negative emotions it engenders should be proactively addressed, particularly in contexts where societies are undergoing a rapid transition from collectivist to individualistic cultures.

2. Hypotheses

2.1. Two Types of Envy: Benign and Malicious

Envy is defined as "an unpleasant and often painful blend of feelings characterized by inferiority, hostility, and resentment caused by a comparison with a person or group of persons who possess something we desire (Smith & Kim, 2007: 49)." Envy is conceptualized as an emotional response to upward social comparison, as delineated in social comparison theory and equity theory (Sterling, Van de Ven, & Smith, 2016; Van de Ven, Zeelenberg, & Pieters, 2011). These theories posit that social comparison with individuals who are perceived to be superior to oneself (i.e., upward comparison) is inherently accompanied by feelings of frustration (Smith & Kim, 2007).

Prior research indicates that the motivation of self-enhancement manifests as malicious envy, which results in negative behavioral patterns, such as the deliberate undermining of a superior comparison target with the intention of reducing their status to that of the self. In contrast, the motive of self-development is expressed as benign envy, which gives rise to positive behavioral patterns. Tai, Narayanan, & McAllister (2012) argued that envy should be described as a concept that has the potential to lead to both positive and negative outcomes. This potential is dependent on the context and the strength of the disposition expressed. In alignment with the argument put forth by Tai et al. (2012), this study posits that culture serves as a moderating variable capable of influencing the expression of envy.

2.2. South Korea: From collectivism to individualism

Collectivism is "a cluster of attitudes, beliefs, and behaviours toward a wide variety of people (Hofstede, 1980, 2011; Hui & Triandis, 1986)." The extant literature demonstrates that in collectivist societies, the advancement of group goals is prioritized over the pursuit of individual goals or the protection of individual lives. Collectivist societies place a premium on group cohesion and concord, with interpersonal relationships assuming greater importance than task-oriented pursuits. In stark contrast, individualistic societies espouse a value system wherein individual aspirations and autonomy are accorded greater significance than collective goals. Individualistic societies prioritize individual achievement, rights, autonomy, and pleasure, whereas collectivist societies prioritize group cohesion and concord.

It has been consistently contended that Korea is undergoing a transition from a collectivist culture to an individualist culture (Park & Kim, 2018; Han & Shin, 1999; Na & Cha, 1999; Na & Cha, 2010). Combined with the rise of individualism, the demographic homogeneity and high degree of interaction among members in team-based structures makes it imperative to recognize the constraints of limited resources, the intensification of competition, and the propensity for social comparison. In other words, a culture that places a premium on individual achievement, in conjunction with a meritocratic system, fosters social comparison among team members, which can readily devolve into malevolent envy of a superior performer. In a collectivist culture that values harmony, a teammate's superior performance will be perceived as an extension of the collective, whereas in an individualistic culture, it will be perceived as a competitor that needs to be outdone.

2.3. The Impact of Malicious Envy on Conflict and Turnover Intention

Prior research has demonstrated that malicious envy is a significant predictor of turnover intention (Sterling et al., 2016). This can be explained by the fact that the frustration that arises from comparing oneself to a superior counterpart leads to a negative perception of the organization if the comparison is sustained (Tai et al., 2012).

H 1: Turnover intention will increase as malicious envy increases.

Prior research on conflict suggests that conflict is divided into task conflict and relationship conflict (Pinkley, 1990; Jehn, 1995), where task conflict "exists when there are disagreements among group members about the content of the tasks being performed, including differences in viewpoints, ideas, and opinions (Jehn, 1995: 258)", while relationship conflict "exists when there are interpersonal incompatibilities among group members, which typically includes tension, animosity, and annoyance among group members within a group (Jehn, 1995: 258)". Tai et al. (2012) drew on equity theory to explain that when individuals experience upward social comparison and the resulting frustration, they may reduce their own work productivity in order to improve their input-output ratio to a level similar to that of a superior team member.

If an individual experiences malicious envy and perceives that they are being treated unfairly by the organization as a result, it is reasonable to posit that the individual will exert less effort in their task, which may then give rise to conflict with others working on the task alongside them. In contrast, with regard to non-task personal relationships, an individual experiencing malicious envy may endeavor to engage in behaviors that are intended to impede the capacity of others to establish and maintain positive interpersonal relationships, work-related successes, and favorable reputations (social undermining; Duffy, Ganster, & Pagon, 2002: 333). Furthermore, when social undermining is attempted, the individual can be expected to experience conflict in their relationships with team members who are targets of malicious envy.

H 2a: As malicious envy increases, task conflict will increase among team members.

H 2b: As malicious envy increases, relationship conflict will increase among team members.

Prior research on conflict indicates that conflict is a significant predictor of turnover intentions. First, team members experiencing task conflict are likely to consider leaving due to poor performance and the resulting negative reputation, as well as the transition to relationship conflict that they experience as the task conflict persists (cf. Jehn, Chadwick, & Thatcher, 1997; De Dreu & Weingart, 2003). Similarly, team members experiencing relationship conflict can be expected to contemplate turnover as they become disengaged from their work and performance, and experience conflict-induced anxiety and tension (Pelled, 1996; Jehn & Bendersky, 2003).

H 3a: Turnover intention will increase as task conflict increases among team members.

H 3b: Turnover intention will increase as relationship conflict increases among team members.

H 4a: Task conflict among team members will mediate malicious envy and turnover intention.

H 4b: Relationship conflict between team members will mediate malicious envy and turnover intention.

3. Methods

This study surveyed MZ generations in Korea, and the number of valid responses, excluding missing values, was 120. The respondents belonged to the MZ generations (cf. Millennial generation: born in 1982 or later (Strauss & Howe, 1991), Z generation: born in 1995 or later (Berkup, 2014), and they are currently employed in a team-based organization. To assess malicious envy, we employed the four 7-point Likert scale items developed by Sterling et al. (2014), the six 5-point Likert scale items proposed by Pearson, Ensley, and Amason (2002; three for task conflict and three for relationship conflict), which were adapted from Jehn's (1995) items, and the four 5-point Likert scale items proposed by Kelloway, Gottlieb, and Barham (1999) to measure turnover intention. The analysis included the control variables of gender, marital status, tenure, job function, and firm size.

Prior to testing the hypotheses, a confirmatory factor analysis was conducted using AMOS 22 to ensure the instrument's validity. All measures of the variables included in the research model demonstrated factor loadings of .50 or higher (Hair, Rolph, Ronld, & Williams, 2006). Subsequently, the analytical model of this study demonstrated a moderate level of fit ($\chi^2(48)=63.345$, $p<.1$, RMSEA=.052, RMR=.063, GFI=.924, CFI=.983, RFI=.908, AGFI=.876), and the composite reliability of the measurement instrument exceeded .70 for all variables, with the average variance extracted exceeding .50. Finally, the discriminant validity was also verified by comparing the squared value of the correlation coefficient between the two concepts and the average variance extracted for each variable.

The results of hypothesis testing using hierarchical regression analysis using SPSS 22 are shown in Table 1 and Table 2 (cf. Baron & Kenny, 1986). The results of the analysis showed that hypotheses 1 ($\beta=.195$, $p<.05$), 2b ($\beta=.156$), 3a ($\beta=.407$ $p<.001$), 3b ($\beta=.182$, $p<.1$), and 4b ($\beta=.195$, $p<.05$) were

supported, and hypotheses 2a and 4a were rejected. Bootstrapping analysis for mediating effects revealed that the total effect of malicious envy on turnover intention was significant ($\beta=.213, p<.05$), but the direct effect of malicious envy on turnover intention was not significant ($\beta=.147$). The indirect effect of malicious envy on turnover intention mediated by relationship conflict is significant as the values of Boot LLCL (.0094) and Boot ULCL (.1462) do not contain zero.

Table 1. The Mediating Effect of Task Conflict on Intention to Leave

	Task Conflict		Intention to Leave					
	M1	M2	M3	M4	M5			
	<i>std. β</i>	<i>t</i>	<i>std. β</i>	<i>t</i>	<i>std. β</i>	<i>t</i>		
Malicious Envy			.156	1.583	.195	2.015*	.132	1.470
Task Conflict							.407	4.824**
adj. R²	0.001	0.014	.027	.053	.209			
F	1.019	1.277	1.666	2.102 [†]	5.481**			

N=120, [†] $p<.1$, * $p<.05$, ** $p<.01$

Note: The results of the exploratory factor analysis were employed in the analysis. In light of the aforementioned space limitations, the results of control variables are not printed here.

Table 2. The Mediating Effect of Relationship Conflict on Intention to Leave

	Relationship Conflict		Intention to Leave					
	M1	M2	M3	M4	M5			
	<i>std. β</i>	<i>t</i>	<i>std. β</i>	<i>t</i>	<i>std. β</i>	<i>t</i>		
Malicious Envy			.288	3.023**	.195	2.015*	.143	1.435
Relationship Conflict							.182	1.922 [†]
adj. R²	0.018	0.083	.027	.053	.075			
F	1.437	2.807*	1.666	2.102 [†]	2.372*			

N=120, [†] $p<.1$, * $p<.05$, ** $p<.01$

Note: The results of the exploratory factor analysis were employed in the analysis. In light of the aforementioned space limitations, the results of control variables are not printed here.

4. Discussion

These findings may be interpreted in two ways. First, in light of the relationship conflict findings,

it is plausible that rather than reducing their own input and only lowering their own performance, which would maintain a competitive disadvantage, MZ generation is taking an active approach to undermining others while maintaining their own performance. Secondly, it is possible that MZ generation is solely focused on performing their own task, regardless of whether other members increase or decrease their level of commitment to the task. Consequently, they may not experience distress if other colleagues reduce their level of commitment. Therefore, this does not result in task conflict.

This study suggests that managers should exercise caution to prevent social comparison and the resulting frustration that inevitably arises in team-based structures from escalating into destructive behaviors such as social undermining. It would be prudent to refrain from employing comparison-based language when evaluating performance, and to separate team members who are already engaged in social comparison into different work areas. In contrast to task-related disagreements, which are relatively straightforward to identify, relationship conflicts are more subjective and difficult to discern. Consequently, it is imperative for managers to exercise greater vigilance and oversight in addressing these issues.

Furthermore, the study indicates that managers should consider the individualistic tendencies of MZ generation with greater seriousness. As previously stated, the potential for other members to disregard their tasks is not a concern for MZ generation, as malicious envy does not manifest as task conflicts. If this reasoning is a valid explanation for the phenomenon, it could result in a situation where, as the proportion of MZs in an organization increases, the team structure is unable to fulfill its original purpose of encouraging team members to interact and collaborate in order to improve performance.

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MS0073: The Effect of Shared IPO Auditor with Listed Affiliates on IPO Audit Quality and IPO Underpricing: Evidence from Audit Firm and Partner Levels

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The effect of shared IPO auditor with listed affiliates on IPO audit quality and IPO underpricing: Evidence from audit firm and partner levels.

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Extended Abstract

This study investigates the effects of sharing an initial public offering (IPO) auditor with listed affiliates on IPO audit quality and IPO underpricing. Using a sample of Chinese A-share IPOs from 2001 to 2021, we examine the trade-off between knowledge spillover and economic dependence when IPO firms share auditors with affiliates within a business group. Our findings reveal that sharing an audit firm with listed affiliates has a significant negative effect on IPO audit quality, measured by discretionary accruals. This negative effect is more pronounced when both the audit firm and partner are shared. Furthermore, IPO firms sharing auditors with listed affiliates experience higher underpricing. We also find that the negative impact on audit quality extends to listed firms sharing the auditors with IPO affiliates. Additional analyses show that IPO firms sharing auditors with listed affiliates face a higher likelihood of rejection during the IPO screening process and experience lower post-IPO financial performance. Our results suggest that the economic dependence effect outweighs the potential benefits of knowledge spillover in the context of common

auditors in IPOs. These findings have important implications for regulators, policymakers, and audit firms, highlighting the need for stricter oversight of auditors serving interconnected group clients during the IPO process to safeguard their independence.

Keywords: common auditor; IPO audit quality; audit partner; real activities manipulation (RAM)

INTRODUCTION

Becoming publicly listed offers numerous benefits for a business group, such as increasing financial capacity, bargaining power, reputation, and attracting investors. Controlling shareholders and their appointed managers of group affiliated IPO firms are motivated to overstate earnings in the IPO application for at least two main reasons. First, for privately-owned business groups, the controlling shareholders' wealth is tied to the firm's equity, which is valued based on the IPO offering price, determined by the CSRC using reported earnings per share (EPS) from the year before the IPO (Chen, Bin, Wu, and Yang 2018). This creates an incentive to inflate earnings to boost the IPO price and proceeds, avoiding undervaluation. In state-owned groups, top managers, often government-appointed, may have less direct economic motivation but seek to enhance earnings to advance their careers (Fan, Wong, and Zhang 2007). Second, the literature indicates that controlling insiders exploit complex ownership structures and opaque transactions for private benefits, especially in weaker institutional environments. The listed affiliates gain access to more investment opportunities and market resources, such as loans and licenses. These expanded opportunities, in turn, provide controllers with more channels to extract personal benefits. (La Porta, Lopez-de-Silanes, and Shleifer 1999). Thus, insiders are highly motivated to list affiliated firms on the capital market.

Controllers of a business group may prefer to appoint a common auditor for affiliated IPO firms for several strategic reasons, but this practice has both advantages and potential drawbacks. On the positive side, a common auditor develops a deep understanding of the group's complex structures and transactions, streamlining the audit process and potentially helping to control sensitive information leakage during the IPO period (Yang, Kang, Lin, and Ronen 2016). However, this

familiarity may also lead to reduced scrutiny of intra-group transactions, potentially enabling tunneling or other forms of expropriation. In some cases, a common auditor might even provide more flexibility in managing earnings to present the most favorable picture for the IPO (Sun, Wang, Wang, and Qi 2020). While the unique nature of IPO audits makes sharing an IPO auditor with listed affiliates appealing to business groups, its impact on IPO audit quality and IPO underpricing remains unexplored (Sun, Wang, Wang, and Qi 2020).

In this study, we examine three specific questions using a sample of Chinese A-share IPOs from 2001 to 2021. Our primary focus is to investigate whether sharing auditors with listed affiliates impairs IPO audit quality. According to the knowledge spillover effect, auditors working with multiple entities within a business group gain an in-depth understanding of the group's overall structure, business model, and internal controls (Seavey, Imhof, and Westfall 2018). Repeated exposure to similar businesses enhances the auditor's industry-specific knowledge, potentially leading to more effective risk assessment and audit procedures (Sun et al. 2020). These factors could contribute to higher quality IPO audits. In contrast, economic dependence theory argues auditor independence may be compromised when serving multiple entities within a business group. The heightened economic dependence creates pressure on the auditor to maintain the overall client relationship, potentially making them less willing to challenge management or report issues. The auditor's reluctance stems from the fear of losing not just one engagement, but multiple related ones within the group. Consequently, this interdependence between the auditor and the business group can create a conflict of interest, potentially affecting the auditor's objectivity and professional skepticism, and ultimately leading to lower audit quality (Chen et al. 2016; Sun et al. 2020). Our findings reveal that sharing the audit firm with listed affiliates has a significant negative effect on the IPO firm's audit quality, measured by discretionary accruals. In addition to the audit firm level, we also investigate the effect of sharing the IPO audit partner with affiliates on IPO audit quality. Research demonstrates that individual auditor characteristics significantly impact audit quality (Lennox and Wu 2018; Hanlon et al. 2012). The experience of audit partners could directly amplify the knowledge spillover effect. Conversely, economic dependence on client networks can negatively

affect the audit quality of audit partners (Chen et al 2010; Chen et al 2016). This raises the question: which effect dominates the decision-making process of a common audit partner? Our findings shed light on this issue. We observe an incremental negative effect on IPO audit quality when the IPO firms share not only the audit firm but also the audit partner with its listed affiliates. These results support that the economic significance of important clients, i.e., business groups, outweighs the potential benefits of knowledge spillover in the context of common auditors in IPOs. This suggests that the pressure to retain significant clients may compromise auditor independence and, consequently, audit quality.

Second, we investigate the impact of sharing an IPO auditor with affiliates on IPO underpricing, which is an important area of research as it connects auditor choice with IPO outcomes, potentially influencing both company strategies and investor decisions. The knowledge spillover effect could contribute to higher quality audits, thereby reducing information asymmetry and potentially leading to lower IPO underpricing. Conversely, the economic dependence posits that shared auditors might compromise their independence due to the importance of the client group, resulting in lower audit quality. This, in turn, could increase information asymmetry and lead to higher IPO underpricing. We find that IPO firms sharing an audit firm with listed affiliates have higher underpricing compared to their counterparts. Moreover, IPO firms audited by the same partner as their affiliates exhibit even greater underpricing than those audited by different partners. The observed higher underpricing among firms with common auditors, particularly at the partner level, indicates that the market perceives common IPO auditors as a risk factor rather than a quality signal.

To provide a more comprehensive view of the implications of shared auditors within business groups, our third question shifts from examining the IPO firms to investigating the impact on the already listed affiliates when they share auditors with IPO affiliates. We adopt a difference-in-differences (DID) research design and construct a propensity score matching (PSM) sample by matching each listed firm that shares auditors with IPO affiliates to similar listed firms that do not. We find that sharing auditors with IPO affiliates impairs listed firms' audit quality. The negative

impact of the common IPO auditors on audit quality isn't confined to the IPO firms but extends to other listed affiliates, suggesting that the compromise in auditor independence affects the entire client group.

In additional analyses, we demonstrate that IPO firms sharing auditors with listed affiliates face a higher likelihood of rejection by the CSRC during the IPO screening process. The top 10 largest audit firms and the political connection of IPO firms can mitigate the negative effects of common IPO auditors on IPO audit quality and underpricing. Furthermore, our results indicate that sharing IPO audit firms and partners with listed affiliates is associated with lower post-IPO financial performance. Finally, utilizing a DID research design, we observe that listed firms sharing auditors with IPO affiliates experience a decrease in audit fees in the post-sharing period.

Our study extends prior research and contributes to the literature in several ways. Primarily, our findings contribute to the business group literature by examining the trade-off between knowledge spillover and economic dependence when affiliated firms within a business group share auditors, specifically in the high-risk context of IPO engagements. The unique setting of IPO may amplify or constrain these competing dynamics. The economic dependence effect could be aggravated during IPOs due to controlling insiders' strong motivations to manipulate pre-IPO earnings. However, heightened regulatory scrutiny may temper this effect. Conversely, limited financial disclosure among private group firms suggests knowledge spillover may be more impactful for IPO engagements relative to annual audits. Our findings indicate that for IPO engagements, the economic bonding between IPO auditors and their group clients outweighs potential knowledge gains. This has significant implications for regulators and policymakers, given the prevalence of business groups undertaking IPOs in emerging economies. Our evidence suggests the need for stricter oversight of auditors serving interconnected group clients during the IPO process to safeguard their independence. The dominance of economic bonding also underscores the need for auditors to exercise caution when taking on multiple clients within the same business group. This study deepens our understanding of how business group structures and incentives surrounding high-stakes IPOs shape auditor independence, a crucial factor for governance and information quality.

Second, our study contributes to the IPO underpricing literature. Previous research has explored whether Big N auditors and auditors with IPO audit specialization serve as quality signals to IPO investors, potentially reducing issuer underpricing (Beatty 1989; Park and Massel 2022). We extend the IPO underpricing literature by examining the role of common auditors within the framework of signaling theory. Specifically, we show that sharing auditors with listed affiliates appears to increase IPO underpricing, possibly due to perceived risks associated with auditor independence or resource allocation. This research thus broadens our understanding of how various auditor characteristics can serve as signals in the IPO market.

We further contribute to the research on how shared auditors, particularly at the partner level, can influence audit outcomes in group structures. This approach complements existing archival audit quality research, which is predominantly focused on firm-level analyses, and responds to calls for evidence at the individual auditor level (DeFond and Zhang 2014; Lennox and Wu 2018). Our results reveal that sharing audit partners has an incremental adverse association with IPO audit quality and IPO underpricing, beyond the effects of common audit firms. This suggests auditor incentives at the individual level play a pivotal role in determining audit quality for interconnected clients. It also highlights the importance of distinguishing between individual partner and firm-wide factors when examining issues of auditor independence and objectivity. From a practical perspective, our evidence on the significance of individual partners has important implications for regulators and audit firms. Regulators aiming to safeguard reporting credibility for group-affiliated IPOs should emphasize requirements and reviews of engagement partners. Similarly, audit firms can implement enhanced oversight for partners involved in potentially compromising joint engagements across affiliated group clients.

Our study also contributes to the literature on audit resource allocation. High-quality audits result from auditors dedicating substantial resources to the project, including skilled auditors, sufficient time for planning and testing, comprehensive communication with stakeholders, and quality control and review (DeFond and Zhang 2014). Our DID analysis suggests that affiliated IPO engagements divert resources from annual audits, leading to reduced audit quality for listed affiliates.

Furthermore, we find evidence that after sharing auditors with IPO affiliates, listed affiliates are charged lower audit fees, which supports that common auditors provide a lower level of annual auditing service to these listed firms (Copley and Douthett 2009). These findings extend our understanding of how resource allocation decisions by audit firms can have far-reaching effects on audit quality across their client portfolio. Our results highlight the potential unintended consequences of auditor sharing within business groups, particularly during resource-intensive events like IPOs.

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MS0074: Trends and Models of Coping Strategies for Successful Entrepreneurs in the Face of Adversities: A Bibliometric Literature Review

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Trends and models of coping strategies for successful entrepreneurs in the face of adversities: a bibliometric literature review

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Extended Abstract

The issue of how entrepreneurs cope with adversity remains a common concern, with scholars emphasizing the study of entrepreneurial coping strategies (ECS). To stay abreast of the constantly evolving field of ECS, there is a need to identify relevant themes and gaps that require further exploration in this domain. This paper aims to review the existing literature on ECS through bibliometric analysis, utilizing the visualization tool VOSviewer and the Bibliometrix R package. By presenting an analysis of the literature from 1992 to 2023, this paper reveals the contributions of research constituents, intellectual interactions, and structural connections in the ECS field. Next, the analysis of keywords uncovers well-established subfields and emerging trajectories. Finally, implications and further research directions are proposed, providing insights for other scholars in the field.

Keyword: Entrepreneurial coping strategies, Resilience, Bibliometric analysis, Performance analysis,

Science mapping

1. Introduction

After creating a venture, entrepreneurs bear the responsibility for its performance [1]. Entrepreneurs encounter various uncertainties and challenges in their routine work [2], which can profoundly affect their mental health, overall well-being, and ultimately entrepreneurial performance. Given the inherent uncertainty in entrepreneurial activities, business failures are frequent. Consequently, entrepreneurial coping strategies (ECS) as a topic has consistently garnered significant scholarly interest. Bruno, et al. [3], in the early research on failure in ECS, contended that beyond financial factors, legal, relational, and personal factors also significantly contribute to critical crises during adversity. The perspective has influenced subsequent research on entrepreneurial learning [4], opportunity identification and utilization [5], and entrepreneurial identity reconstruction [6]. Entrepreneurial uncertainty is a practical issue that can be recognized and addressed by implementing specific strategies [7]. Strategies embodied in learning-from-failure enable individuals to gain valuable experience, managing the uncertainties and pressures inherent in the entrepreneurial journey. For example, Jenkins, et al. [8] proposed that entrepreneurs with prior failure experiences may build psychological capital, allowing them to handle subsequent adversities and challenges successfully. Besides, experiencing failure also provides learning opportunities for entrepreneurs in future endeavors [9]. Experienced individuals adeptly select coping strategies, whether active or avoidance, tailored to the situation, effectively managing uncertainty and preserving their well-being [10]. Significantly, diverse contextual conditions, including market conditions [11], resource availability [12], social support networks [13], cultural contexts [14], and regulatory environments [15], are pivotal in shaping entrepreneurs' coping strategies and performance outcomes.

Given the rapid growth of the ECS field, reviewing relevant literature is essential in its developmental stages [16] to understand the evolution and identify areas requiring further research. This study utilized bibliometric analysis to map the intellectual structure of the ECS domain in the existing literature and

to unpack the evolutionary nuances of this field. Overall, this study examines the ECS literature and addresses three main questions: 1) How has this research domain evolved over time? 2) What are the key areas of focus? 3) Which themes require further research?

2. Procedure

Literature review is pivotal in clarifying the development of a research field and identifying gaps in knowledge [17]. This study employed the PRISMA framework to retrieve relevant literature for an extensive analysis of the ECS domain. Compared to systematic reviews, this method is less time-consuming and manual [18]. Additionally, we followed the bibliometric analysis procedure [19] to present the research findings. PRISMA ensures review transparency and thoroughness with a flowchart checklist [20], while bibliometrics analyses scientific data in an objective quantitative way, including publications, keywords, authors, journals, and other relevant items [19, 21]. Moreover, bibliometric analysis discerns nuanced developments and trends within a field by reporting the performance of research constituents, the bibliometric structure, and the intellectual structure through performance analysis and scientific mapping [19]. Thus, we conducted this integrated analytical procedure to thoroughly cover the ECS literature and analyse scientific data to explore present and future research trends.

The data used in this study are derived from the WoS database. This review focuses exclusively on high-ranked and esteemed entrepreneurship journals, as well as some influential management journals that not only publish articles related to ECS but also shape the direction of the ECS domain. According to this criterion, a total of 367,983 journal articles were retrieved, which were published between 1992 and 2023. To establish the boundaries of this research, the widely accepted definition of entrepreneurial action was adopted to define the scope of the dataset utilized in this study, which refers to the process of recognizing and exploiting opportunities to create value [22-24]. Furthermore, this study emphasizes individual-level empirical research to identify existing knowledge and gaps in the ECS field, rather than focusing on organizational or supply chain level. Upon manually reviewing abstracts and excluding

those not fitting the criteria, we compiled a final dataset of 212 articles.

Based on the 212-article dataset, we conducted performance analysis and science mapping. Performance analysis quantifies the contributions of research constituents, whereas scientific mapping elucidates their interrelations [19]. Moreover, science mapping presents a field's bibliometric and knowledge structures [25], using co-citation analysis, co-occurrence analysis, and co-author analysis techniques. This study employed co-citation analysis and co-occurrence analysis to extract the core concepts of the ECS field. Co-citation analysis targets highly-cited publications to identify foundational publications [19], while co-occurrence analysis identifies the predominant topics by examining the frequency of entities appearing together in a set of units [17]. In addition, network visualization tools from VOSviewer and the Bibliometrix R package are further utilized to enrich the outcomes of the bibliometric analysis.

3. Results

The performance analysis indicates consistent annual publication growth from 2008, with a notable surge since 2019. *Journal of Business Venturing*, the most influential journal in this domain, features several highly cited articles. One example is “Cognitive biases, risk perception, and venture formation” by Simon, et al. [26], receiving 617 citations. Some certain metrics, such as the CPP, are essential for assessing the influence of journals. According to this metric, *Journal of Management* and *Academy of Management Journal* are the most influential journals among the 14 journals. Dean A. Shepherd ranks among the most influential ECS authors, with 9 articles and 899 citations.

Science Mapping's co-citation and co-occurrence techniques streamlined the scrutiny of 13,352 references across 212 articles, uncovering the groundwork, author connections, and prevailing ideas. “Learning from Business Failure” by Shepherd [27] has emerged as a prominent ESC reference, proposing the benefits of failure on entrepreneurial growth, and elucidating a balance of healthy adaptation between coping with grief and practical adjustment. “Common method biases in behavioral research” [28] stands out as a pivotal ECS contribution, providing strategies to reduce response biases

through drawing upon multiple-source data, multi-method measurements, and multi-temporal measurements.

The co-citation analysis identified Shepherd [27], Cope [29], Shane and Venkataraman [30] and Bullough, et al. [31] as central contributors in shaping the key themes within the ECS literature. Entrepreneurial failure, despite its negative consequences, provides constructive feedback and learning opportunities contributing to future venture success [27, 29]. The focus on entrepreneurial resilience and self-efficacy in high-risk contexts [31] has prompted studies on individual traits that enhance entrepreneurial performance in adversities, sparking interest in the theme of “Entrepreneurs’ Performance Determinants”.

Employing thematic visualization, the study maps the distribution and trends in ECS themes. Building upon the foundational concepts of entrepreneurship [30] and entrepreneurial failure [3], researchers have explored failure learning [27, 29], crisis management [32, 33], and coping resources [4, 34], investigating specific coping strategies. The resilience theme is foundational in the field, as also evidenced by its frequent pairing in the co-occurrence analysis of terms. The idea that entrepreneurs can develop resilience by building social networks, seeking advice from mentors, and learning from past experiences has been recognized by later scholars [35-37]. Additionally, self-efficacy has been intensively studied as a motor ECS theme. Researchers investigated the impact of self-efficacy on entrepreneurial performance [31], its correlation with stress and subjective well-being [38], and its establishment [6]. Yet, diverse self-efficacy levels cause individuals to assess gains and losses uniquely, prompting entrepreneurial perseverance despite risks and previous failures [39]. This has partly contributed to the themes of innovation and risky decision-making, especially in the context of SMEs adversities. Resilience and innovation are pivotal in overcoming SMEs’ challenges [40]. Nevertheless, additional research is required to analyse strategies for shaping resilience and enhancing innovation in adversity, while also confirming their applicability across diverse contexts.

Overall, ECS research has witnessed growing intellectual interactions and a rise in “insider” works. The

visualization results highlight predominant research hotspots revolve around “entrepreneurial failure”, “self-efficacy” and “resilience”, with “resilience”, “crisis”, and “learning” emerging as the frontiers. However, due to unstable and intricate contexts and vulnerable entrepreneurial cohorts, there is still plenty of room for further research.

4. Discussion

Synthesizing emerging and future themes in the literature, two key areas were identified that warrant comprehensive exploration: a) adaptive adversity management, and b) adversity coping resources.

First, the process of managing an adversity requires deconstruction, encompassing emotional reactions, as well as decision-making and action responses. Adaptive adversity management refers to an entrepreneur’s ability to cope with and overcome the challenges and uncertainties encountered throughout an entrepreneurial process [41]. Previous studies have explored adaptive adversity management from various perspectives, including emotion, cognition, motivation, and experience. These discussions reveal that emotion regulation can facilitate effective subsequent decision-making and action response, such as assessing potential threats and developing resilience. Segmenting the adversity response process into the phases of reaction and response may allow for improved emotional control and the conscious formulation of a more efficient action mechanism. Thus, we propose the following directions for the area of adaptive adversity management:

(1) Future research could revolve around adaptive coping patterns. Dealing with challenging situations can lead to the development of various coping mechanisms, such as emotional or behavioral strategies, depending on the specific stage of adversity. Notably, the process of overcoming adversity is not a simple linear path, but rather a continuous cycle. It is valuable to explore how entrepreneurs use different modes of thinking to cope with challenging and uncertain situations considering a multi-stage and multi-faceted perspective.

(2) In addition, further insight into the factors driving entrepreneurial resilience amidst challenges is essential. Prior research has revealed the importance of resilience in SME survival and success, particularly in developing economies and disaster-prone regions. Building upon prior discussions, ECS studies have explored cognitive, motivational, and experiential drivers influencing individual engagement in entrepreneurial activities and creativity. Nevertheless, the factors driving entrepreneurial resilience remain largely unexplored and may vary depending on the context and entrepreneurial characteristics.

Second, there is a need to construct “safety nets” of adversity coping resources to mitigate uncertainties. “Resources” are a prominent and recurring theme throughout entrepreneurship literature, exerting significant influence on entrepreneurs’ actions and outcomes [42]. In challenging circumstances, individuals typically rely on their experiences [43], social networks [44], and institutional support [45] to overcome adversities, foster resilience, and attain success. However, few studies have explicitly synthesized this available resource into a form of adversity coping resource or competitive advantage. Adversity coping resources represent psychological and behavioral capitals utilized by individuals to cope with challenges and uncertainties in the entrepreneurial process. We view this as a significant untapped area for further investigation and provide some encouraging perspectives:

(1) The relationship between coping resources and adversity perception requires further exploration. Considering the significance of emotions and self-efficacy in influencing entrepreneurial behavior, it is intriguing to explore the coping resources that entrepreneurs possess to deal with adversity, both individually and within their organizations.

(2) Future research should explore how entrepreneurs cultivate and leverage resource-based capabilities to manage constraints and uncertainty in resource acquisition. Most studies have employed quantitative methods to examine adversity perception and resulting outcomes from a psychological perspective [37, 46, 47]. A qualitative or mixed-methods approach holds promise for advancing ECS research, providing valuable insights from a resource-based perspective.

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MS0075: A Friend in Need is a Friend Indeed: Acquiring Financial Resources from Stakeholders in the Era of Geopolitical Crisis

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A friend in need is a friend indeed: acquiring financial resources from stakeholders in the era of geopolitical crisis

Abstract

This paper examines the precautionary behaviors of firms to navigate the potential escalation of geopolitical crises via seeking support from key stakeholders. Using the sample of Chinese listed firms between 2015 and 2021, we find that after observing peer firms in the same industries sanctioned amid the geopolitical turbulence, these unsanctioned firms are more likely to seek financial support from key stakeholders, such as investors, banks and suppliers. Our study further shows that these firms are more likely to receive stakeholders' support if their industry turbulence is higher and their own financial performance is better. The paper contributes to the recent discussions on geopolitical turbulences by exploring under what conditions firms are more inclined to pursue financial support from stakeholders.

Keywords: geopolitical crisis; financial resources; sanctions; stakeholders

1. INTRODUCTION

Crises disrupt the business environment swiftly and significantly, exerting substantial impacts on firms and necessitating strategic responses (Raithel & Hock, 2021; Wenzel et al., 2021). Prior studies have identified various firm strategies such as cost reduction within specific organizational functions (Flammer & Ioannou, 2021), asset retrenchment (Barbero et al., 2020), and the narrowing of business scope (De Figueiredo et al., 2019) in response to crises, with the aim of sustaining or reinvigorating their performance (Wenzel et al., 2021). While prior studies have extensively investigated the implications of the 2008 global financial crisis (e.g., Des Jardine et al., 2019; Dowell et al., 2011; Flammer & Ioannou, 2021), recent scholarly attention has shifted to the rising geopolitical crisis characterized by deglobalization, worldwide military conflicts, and international sanctions, among others (Beugelsdijk & Luo, 2024; Meyer et al., 2023; Witt et al., 2023). It is emphasized that firms need to create a resource buffer to enhance resilience when dealing with crises, and they must re-evaluate the balance between efficiency and resilience in organizational decision-making (Williams et al., 2017). Particularly in light of the recent geopolitical crisis, the necessity to prioritize resilience-

building has been highlighted in the transition from a liberal to a politicized economy (Beugelsdijk & Luo, 2024).

However, in the era of geopolitical crisis, building resilience is notably challenging as the context is time-compressed, unstable, and unpredictable. Firms often struggle to do this independently (Wenzel et al., 2021), highlighting the importance of external support. Nonetheless, extant studies primarily examine internal methods of responding to crises (e.g., layoffs and asset retrenchment), or how firms can build resource buffers in a relatively independent manner (e.g., Barbero et al., 2020; Dowell et al., 2011; Flammer & Ioannou, 2021), often overlooking stakeholder engagement, which is an essential aspect of external support. In addition, most studies on crises focus on post-crisis recovery, often ignoring the precautionary behaviors needed to prepare for the potential escalation of the crisis. This is particularly relevant for the geopolitical crisis, which is long-lasting and uncertain, leaving firms unable to predict whether, when, or how the crisis will end, decline, or intensify (Witt et al., 2023).

Therefore, this paper aims to explore how firms can create a resource buffer and build resilience by seeking support from stakeholders to prepare for the potential escalation of a geopolitical crisis. We apply stakeholder theory and resilience literature in the context of sanctions, which are a representative tool often used in geopolitical tensions. We propose that when firms observe their peer firms within the same industry (hereafter referred to as peer firms) being sanctioned, they will feel the necessity to prepare for potentially upcoming sanctions, making them more inclined to acquire external financial resources to create a resource buffer through key stakeholders such as banks, investors, and suppliers. Since stakeholders and focal firms are embedded in reciprocal relationships (Donaldson & Preston, 1995; Bosse et al., 2009), stakeholders consequently have strong incentives to help firms navigate crises by sharing critical resources for the benefit of the interdependent network (Harrison et al., 2010; Tantalo & Priem, 2016). However, as the stakeholder-firm relationship is a two-way relationship, and there are multiple firms within the sanctioned industries, stakeholders will also evaluate what firms they would like to support. We further argue that firms are more likely to receive stakeholders' support if their industry turbulence is higher and their own financial performance is better.

Using a sample of publicly listed firms in China from 2015 to 2022, we test the proposed theoretical framework with empirical evidence and make several contributions to the relevant literature. First, we enrich crisis research by suggesting the importance of seeking external help and acquiring critical resources from key stakeholders to build resilience in response to crises. Consequently, we complement prior crisis research that mainly focuses on internal resources and strategies for crisis response (Flammer & Ioannou, 2021). We further identify important industrial and organizational contingencies under which firms tend to prioritize resilience building and seek external help from stakeholders when responding to crises. Meanwhile, we also advance stakeholder theory, which traditionally emphasizes how firms should consider their impact on various stakeholders (Parmar et al., 2010), by discussing how firms can actively seek their assistance and support. Moreover, in contrast to existing studies on resilience that primarily focus on post-adversity recovery (Williams et al., 2017), we contribute to the literature by exploring the precautionary behaviors of firms in preparing for the potential escalation of crises.

2. THEORY AND HYPOTHESES

2.1 Building resilience in crises

The recent geopolitical crisis, now a focal point in crisis research (Meyer et al., 2023; Witt et al., 2023), has underscored the importance of building resilience and creating a financial resource buffer. The increasing politicization of international business, marked by deglobalization, decoupling, and international sanctions, highlights the urgency and necessity for firms to develop robust strategies to navigate the turbulent environment (Vertinsky et al., 2023). Traditionally, scholars have emphasized the importance of efficiency in achieving economic returns, especially when dealing with financial crises. However, as an efficiency orientation may lead to vulnerabilities under disruptions, scholars and practitioners now suggest a strategic shift from efficiency pursuit to resilience building in the era of geopolitical crises (Beugelsdijk & Luo, 2024). Specifically, while efficiency highlights cost minimization and process optimization, often achieved through leanness (e.g., less slack) (Ivanov et al., 2014), resilience emphasizes the ability to “prepare for, respond to” (Li, 2020: 1), and “bounce back” from adversity. Firms need to build resilience and create financial resource buffers, entailing a

multistage process that involves pre-, during-, and post-crisis efforts to avoid a catastrophe or to mitigate its evolution (Stoverink et al., 2020: 397; Williams et al., 2017).

2.2 Seeking external financial support from stakeholders to build resource buffer

We apply the stakeholder theory to the context of Sino-U.S. trade war as a salient geopolitical crisis and consider U.S. sanctions on China as a representative escalation of the circumstances. Sanctions function as an “instrument of coercive diplomacy” (Felbermayr et al., 2021: 3) that force the targets to act in accordance with the objectives of imposers; sanctions intensify the environmental turbulence via disrupting institutional landscape significantly and unexpectedly, highlighting the necessity of building resource buffer (Meyer et al., 2023).

Drawing on the stakeholder theory, we argue that firms perceiving the risks are prompted to seek external financial support from key stakeholders, such as *banks, investors, and suppliers* (Parmar et al., 2010), which are the primary financing sources (Du & Zhao, 2023). Due to their interdependence, stakeholders are motivated to sustain a benefit provider (i.e., the focal firm) in the business network via sharing the needed financial resources (Harrison et al., 2010). In addition, key stakeholders and focal firms may operate in different industries and value chains which are not concurrently undergo crises, thereby affording stakeholders the capacity to offer assistance when focal firms experience the heightened risks. For instance, when a focal firm within a strategic industry (e.g., semiconductor) face high probability of being sanctioned, their banks, investors and suppliers might not be in the risky sections and possesses the ability to provide support. Therefore, firms can be prompted by potential escalation of crises to seek assistance from banks via requesting emergency lines of credit or restructuring existing loans, from investors through additional capital, and from suppliers in the form of delayed payment.

H1: Firms are more likely to receive external financial support from key stakeholders to prepare for the potential escalation of geopolitical crises.

2.2 Conditions when stakeholders are more willing to support

We argue that in more turbulent industries, not only firms are more actively to seek support, but stakeholders are also more willing to support firms.

Hypothesis 2: Firms in a more turbulent industry are more likely to receive external financial support from key stakeholders to prepare for the potential escalation of geopolitical crises.

Financial performance demonstrates a firm’s internal ability to generate, an essential type of financial resource (Brealey et al., 2017). Given that a fundamental objective of any firm is the continuous enhancement of its value and shareholder wealth, excellent profitability indicates a firm’s efficacy in achieving its goals (Vernimmen et al., 2022). Therefore, we posit that high-performing firms are more likely to receive the financial support from stakeholders. Therefore, we hypothesize:

Hypothesis 3: Firms with better financial performance are more likely to receive external financial support from key stakeholders to prepare for the potential escalation of geopolitical crises.

3. METHODS

3.1 Sample

We use a sample of publicly listed companies in China between 2015 and 2021 to investigate the impact of US sanctions on Chinese firms’ financing decisions. We extracted our data from the Wind and CSMAR (China Stock Market & Accounting Research) databases, which are the two most important with respect to Chinese publicly listed firms. We collected the list of sanction companies from the Entity list released by the US Department of Commerce.

3.2. Variables

	Variables	Variable symbols	Measurement
Dependent Variables	Cash dividends	Cash_D	The ratio of cash dividends per share before tax to basic earnings per share
	Long-term loans	LLoan	the ratio of long-term loans to total assets
	Trade credits	TradeCredit	accounts payable minus the industry means to measure
Independent Variable	Sanctions policy implementation effects	Treat×Post	Treat is the policy variable, if the firm belongs to the same industry as the sanctioned firm, the value is 1, otherwise 0; Post is the time variable, the year of the sanctioned firm is assigned to 1, otherwise 0
Moderating Variables	Firm performance	ROA	The ratio of profit margin to the total assets
	Industry volatility	IndV	Standard deviation of industry sales revenue divided by the mean
Control Variables	Firm ages	Age	Listing age
	Firm growth	Growth	The ratio of growth in operating income
	R&D investment density	RD	The ratio of R&D investment to sales revenue



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MS0076: Influence of Restaurant Online Reviews' Characteristics on Credibility: A Study Among Young Consumers

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Influence of Restaurant Online Reviews' Characteristics on Credibility:

A Study Among Young Consumers

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Extended Abstract

This study investigates the determinants of Reviews Credibility in restaurant online reviews among young consumers in Thailand. It examines the impact of Reviews Accuracy, Reviews Completeness, Reviews Ratings, and Platform Reputation on Reviews Credibility, alongside the moderating effects of Consumers' Involvement and Consumers' Prior Knowledge. Utilizing the Elaboration Likelihood Model (ELM) and Involvement theory, data from 252 online survey participants were analyzed using Multiple Linear Regression. The findings indicate that Reviews Accuracy, Reviews Completeness, and Platform Reputation positively influence Reviews Credibility, while Reviews Ratings do not. Additionally, Consumers' Involvement and Prior Knowledge positively impact Reviews Credibility but do not moderate the relationships as expected, suggesting contextual differences. The study contributes to the understanding of consumer behavior and offers practical implications for businesses and marketers.

Keywords: Reviews Credibility, Online Reviews, Elaboration Likelihood Model, Consumer Behavior, Involvement Theory

1. Introduction

In today's digital age, the rise of the internet and social media has profoundly influenced consumer behavior, transforming how individuals connect, communicate, and make purchasing decisions (Iorgulescu, 2016; Singh, Chaudhuri, & Verma, 2017; Thangavel, Pathak, & Chandra, 2022)

Among these digital phenomena, Electronic Word of Mouth (eWOM), especially online reviews, has emerged as a significant factor influencing consumer attitudes and behaviors (Huete-Alcocer, 2017). Reviews Credibility, the degree to which individuals trust online reviews, plays a crucial role in reducing consumer uncertainty and impacting company reputation and brand image (Hazée, Van Vaerenbergh, & Armiroto, 2017). This study focuses on understanding the determinants of Reviews Credibility in restaurant reviews among young consumers in Thailand, addressing the research question: "Which review characteristics contribute to the credibility of restaurant online reviews as perceived by young consumers in Thailand?" By applying the Elaboration Likelihood Model (ELM), the study examines how Reviews Accuracy, Reviews Completeness, Reviews Ratings, and Platform Reputation influence Reviews Credibility, with Consumers' Involvement and Prior Knowledge as moderating variables.

2. Literature and Framework

2.1. eWOM and Online Reviews

Electronic Word of Mouth (eWOM) retains the trustworthiness of traditional WOM because it involves non-commercial, peer-generated content, which consumers perceive as more reliable than advertisements (Arndt, 1967; Brown, Broderick, & Lee, 2007). A primary form of eWOM is online reviews, which provide independent insights and experiences that potential buyers use to inform their purchasing decisions (Racherla, Connolly, & Christodoulidou, 2013; Zhu, Li, Wang, He, & Tian, 2020).

2.2 Elaboration Likelihood Model (ELM)

The Elaboration Likelihood Model (ELM), proposed by Petty and Cacioppo (1986), is a widely used framework to understand how individuals process information and make decisions in the context of online reviews. ELM identifies two routes to persuasion: the central route, which involves deep cognitive processing and careful consideration of message content, and the peripheral route, which relies on cues and heuristics, such as source reputation, to form judgments without extensive cognitive effort (J. Kitchen, Kerr, E. Schultz, McColl, & Pals, 2014).

2.3 Young Consumers

This study focuses on young consumers aged 18 to 26, aligning with recent research (Bonnie & Stroud, 2017; Gupta, Kumar, & Melese, 2023). Their significant influence on family spending and large presence on platforms like TikTok, Facebook, Instagram, and X highlight their impact and importance in contemporary consumer research (Kamal & Shnarbekova, 2021; Vuleta, 2023).

2.4 Reviews Credibility and Their Determinants

Reviews credibility refers to the degree to which individuals perceive online reviews as trustworthy and authentic (Fang, 2014). Credible online reviews significantly impact a company's reputation and brand image, which in turn can reduce consumer uncertainty (Chakraborty & Biswal, 2020; Hazée et al., 2017) and influence their acceptance and decision-making (Lin & Xu, 2017; Shan, 2016). Prior studies identified several characteristics influencing reviews' credibility e.g. accuracy, completeness, ratings, and platform reputation (Thomas, Wirtz, & Weyerer, 2019; Tran & Can, 2020).

Reviews Accuracy: Accuracy is critical for perceived credibility, as it involves the correctness of the review content (Ahmed & Farid, 2013). Accurate reviews align with the company's description and are based on the author's true experiences (Aghakhani, Oh, & Gregg, 2017; Moriuchi, 2018).

Hypothesis 1: Restaurant online reviews accuracy has a significantly positive impact on reviews credibility.

Reviews Completeness: Completeness refers to the extent a review covers relevant aspects, enhancing credibility by providing sufficient information (Luo, Luo, Schatzberg, & Sia, 2013). Comprehensive reviews aid in informed decision-making (Canet, De Luna, Pulumbarit, & Zapata, 2023).

Hypothesis 2: Restaurant online reviews completeness has a significantly positive impact on reviews credibility.

Reviews Ratings: Review ratings, typically displayed as stars or scores, serve as cognitive shortcuts, influencing credibility and information adoption without requiring extensive evaluation (Cheung, Luo, Sia, & Chen, 2009; Kim & Park, 2017).

Hypothesis 3: Restaurant online reviews ratings have a significantly positive impact on reviews credibility.

Platform Reputation: The credibility of the platform hosting the reviews also impacts the perceived credibility of the reviews themselves (Chih, Wang, Hsu, & Huang, 2013; Hovland & Weiss, 1951). Higher platform reputation usually translates to greater trust in its reviews (Bart, Shankar, Sultan, & Urban, 2005; C. Park & Lee, 2009).

Hypothesis 4: The platform reputation has a significantly positive impact on reviews credibility.

Consumers' Involvement: Involvement theory has also been applied in recent studies regarding the impact of online reviews' characteristics on consumer intention and decision-making behavior (Aureliano-Silva, Leung, & Spers, 2021; Lim, Ng, Chuah, Cham, & Rozali, 2019; Liye, Denghua, & Jingyi, 2017; O.-J. Park, Kim, & Ryu, 2019). The involvement theory posits that consumers' responses depend on the perceived importance of the product, shaping their purchase intention and behaviors (Laurent & Kapferer, 1985; Mittal, 1995).

Hypothesis 5: Consumers' involvement has a significantly positive impact on reviews credibility.

Hypothesis 5a: Consumers' involvement significantly and positively moderates the impact of restaurant online reviews accuracy on reviews credibility.

Hypothesis 5b: Consumers' involvement significantly and positively moderates the impact of restaurant online reviews completeness on reviews credibility.

Hypothesis 5c: Consumers' involvement significantly and positively moderates the impact of restaurant online reviews ratings on reviews credibility.

Hypothesis 5d: Consumers' involvement significantly and positively moderates the impact of the platform reputation on reviews credibility.

Consumers' Prior Knowledge: Consumers' knowledge about a product or service influences their information processing and decision-making behaviors (Alba & Hutchinson, 1987; Brucks, 1985;

Moorman, Diehl, Brinberg, & Kidwell, 2004). It enhances the ability to comprehend information, potentially aiding in the processing of new information (Ghosh, Varshney, & R.V., 2022; Kurniawati & Widodo, 2017; Punj & Staelin, 1983).

Hypothesis 6: Consumers' prior knowledge has a significantly positive impact on reviews credibility.

Hypothesis 6a: Consumers' prior knowledge significantly and positively moderates the impact of restaurant online reviews accuracy on reviews credibility.

Hypothesis 6b: Consumers' prior knowledge significantly and positively moderates the impact of restaurant online reviews completeness on reviews credibility.

Hypothesis 6c: Consumers' prior knowledge significantly and positively moderates the impact of restaurant online reviews ratings on reviews credibility.

Hypothesis 6d: Consumers' prior knowledge significantly and positively moderates the impact of the platform reputation on reviews credibility.

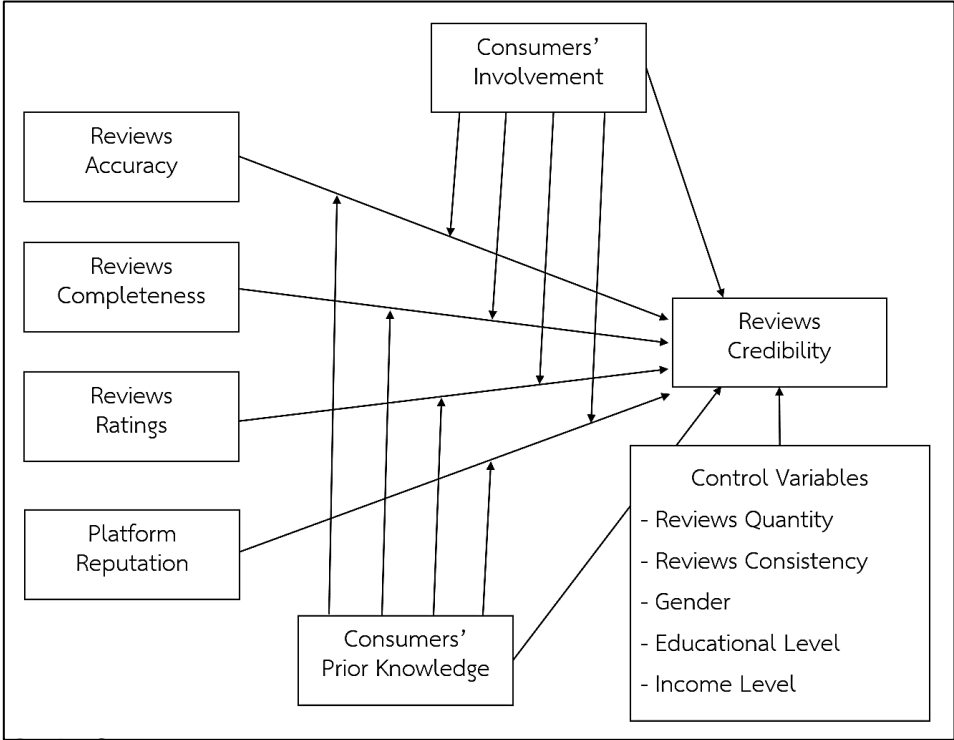


Figure 1: Research Framework

3. Research Methodology

This study employs a deductive approach with a quantitative method using questionnaires to investigate the factors influencing online reviews' credibility among young consumers in Thailand. According to the ELM, reviews accuracy and completeness represent the central route, while reviews ratings and platform reputation signify the peripheral route. G*Power software suggested a sample size of 163, yet this research collected a total of 252 samples, ensuring robust data collection through online surveys. Data analysis involves multiple regression techniques using SPSS.

4. Results and Discussion

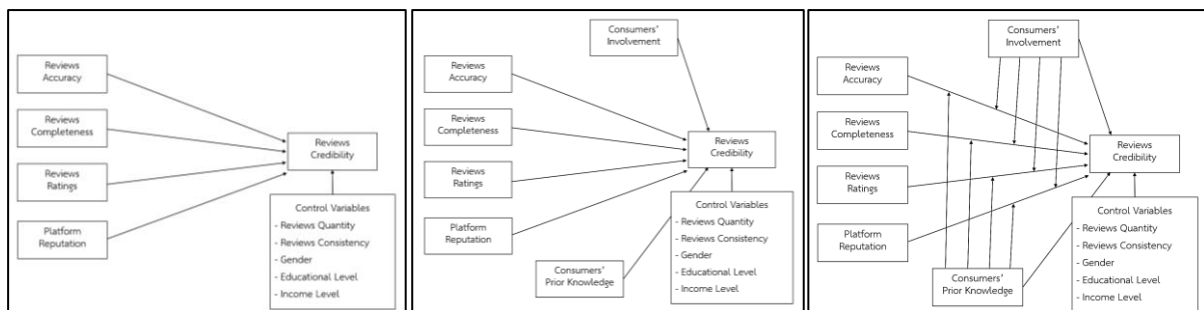


Figure 2: Model 1, Model 2, and Model 3 (respectively from left to right)

In order to study the initial set of hypotheses proposed, the researcher conducted multiple linear regression analysis within the framework of three models. Model 1 encompassed the dependent variable, Reviews Credibility, along with four independent variables: Reviews Accuracy, Reviews Completeness, Reviews Ratings, and Platform Reputation. Five control variables were included due to their potential impact: Reviews Quantity, Reviews Consistency, Gender, Educational Level, and Income Level.

Model 2 extended Model 1 with moderating variables, Consumers' Involvement and Consumers' Prior Knowledge, to explore their direct effects on Reviews Credibility. Model 3 further introduced eight interaction terms between each moderator and the four independent variables. The results are in Table 1.

Multiple Regression Analyses

Model	Variables	Beta	t-value	p-value	VIF
1	(RA) Reviews Accuracy	.294	5.705	<.001	1.734
	(RC) Reviews Completeness	.207	3.735	<.001	1.998
	(RR) Reviews Ratings	.087	1.575	.116	1.994
	(PR) Platform Reputation	.386	6.538	<.001	2.274
	(RQ) Reviews Quantity	-.093	-1.765	.079	1.820
	(RS) Reviews Consistency	.089	1.695	.091	1.783
	Gender: Male and LGBTQIA+	.057	1.414	.159	1.077
	Edu: Bachelor's Degree and Higher	-.035	-.661	.509	1.830
	Income Level	.068	1.314	.190	1.731
	R ²	.629			
R ² Change	.629		<.001		
2	(RA) Reviews Accuracy	.225	4.374	<.001	1.891
	(RC) Reviews Completeness	.165	3.081	.002	2.047
	(RR) Reviews Ratings	.083	1.571	.117	1.997
	(PR) Platform Reputation	.392	6.946	<.001	2.281
	(RQ) Reviews Quantity	-.145	-2.810	.005	1.900
	(RS) Reviews Consistency	.061	1.209	.228	1.808
	Gender: Male and LGBTQIA+	.069	1.774	.077	1.082
	Edu: Bachelor's Degree and Higher	-.032	-.629	.530	1.908
	Income Level	.067	1.349	.179	1.745
	(CI) Consumer's Involvement	.141	3.036	.003	1.544
	(CK) Consumer's Prior Knowledge	.139	2.969	.003	1.581
R ²	.666				
R ² Change	.036		<.001		
3	(RA) Reviews Accuracy	.214	3.821	<.001	2.209
	(RC) Reviews Completeness	.179	3.181	.002	2.233
	(RR) Reviews Ratings	.068	1.247	.214	2.093
	(PR) Platform Reputation	.388	6.511	<.001	2.511
	(RQ) Reviews Quantity	-.153	-2.857	.005	2.019
	(RS) Reviews Consistency	.052	.997	.320	1.900
	Gender: Male and LGBTQIA+	.066	1.632	.104	1.168
	Edu: Bachelor's Degree and Higher	-.034	-.642	.522	2.039
	Income Level	.065	1.281	.201	1.833
	(CI) Consumer's Involvement	.109	2.023	.044	2.058
	(CK) Consumer's Prior Knowledge	.155	3.062	.002	1.822
	CI * RA	.010	.154	.878	3.039
	CI * RC	-.077	-1.145	.253	3.209
	CI * RR	-.014	-.210	.834	2.924
	CI * PR	-.030	-.437	.662	3.362
	CK * RA	.051	.859	.391	2.458
	CK * RC	.019	.297	.767	2.971
	CK * RR	.012	.199	.842	2.742
	CK * PR	-.013	-.194	.846	3.089
	R ²	.672			
R ² Change	.006		.806		

Table 1: Regression Analysis Results

Examining the R-square values, Model 1 ($R^2 = .629$) showed a significant explanatory power. The introduction of moderating variables in Model 2 ($R^2 = .666$, R^2 Change = .036, R^2 Change Significance < .001) indicated that these moderators have direct effects on the dependent variable. However, adding the eight interaction terms in Model 3 did not significantly improve the model's explanatory power, leading to the rejection of Model 3 due to its lack of parsimony. Consequently, Hypotheses 5a through 5d and Hypotheses 6a through 6d were rejected as well.

Model 2 affirms the significant roles of Reviews Accuracy, Reviews Completeness, Platform Reputation, Consumers' Involvement, and Consumers' Prior Knowledge in bolstering credibility, thus supporting Hypotheses 1, 2, 4, 5, and 6. Surprisingly, Reviews Ratings showed no discernible impact on credibility, influenced by growing skepticism towards numerical ratings amid concerns about online misinformation (Lazer et al., 2018; Pennycook & Rand, 2020). Furthermore, both Consumers' Involvement and Consumers' Prior Knowledge directly influenced positively with Reviews Credibility, indicating that more engaged consumers or those with greater prior knowledge perceive online reviews as more credible. Interestingly, neither Consumers' Involvement nor Consumers' Prior Knowledge significantly moderated the relationships between review attributes and credibility in this context.

Our examination of consumer behavior highlighted contrasts between durable goods and restaurant choices, as durable goods involve higher costs and necessitate thorough research due to limited purchase opportunities, whereas dining out offers a more frequent and transient consumer experience with lower long-term commitment. Hence the contradictions in results between this and prior studies.

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MS0080: Audit Delay during Regulatory Relief of Reporting Deadline: Evidence from Hong Kong

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Audit Delay during Regulatory Relief of Reporting Deadline: Evidence from Hong Kong

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Abstract

Considering the adverse impact of the COVID-19 pandemic and the subsequent travel restrictions imposed by the governments of Hong Kong and China on audit process, Hong Kong securities regulators extended the audited financial reporting deadline from March 31, 2020, to mid-May 2020, for companies with a fiscal year ended December 31, 2019. We use this setting to investigate the determinants and consequences of such audit delay. We find that the travel restrictions have no significant effect on audit delay, while client firms with higher unexpected business risk and audit risk, and with audit firm and/or partner rotation, are more prone to delay financial reporting. Using a matched sample of delay firms and non-delay firms, we show that audit delay results in less informative earnings numbers. Further analyses demonstrate that delay firms experience a greater change in key audit matter topics, a larger increase in audit fees, and a higher likelihood of switching audit firms in the subsequent year. Yet, we do not find any significant association between change in discretionary accruals and delay firms.

Keywords: Audit delay, audit report lag, regulatory relief, audit risk, business risk

JEL Classification: G24, G41, J62

Extended Abstract

Firms have incentive to provide investors with timely financial reporting, but the release of financial statements is often delayed by the time-consuming audit process. The causes and consequences of audit report lag have been explored by prior literature (e.g., Ashton et al. 1987; Blankley et al. 2014). Yet conclusions regarding the underlying motivations for an unusually long audit and its implications for reporting quality remain mixed and unclear. This ambiguity stems primarily from the endogenous nature of the decision to conclude on audited financial statements in most circumstances. On the one hand, the client management has strong incentive to release audited financial results before the reporting deadline. On the other hand, the auditor has incentive to increase audit assurance and reduce audit liability. Thus, when auditors face the “unbreakable” reporting deadline and can no longer delay audit reporting, they often increase audit fees or even withdraw from future engagements to compensate the heightened audit risk (Landsman et al. 2009; Stanley 2011).

We revisit this critical issue within a unique context, where firms and auditors face an unanticipated relief of financial reporting deadline. The outbreak of the COVID-19 pandemic in early 2020 and the subsequent travel restrictions imposed by the governments of Hong Kong and China (hereafter “the governments”) may significantly affect audit procedures. Given the unprecedented obstacles and challenges encountered by client firms and auditors in performing audit work and obtaining audit evidence, the Hong Kong regulators granted a 60-day extension for the submission of audited financial statements. Hong Kong provides a unique setting for our study. First, the COVID-19 pandemic outbreak in China and Hong Kong in early 2020, coinciding with the busy season of audits for fiscal year ended December 31, 2019. Second, Hong Kong regulators were the first to extend the reporting deadline, so the extension was unexpected.¹ Third, firms based in the Mainland would be more affected by the stringent travel restrictions imposed by the governments, while locally based listed firms would not be affected by the travel

¹ The Securities and Futures Commission (SFC) and The Stock Exchange of Hong Kong Limited (HKEX) first issued a joint statement on February 4, 2020, that companies that are unable to publish audited financial results by the reporting deadline should notify HKEX as early as possible and that a waiver is likely to be granted. On March 16, 2020, SFC and HKEX further jointly announced that they are extending a 60-day period for the submission of annual reports. Meanwhile, the Securities and Exchange Commission (SEC) announced on March 25, 2020, that it is providing a 45-day extension for companies to file financial reports. In early April 2020, the China Securities Regulatory Commission (CSRC) encouraged companies to meet the reporting deadline.

restrictions and would be less affected by the pandemic. This differentiation allows us to examine whether audit delay during the COVID-19 pandemic is caused by the travel restrictions and operational difficulties, as considered by the regulators, or by any other abnormal audit risk. Specifically, we refer “audit report lag” to the number of days between the fiscal year end and the audit report date, and “audit delay” to an audit completed after the original reporting deadline, i.e., March 31, 2020. In this study, we investigate how Hong Kong listed firms and auditors respond to the unexpected financial reporting extension and whether such an extension results in improved reporting quality.

Although client firms are eligible to delay their financial reporting after the reporting deadline, they often refrain from doing so to avoid suspension of stock trading.² Listed firms tend to prioritize the timeliness of accounting information, as investors value timely disclosure (Givoly and Palmon 1982; Chambers and Penman 1984; Kross and Schroeder 1984). Abnormally long audit itself is a negative signal to the market, often interpreted by investors that the company may get into trouble with its auditor. Client managers thus strive to adhere to established release schedules to avoid potential negative market consequences. Besides, audits are costly for businesses, and any prolonged audit engagement can result in additional expenses. Therefore, despite the regulatory relief of reporting deadline, we observe that 1,078 out of 1,399 Hong Kong listed firms with fiscal year ended December 31 released their 2019 annual reports by the original deadline of March 31, 2020. Delay firms only consist of 23% in our sample. This suggests that the majority of client firms manage to complete their audit and release their annual reports before the original deadline.

Conceptually, audit report lag can be divided into two components: the normal lag due to the volume of audit work and the efficiency of audit engagement, and the abnormal lag attributed to the unexpected risk associated with the audit, such as ambiguous and subjective management estimation or disputes between the client management and auditor (Blankley et al., 2014). To the extent that the extension of reporting deadline is unanticipated by client firms and auditors, we argue that an audit delay in our setting primarily reflects the abnormal audit lag. Given that client managers have strong incentive to report financial results on a timely basis, while auditors are relieved from a stressed time budget and a need to compromise, an audit delay implies that

² According to Main Board Listing Rule 13.50 and GEM Listing Rule 18.03, companies that fail to fulfill the disclosure requirement of financial results are subject to suspension of stock trading.

auditors have greater discretion in deciding whether to utilize the extended period for further audit work, additional meetings with the audit committee to resolve outstanding matters, or extra negotiation with the client management for acceptable alternative accounting treatments. Our study thus marks a significant distinction from prior research.

First, we investigate the determinants of audit delay. Our multivariate analyses reveal that client firms with higher abnormal business risk, captured by loss-making, volatile stock returns, and a greater fluctuation in the firm size, as well as with higher audit risk, reflected by a modified audit opinion and a going concern opinion, are more prone to delaying their financial reporting. Companies that experience audit firm and/or partner change also face a higher probability of audit delay. However, client firms audited by the Big 4 auditors are less likely to experience delay. These findings are consistent with prior studies (e.g., Ashton et al. 1987) and suggest that audit delay is often caused by increased audit risk. Notably, we do not find evidence that the travel restrictions affect audit delay. Specifically, Hong Kong listed firms that headquartered in the Mainland, despite being more susceptible to the travel restrictions, are not more likely to delay their audited financial reporting. It is unsurprising in the sense that the governments imposed travel restrictions in late January 2020, when most on-site audit procedures had already been completed.

Next, we investigate the consequences of audit delay. Given that client firm fundamental characteristics affect audit report lag, we undertake a propensity score matching (PSM) to construct a matched sample of non-delay firms that have the most similar fundamentals to delay firms. Taking additional time to complete the audit and conclude on the financial statements often becomes a difficult trade-off between audit quality and economic viability (McNair 1991). By taking extra audit effort on the financial statements, audit assurance should increase and audit quality should improve. However, contrary to this conjecture, we find that the earnings response coefficient (ERC) is significantly lower for delay firms, suggesting that the market perceives the earnings reported by delay firms to be less informative. Moreover, delay firms have a greater change in key audit matter (KAM) topics reported in audit reports and incur a larger increase in audit fees, compared to their non-delay counterparts. Yet, we do not find a significant association with change in discretionary accruals for delay firms, indicating that audit quality does not improve significantly after the additional report lag. Audit delay also predicts audit firm rotation in the next fiscal year. These findings support the notion that audit delay is a result of unexpected

audit risk, assassinating auditors' additional time and effort to finalize audit procedures and negotiate with the client management prior to reaching a conclusion.

Since delay firms could announce unaudited financial results before March 31, 2020, we further divide delay firms into three subsets: audited earnings are adjusted upward, downward, or remain the same, compared to the earnings reported on the earnings announcement date. We find that for delay firms that earnings are adjusted downward, they tend to change more in reported KAM topics, incur higher audit fees, reduce earnings management as proxied by change in discretionary accruals, and have a greater likelihood to switch audit firm subsequently. These results reaffirm that auditors consider these firms with higher audit risks, and the downward adjustment of audited earnings, despite strong pressure faced by auditors, reflects audit effectiveness, thereby improving audit quality.

We contribute to literature in two folds. First, we examine the causes of audit lag using a novel setting where client firms and auditors face an unanticipated option to delay audited financial reporting. Hence, we could better capture the abnormal component of audit report lag. We find that auditors take longer to verify client firms' financial statements with higher unexpected business risk and audit risk, thus leading to audit delay. Second, we contribute to the relatively scarce literature on the consequences of audit report lag. Using a matched sample of non-delay firms that have the most similar propensity to delay firms, we demonstrate that, on average, audit delay brings firms negative impacts, including lower ERC, a greater increase in the variety of reported KAMs, additional audit fees, and a higher likelihood of audit firm switch.

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MS0082: Fiscal Decentralization, Local Government Assessment, and Environment Protection: A Difference-in-difference Approach

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Fiscal Decentralization, Local Government Assessment, and Environment Protection: A Difference-in-difference Approach

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Extended Abstract

The paper conducts an empirical study from the perspective of fiscal decentralization on local environment protection which needs monetary support. In addition, this study investigates the change of the effect after the central government requests environment protection to be included in local government performance assessments. Using a DID model, the study finds that altering performance criteria increases local government investment in environmental management, enhancing the influence of fiscal decentralization. It indicates that environmental protection by local governments are better when local governments have money and promotion incentives.

Keyword: fiscal decentralization; environmental governance effectiveness; performance assessment methods

1. Introduction

One of the significant reasons why China's economy has been able to maintain a high rate of growth in the decades following the reform and opening-up is the incentive system provided by the Chinese

government. In the Chinese administrative system and in the Chinese economy, local governments play a very important role. Local governments have more knowledge of the preferences of local people, control the direction, strength, and effectiveness of policy implementation, and are more easily "captured" by local businesses and elites. Furthermore, government governance is strongly shaped by government officials and derives from their discretionary powers and related job responsibilities (Zhou, 2007) [1]. Therefore, creating a reasonable incentive mechanism is particularly important.

Official promotion tournaments are an important form of incentive. Since China's reform and opening up, promotion tournaments have been assessed mainly based on economic performance. As local officials are promoted from the bottom administrative positions, those who are eliminated are automatically disqualified from the next round, and there is an age limit for participants in promotion tournaments, making it more likely that they will lose a promotion once they have lost one. This format leads to a cascading of incentives and increases the pressure on players to focus more on economic development at the expense of other developments, even though inappropriate means to achieve economic goals.

To mitigate the negative effects of promotion tournaments, in 2005 the central government explicitly proposed in the Decision on Implementing the Scientific Outlook on Development and Strengthening Environmental Protection issued by the State Council that environmental protection indicators should be included in the rank assessment of local government leaders and the results should be used as one of the bases for appointing, rewarding and punishing local officials. However, there are still scholars who argue that although the ecological governance performance appraisal provides an incentive for local officials' behavior in ecological governance, local officials still choose to develop the economy in the face of economic and environmental pressures (Sheng and Li, 2018) [2].

While in prior studies, some scholars have found that fiscal decentralization acts as a negative influence on the local environment. Zhang Xinyi (2015) [3] points out that one of the important negative influences brought about by the fiscal decentralization system is environmental pollution. In the paper,

the authors argue through empirical research and case analysis that fiscal decentralization has an incentive distorting effect by promoting the development of highly polluting industries, influenced by the assessment of local economic development rankings and officials' promotion incentives. In terms of expenditure on energy conservation and environmental protection, the study finds that there is a degree of disincentive but no alteration to the negative influence that fiscal decentralization has on environmental pollution.

While in recent years some scholars have found that fiscal decentralization has a positive influence on environmental protection. Such as Zhao Jiajia, Li Shu and Wang Jianlin (2020) [4] presented that fiscal decentralization and transfer payments have a significant influence on the efficiency of fiscal environmental funds through the construction of an endogenous directional distance function model. And Zhao Jiajia et al. (2020) [4] indicated that fiscal decentralization would bring the government closer to the residents where the government has more information, thereby enhancing the efficiency of funds, while decentralization of finance is conducive to generating competition between regions and reducing inefficient behavior.

The question of why fiscal decentralization systems has different effects on relevant aspects of environmental protection is not answered by the existing literature, which is the subject of the paper, which attempts to explain this paradox in terms of government competition and performance assessment.

Local government competition is primarily a championship competition in which officials compete based on performance appraisal (KPI). The central government is empowered enough to reward and punish localities based on several assessment indicators, and local government officials are thus forced to comply with the policy directions of the central government (Blanchard et al., 2001) [5]. 2005 marked the beginning of a performance assessment system for environmental protection for local government leaders in China. So, will the change in the inclusion of environmental protection in officials' assessment

indicators change the impact of fiscal decentralization on the environment? Does it make local governments more motivated to improve the environment?

The majority of the literature is concerned with adverse effects brought about by fiscal decentralization on environmental governance. Zhang Kezhong, Wang Juan, and Cui Xiaoyong found that there is a positive relationship between fiscal decentralization and carbon emissions, with an increase in the extent of decentralization being detrimental to the reduction of carbon emissions, which suggests that fiscal decentralization is likely to diminish the local government's attempts to regulate carbon emissions (Zhang et al., 2011) [6]. The greater the degree of fiscal decentralization, the more detrimental it is to environmental governance. In the meantime, some scholars have also taken into account transfer payments, government competition, and other aspects, with the result that most of them is that the higher the degree of fiscal decentralization, the worse the effects. This distortion of fiscal spending may cause local governments to increase their spending on environmental protection, and because fiscal decentralization is the granting of a certain limit of autonomy to localities by the central government, this vertical system of political management also brings about competition from the top down in terms of ruling standards and the possibility of corruption in local governments.

Some scholars have also attempted to explain this. Fu Yong (2010) [7] classified the public goods provided by local governments into economic public goods and non-economic public goods, with the former including transportation, energy, and communication, and the latter including environmental protection facilities, health care, culture, and education, social welfare, etc. According to Fu Yong, fiscal decentralization lowers the quality of the supply of non-economic public goods. The higher the degree of decentralization, the smaller the area of green space per capita, the lower the urban water penetration rate and the lower the urban gas penetration rate, and thus the poorer the urban utilities. In other words, the higher the degree of decentralization, the lower the level of green space per capita. In the meantime, he suggested that downward transfers can productively ameliorate the provision of non-economic public goods. Wu Xun and Bai Lei (2019)[8] demonstrated that fiscal decentralization is positively related to haze pollution, as fiscal decentralization exacerbates haze pollution.

More recently, some scholars have found that fiscal decentralization has a beneficial effect on environmental protection, for example, Zhao Jiajia, Li Shu, and Wang Jianlin (2020) [4] suggest that fiscal decentralization and transfer payments have a remarkable effect on the efficiency of fiscal environmental funds, i.e. transfer payments worsen the use of funds, while fiscal decentralization has low efficiency in the use of environmental funds. Excessive fiscal decentralization has also not been conducive to the efficient use of funds. Tang Yiqiu and Shi Jie (2019) [9] presented that local governments' catch-up behavior has different impacts on cities at different levels of economic development: the catch-up behavior of local governments in less economically developed city clusters such as third and fourth-tier cities can bring positive impacts on the improvement of environmental governance efficiency, but the catch-up behavior of local governments in economically developed city clusters such as first-tier and new first-tier cities is not conducive to the improvement of environmental governance efficiency. The non-linear impact of fiscal decentralization on environmental governance efficiency is mainly distributed in regions with lower administrative levels and backward economic development. Zhou Li (2018)[10] stated that local governments have an economic governance bias and are prone to neglect social expenditures, resulting in the inferior position of environmental protection expenditures in the public finance expenditure system; the general transfer payment method has a negative influence on local government environmental protection expenditures, while special transfer payments have a positive incentive effect, and the incentive effect of China's transfer payment system on local government environmental governance is not adequate.

The varying outcomes of fiscal decentralization on the local environment may be largely attributable to local governments. Fiscal decentralization and government competition which are based on achievement assessments in the Chinese government have been found by some scholars to have created an obvious distortion in the public expenditure structure of local governments, which "emphasis on capital construction, while light on human capital investment and public services", and that government competition can exacerbate the distortion of government expenditure structure by fiscal decentralization.

The ultimate impact of competition on the structure of expenditure is determined by the extent of decentralization [11].

Local government competition has a dampening effect on the improvement of green development efficiency. The economic catch-up among local governments and the promotion incentives of officials lead to faster economic development at the expense of ecological and environmental damage. The combined effect of local government competition and environmental regulation has an inhibiting effect on the improvement of green development efficiency, with local governments choosing more to develop the economy faster between developing the economy and protecting the environment while neglecting the quality of economic development and damaging the ecological environment [12]. Fu Yong, and Zhang (2010) [11] mentioned that competition is another essential source of influence on the structure of fiscal expenditure, and that the higher the level of competitive effort of local governments, the more productive the expenditure structure will be. Local governments competing to provide public goods and attract factors of production such as capital and technology will expand infrastructure development, often resulting in more investment in infrastructure than is optimal. Fu Yong and Zhang Yan (2007) [11] show that when local spending decentralization is small and autonomy is low, competition will cause local governments to reduce the share of capital investment. The effect of competition on the share of capital expenditure is positive if and when fiscal decentralization surpasses a critical level. Furthermore, there may be an interaction between competition and fiscal decentralization in the structure of government spending.

Some scholars suggest that the impact of local government competition on the ecological environment is primarily based on three views: the first is that the “GDP-oriented” promotion assessment index for officials promotes local governments to lower their regulatory standards for environmental pollution, and that competition between governments reinforces distortions in government behavior; the second is that there is horizontal competition among local governments, which sacrifices the environment for economic growth for short-term gains; and the third is that there is no incentive to carry out environmental management to prevent neighboring regions from “free-riding”. Lu Fengzhi, Yang

Haochang (2019) [13], and Li Guanglong, Zhou Yunlei (2019) [14] all empirically study that both environmental decentralization and local government competition have a common impact on environmental pollution, as well as that local government competition is detrimental to environmental governance.

The paper explores the role of policy change by modeling DID and concludes that changes in performance assessment criteria increase local government investment in environmental governance, allowing fiscal decentralization to have an increasing influence on local environmental indicators, while government short-sightedness exists and incentives constitute a major motivator for the behavior of local government officials.

The paper's main contributions include the following three points. First, the paper explores the strength of the influence of fiscal decentralization on the effectiveness of environmental governance caused by changes in performance assessment criteria. The paper finds that the inclusion of environmental effectiveness in KPIs has an impact on the behavior of all local governments. Second, the paper confirms, on the other hand, that local governments do behave shortsightedly, i.e. focusing on economic development at the expense of the ecological environment, while also reflecting some extent that government officials are rational, i.e. classifying environmental protection as part of performance appraisal, making local governments invest energy in environmental governance. Thirdly, the paper shows that KPIs have an incentive effect on government officials from another perspective.

The research framework of the paper consists of four parts. Part I briefly describes the current research findings and the contribution of this paper, while Part II presents the research findings on fiscal decentralization and environmental pollution, fiscal decentralization and government competition, and government competition and environmental governance. Part III presents the research design, clarifying the meaning of the relevant variables and the research ideas. Part IV presents the empirical results, exploring the mechanisms and drawing preliminary conclusions based on the research findings. Part V is a robustness test, which explores the stability of the results in three ways: excluding the effects of

other policies over the period of the study data, using different fiscal decentralization indicators, and screening out different regions, and we conclude with a summary of the full paper.

2. Materials and Methods

The paper looks initially at the changes in indicators for each province from 2001 to 2010 and has come to the following conclusions: in terms of the degree of change in fiscal decentralization, it is found that the extent of fiscal decentralization has not changed in most provinces, while in the remaining provinces half of the provinces have become more fiscal decentralized and the other half are becoming less fiscal decentralized. From the perspective of the effectiveness of industrial environmental protection, essentially all provinces contribute to environmental protection, and some provinces are not as effective as others because the industry does not account for a large proportion of the province. For this reason, the regions where fiscal decentralization has had a large impact will be the main ones selected for the study.

There are two steps in the research process of the paper. The first step is to explore which areas where fiscal decentralization has a greater impact on environmental pollution. These areas show that fiscal decentralization has a greater impact on the environment, and then when the behavior of local governments changes, the results of environmental governance are more evident. In the second step, a DID method is used to explore the extent to which changes in KPIs make fiscal decentralization have an impact on the environment. As the timing of the inclusion of environmental protection in KPIs varies from region to region, this paper takes 2005 as the time of the policy shock, as the State Council issued the Decision on Implementing the Scientific Outlook on Development and Strengthening Environmental Protection, which explicitly proposed to include environmental protection indicators in the ranking assessment of local political leaders and to use the results as one of the bases for appointing, rewarding and punishing local officials. If it is concluded that the KPI change has led to a greater degree of impact of fiscal decentralization on the environment, it suggests that the government is rational and that incentives constitute an important motivation for the behavior of local government officials, and that this government initiative can bring greater benefits. If the results are not significant,

then the local government is not rational enough and the local government takes responsibility for environmental protection, a responsibility that is spontaneous.

2.1. Study of areas where fiscal decentralization has a high impact on environmental protection

Choosing regions where fiscal decentralization has a high impact on environmental protection can more clearly reflect the impact when the content of the performance appraisal is changed. Aiming to find regions where financial decentralization has a greater impact, concerning the study by Tang Yiqiu and Shi Jie (2019), the econometric model was set up as follows:

$$\ln_ep_{it}=\beta_0+\beta_1\times FD_{it}+\beta_2\times \ln_transfer_{it}+\beta_3\times fd_transfer_{it}+\beta_4\times GOV_{it}+\beta_5\times STR_{it} \quad (1)$$

The paper uses panel data for 29 provinces in China from 2001 to 2010, where data for Tibet and Qinghai were excluded due to incomplete data. Industrial dust removal, industrial soot removal, and industrial Sulphur dioxide removal for each province were obtained from environmental protection databases, meteorological stations, etc. Data on transfers from the central government to provinces, autonomous regions, and municipalities directly under the central government are obtained from the China Financial Yearbook, while the rest of the data are obtained from the Statistical Yearbook. The variables in the equation are shown in Table 1. μ_i denotes province fixed effects. v_t represents year-fixed effects. ε_{it} is the random error term. Also, to exclude the effect of extreme values, all the explanatory variables are subjected to a 1% tail shrinkage in the paper.

Table 1. Variables and explanation

Variables	Explanation
ep	Effectiveness of environmental protection
FD	Degree of fiscal decentralization
transfer	Transfer payments
GOV	Quality of government
STR	Level of industrialization
rj_gdp	GDP per capita
fd_transfer	Cross-section of fiscal decentralization and transfer payments

2.1.1. Effectiveness of environmental protection calculating method

Using principal component analysis, the industrial dust removal, industrial fume removal, and industrial sulfur dioxide removal were combined into one-dimensional data and logged to reduce the order of magnitude differences between the data of different explanatory variables. This means that the covariance matrices of industrial dust removal, industrial fume removal, and industrial sulfur dioxide removal are first constructed, followed by the eigenvalues and eigenvectors of the matrices, to telescope the vectors, and then sorting the multiple eigenvalues in descending order, selecting the first eigenvector as the result of the dimensionality reduction. By reducing the dimensionality of the data, it is possible to examine the effectiveness of environmental protection in several ways to form an indicator.

2.1.2. The degree of fiscal decentralization

Zhang Guang (2011) [15] provided five types of indicators of fiscal decentralization, which were: (1) the proportion of net provincial fiscal revenue to total provincial fiscal expenditure, where total provincial public finance expenditure = net provincial government revenue + central transfer payment (2) the proportion of local public finance expenditure to central public finance expenditure in each province (3) the government revenue sharing ratio or marginal sharing ratio in each province (4) the proportion of county (including counties, county-level cities, and municipal districts) public finance expenditure to total provincial public finance expenditure in each province (5) the proportion of combined county-level public finance expenditure to combined county-level own revenue in each province. All five indicators measure fiscal decentralization by examining the division of fiscal resources between superior and subordinate levels of government. In contrast, all empirical studies that measure fiscal decentralization in terms of government revenue and expenditures by province or per capita revenue and expenditures as a proportion of national revenues and expenditures simply respond to the question of how localities, depending on their economic size or level of economic development, may behave in terms of economic growth. In the paper, the first indicator will be used. The first indicator is an internationally prevailing measure of fiscal decentralization and is also consistent with the

relationship between local governments in China, and it is a simple indicator that can be easily manipulated to fulfill the requirements of a large sample test.

2.1.3. The quality of local government

As the environmental governance effectiveness relies on the quality of local government, government quality is used to measure the level of local government services. The paper, following the approach of the paper by Tang Yiqiu and Shi Jie (2019) [9], the paper, therefore, uses principal components analysis to measure local government quality in terms of education, healthcare, culture, and infrastructure and does principal component analysis on the number of general high schools, the number of general primary schools, the number of healthcare institutions, and the number of libraries to obtain the corresponding indicators.

2.1.4. The level of industrialization

In the initial phases of industrialization, the secondary industry accounts for a relatively large proportion. The too rapid development of the industrialization process can lead to economic development at the expense of the environment, while in the later stages of industrialization, the share of the tertiary industry gradually increases, the pressure of environmental pollution begins to decrease and the effectiveness of environmental management begins to increase. Therefore, the level of industrialization has an impact on the effectiveness of environmental protection, and this paper will quote the secondary sector as a proxy for the level of industrialization as a percentage of national GDP.

2.1.5. The growth of the economy

The level of regional economic development brings about effects on the effectiveness of environmental management, and this paper uses regional GDP per capita as an indicator of economic growth.

2.1.6. Descriptive statistics

Table 2 shows the results of the descriptive statistics for the variables in the paper. A general understanding of the data can be obtained.

Table 2. Descriptive statistics results

	mean	sd	p25	p50	p75
ep	2590842	2305618	965298	2144047	3491457
FD	0.50	0.16	0.39	0.45	0.64
transfer	5296784	4010914	2495210	3963804	6895252
GOV	16829.70	13790.02	9024.47	13578.54	20088.40
STR	0.46	0.08	0.41	0.47	0.52
ln_rjgdp	0.43	0.67	-0.11	0.40	0.90

Table 3 reports the statistical results of the correlation coefficients, which indicate that there is no significant multicollinearity between the variables.

Table 3. Correlation coefficients

	FD	ln_trasfer	GOV	STR	ln_rjgdp
FD	1.0000	-0.0974	-0.0426	0.2030	0.6387
ln_trasfer	-0.0974	1.0000	0.6482	0.4297	0.3951
GOV	-0.0426	0.6482	1.0000	0.3072	0.0714
STR	0.2030	0.4297	0.3072	1.0000	0.3782
ln_rjgdp	0.6387	0.3951	0.0714	0.3782	1.0000

2.2. Study of the impact of incorporating environmental protection into KPIs

2.2.1. The changes in KPI

In 2005, the State Council issued the Decision on Implementing the Scientific Outlook on Development and Strengthening Environmental Protection, in which it was clearly stated that environmental protection indicators should be included in the ranking assessment of local political leaders and the results should be used as one of the bases for appointing, rewarding and punishing local officials. The year 2005 marked the beginning of the environmental protection performance assessment system for local government leaders in China. Accordingly, the paper sets 2005 as the year of policy implementation and sets $treat \times post$ as the interaction term. The variable $treat \times post$ is obtained by whether the policy shock variable is received ($treat$) and the two variable scores of 2004 and beyond

(post). That is, a treat*post of 1 is subject to two conditions, one being that the KPI has changed and the other being that the environmental effectiveness variable is in 2005 and later.

2.2.2. DID models

$$\ln_ep_{it} = \beta_0 + \beta_1 \times FD_{it} + \beta_2 \times \ln_transfer_{it} + \beta_3 \times fd_transfer_{it} + \beta_4 \times GOV_{it} + \beta_5 \times STR_{it} + \beta_6 \times \ln_rjgdp_{it} + \beta_7 \times treat_i \times post_t + \mu_i + v_t + \varepsilon_{it} \quad (2)$$

μ_i indicates individual effects, v_t indicates time effect. The variable definitions follow the variable explanation in 2.1.

3. Results and Discussion

3.1. Results of regions with a high impact of fiscal decentralization on environmental protection

The main results of the panel data regressions are reported in Table 4. Column (1) has environmental effectiveness as the explanatory variable and only the fiscal decentralization is included in the regression. The results indicate that the coefficient of fiscal decentralization of regions is significant at the 5% level. Based on the structure of Zhou Li's (2018) [10] study indicating that there is an impact of fiscal decentralization on environmental protection expenditure, the regression results in column (2) of the paper with the inclusion of transfer payments as a control variable are therefore presented. As the results indicate, for fiscal decentralization the coefficient is significant at the 1% level. Column (3) is based on the previous regressions with the addition of government quality. Government quality as a measure of the level of local government is used. The level of local government affects the efficiency of environmental governance. The results indicated that the coefficient on fiscal decentralization is significant at the 1% level. Column (4) adds the level of industrialization in each region. As the secondary industry accounted for a larger share of the total industry during the period 2001-2010. Since the secondary industry brings in more industrial pollution, the level of industrialization in each region affects the level of environmental pollution to some extent. Column (5) adds GDP per capita, which is used to measure the economic development of each region. The results continue to demonstrate the effect of fiscal decentralization on the effectiveness of environmental protection with a significance level of 5%.

Table 4. Impact of fiscal decentralization on environmental effectiveness

variables	(1) ln_ep	(2) ln_ep	(3) ln_ep	(4) ln_ep	(5) ln_ep
FD	1.439** (0.668)	12.74*** (4.030)	13.24*** (4.066)	9.467** (4.244)	9.496** (4.262)
ln_transfer		0.727*** (0.124)	0.718*** (0.125)	0.493*** (0.148)	0.483*** (0.183)
fd_transfer		-0.698*** (0.255)	-0.725*** (0.257)	-0.498* (0.267)	-0.502* (0.270)
GOV			3.11e-06 (3.36e-06)	4.51e-06 (3.36e-06)	4.49e-06 (3.37e-06)
STR				2.447*** (0.892)	2.401** (1.006)
ln_rjgdp					0.0185 (0.187)
Constant	13.65*** (0.338)	2.234 (1.970)	2.286 (1.971)	4.716** (2.139)	4.905* (2.871)
Observations	290	290	290	290	290
R-squared	0.018	0.363	0.365	0.383	0.383

*** p<0.01, ** p<0.05, * p<0.1

Based on the regression results, the coefficients obtained from the regression of the panel data are used in the paper as an assessment of the effectiveness of fiscal decentralization on environmental protection (Table 5). Table 5 presents each province's coefficient in front of the indicators of fiscal decentralization obtained from the regression as the environmental impact coefficient. The coefficient indicates to what extent each one-unit increase in fiscal decentralization has an impact on environmental governance. Fiscal decentralization is compared across provinces to filter out areas with a greater impact, i.e. the greater the impact coefficient, the greater the degree of impact of fiscal decentralization on environmental governance in that area. By selecting the provinces with the highest impact as the subjects of the DID model, the impact of the change in performance assessment indicators can be more clearly seen. The robustness test below will give the results of the study without screening, confirming that the impact of the change in the performance appraisal indicator still exists, but with a significance of 10%. This paper selects the top 50% of regions as the more

influential regions, i.e., the 15 regions of Beijing, Ningxia, Gansu, Xinjiang, Tianjin, Guizhou, Yunnan, and Fujian, Hebei, Sichuan, Anhui, Shanxi, Hainan, Hunan and Chongqing for further research.

Table 5. The extent to which fiscal decentralization has affected the effectiveness of environmental protection in each province

Region	Influence Coefficient	Region	Influence Coefficient
Guangdong	1245.725	Hunan	-54.68605
Shanghai	873.2519	Hainan	-57.24306
Jiangsu	263.2096	Shanxi	-65.49371
Jiling	178.754	Anhui	-73.51543
Heilongjiang	130.4191	Sichuan	-90.78665
Jiangxi	110.9527	Hebei	-105.9165
Guangxi	103.0374	Fujian	-150.6259
Liaoning	80.82842	Yunnan	-313.0178
Shangdong	54.19431	Guizhou	-332.7647
Hubei	39.53067	Tianjin	-418.8879
Shannxi	27.93629	Xinjiang	-653.9444
Inner Mongolia	-19.97679	Gansu	-843.4973
Zhejiang	-25.49155	Ningxia	-993.4358
He Nan	-33.71811	Beijing	-1029.285
Chong Qin	-49.92583		

3.2. The impact of KPI changes

A DID approach was taken to explore the impact of changes in performance appraisal. The regions selected for the first part of the study were used as the experimental group. The reason for this is that for areas where fiscal decentralization has a greater impact on environmental governance, the impact on environmental governance will change significantly when the behavior of local governments changes. The remaining areas where the impact of fiscal decentralization on environmental governance was not significant were used as a control group.

Using the differences-in-differences model, the data were required to satisfy three basic conditions before they could be used. Condition 1: The policy affects the experimental group but does not affect the relevant study variables in the control group. Condition 2: The macro-environment (factors other than the policy) has the same effect on the experimental and control groups during the policy implementation period. Condition 3: The distribution of certain important characteristics of the control and experimental groups is stable and does not change over time. The data requirements given in the paper do not satisfy the first condition; the policy issued by the State Council in 2005 affects all regions, such that the results of the study would appear to be underestimated. However, the assumptions of the original question (that a change in the policy of performance assessment would have an impact on fiscal decentralization would environmental governance) would still hold if the results were still significant despite the underestimation.

A common trend test is also performed before the use of differences-in-differences to show that the control and experimental groups had the same trend before the policy was implemented.

Figure 1. Common trend test

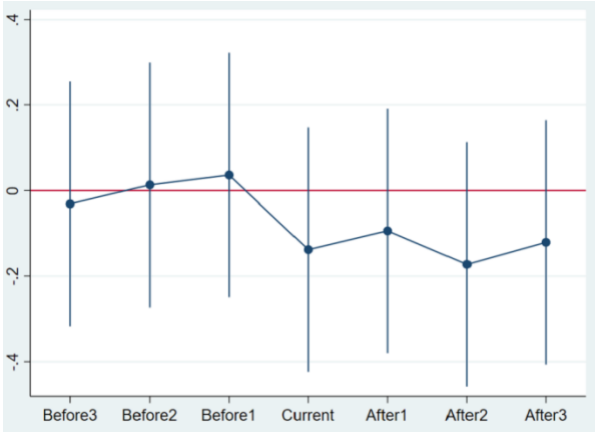


Figure 1 gives the results of the common trend and the results show that the experimental and control groups have a common trend before the policy occurs and are therefore amenable to DID modeling.

The results of the experiment are given in Table 6. A value of 1 for $treat \cdot post$ indicates that a policy change occurred in the area in question, while a post value of 1 indicates that the sample is after 2005

if the value is 0 indicates that the sample is before the year in which the policy occurred, and a treat value of 1 indicates that a policy change will occur in the area. The results in Table 6 show that as the control variables increase, the coefficient on the cross-product term is negatively significant at the 5% level. This indicates that the inclusion of environmental protection as part of the performance appraisal system has motivated local governments and has had a positive impact.

Table 6. Environmental impact of fiscal decentralization under KPI changes

VARIABLES	(1) ln_ep	(2) ln_ep	(3) ln_ep	(4) ln_ep	(5) ln_ep
treat*post	-0.0786 (0.0790)	-0.0771 (0.0752)	-0.107 (0.0774)	-0.122 (0.0768)	-0.156** (0.0767)
post	0.668*** (0.0964)	-0.577** (0.253)	-0.609** (0.253)	-0.510** (0.253)	-1.051*** (0.317)
FDnew	1.534** (0.619)	11.94*** (4.204)	12.40*** (4.202)	8.512* (4.423)	7.614* (4.377)
ln_transfernew		1.085*** (0.171)	1.064*** (0.171)	0.793*** (0.200)	0.679*** (0.201)
fd_transfernew		-0.563** (0.270)	-0.588** (0.270)	-0.354 (0.282)	-0.319 (0.278)
GOVnew			8.08e-06 (5.25e-06)	6.58e-06 (5.22e-06)	3.95e-06 (5.24e-06)
STRnew				2.489** (0.970)	0.778 (1.139)
ln_rjgdpnew					0.684*** (0.247)
Constant	13.30*** (0.319)	-3.590 (2.689)	-3.452 (2.684)	-0.293 (2.926)	2.433 (3.050)
Observations	290	290	290	290	290
R-squared	0.301	0.401	0.407	0.423	0.440

*** p<0.01, ** p<0.05, * p<0.1

3.3. Robustness tests

3.3.1. Placebo test

To avoid the effect of time trends, the paper chooses years other than 2005 for the placebo test. The settings were consistent with the main regression except that the time point was chosen to be a year other than 2007, and the corresponding cross-product terms were not significant. The table below shows

the results of a typical regression (2007). As can be seen from the robustness tests, the findings of this paper are robust.

Table 7. A typical placebo test result

VARIABLES	(1) ln_ep	(2) ln_ep	(3) ln_ep	(4) ln_ep	(5) ln_ep
treat*post	-0.0100 (0.0863)	0.0162 (0.0821)	-0.0105 (0.0849)	-0.0284 (0.0844)	-0.0534 (0.0841)
post	0.633*** (0.0982)	-0.590** (0.254)	-0.611** (0.254)	-0.513** (0.255)	-1.002*** (0.319)
FDnew	1.454** (0.620)	12.87*** (4.220)	13.21*** (4.225)	9.428** (4.455)	8.675* (4.418)
ln_transfernew		1.096*** (0.172)	1.077*** (0.173)	0.813*** (0.202)	0.709*** (0.204)
fd_transfernew		-0.631** (0.271)	-0.649** (0.271)	-0.422 (0.284)	-0.395 (0.281)
GOVnew			6.44e-06 (5.28e-06)	5.04e-06 (5.26e-06)	2.53e-06 (5.30e-06)
STRnew				2.402** (0.976)	0.842 (1.147)
ln_rjgdpnew					0.622**
Constant	13.34*** (0.320)	-3.710 (2.700)	-3.566 (2.700)	-0.492 (2.950)	2.002 (3.082)
Observations	290	290	290	290	290
Number of ids	29	29	29	29	29

*** p<0.01, ** p<0.05, * p<0.1

3.3.2. Different measurements of fiscal decentralization

Based on Zhang Guang's (2011) [15] five indicators of fiscal decentralization, the second one is chosen as part of the robustness test, and the indicator of fiscal decentralization = the proportion of local public finance expenditure to central public finance expenditure in each province, which was used in the article by Jin Hehui and Qian Yingyi and Weingast (2005) [16]. The data for this indicator are readily available

from official statistics and the data obtained are somewhat accurate. Table 8 reports the results of the panel regressions, with the regions with larger coefficients in front of fiscal decentralization selected as the experimental group.

Table 8. Impacts under the second indicator of fiscal decentralization

VARIABLES	(1) ln_ep	(2) ln_ep	(3) ln_ep	(4) ln_ep	(5) ln_ep
FD	50.40*** (8.389)	10.17 (8.672)	10.91 (8.757)	-0.199 (9.185)	-0.151 (9.248)
ln_transfernew		0.325*** (0.0446)	0.306*** (0.0531)	0.192*** (0.0620)	0.199 (0.132)
fd_transfernew		0.103*** (0.0348)	0.105*** (0.0351)	0.0919*** (0.0346)	0.0930** (0.0404)
GOVnew			2.24e-06 (3.42e-06)	3.95e-06 (3.39e-06)	3.96e-06 (3.40e-06)
STRnew				3.098*** (0.912)	3.120*** (1.003)
ln_rjgdpnew					-0.0101 (0.190)
Constant	13.05*** (0.222)	8.366*** (0.554)	8.580*** (0.643)	9.259*** (0.661)	9.149*** (2.174)
Observations	290	290	290	290	290
R-squared	0.122	0.341	0.343	0.371	0.371
Number of ids	29	29	29	29	29

*** p<0.01, ** p<0.05, * p<0.1

Table 9 demonstrates the impact of fiscal decentralization on environmental protection under the effect of a policy shock from a change in performance appraisal. The test results found to be insignificant indicate that the policy shock effect of performance appraisal changes is small or even non-existent. Zhang Guang (2011) [15] points out that using provincial government expenditure as an indicator of central government expenditure defaults policy subsidies to central government expenditure, but not all policy subsidies are centrally sourced, and also officially published data do not report policy subsidies

every year. It is therefore possible that the results may be skewed. The first indicator of fiscal decentralization used in this paper avoids this problem.

Table 9. Financial decentralization indicator changes results for DID

VARIABLES	(1) ln_ep	(2) ln_ep	(3) ln_ep	(4) ln_ep	(5) ln_ep
treat*post	-0.0605 (0.0784)	0.0198 (0.0756)	0.0105 (0.0765)	0.0544 (0.0760)	0.0645 (0.0750)
post	0.604*** (0.101)	-0.732*** (0.276)	-0.746*** (0.277)	-0.676** (0.272)	-1.318*** (0.350)
FD	19.83** (8.894)	5.154 (9.207)	5.103 (9.214)	-4.757 (9.474)	-13.20 (9.796)
ln_transfernew		0.775*** (0.161)	0.754*** (0.164)	0.589*** (0.167)	0.533*** (0.166)
fd_transfernew		0.183*** (0.0417)	0.183*** (0.0418)	0.170*** (0.0411)	0.145*** (0.0415)
GOVnew			4.29e-06 (5.23e-06)	2.24e-06 (5.15e-06)	-1.29e-06 (5.23e-06)
STRnew				3.350*** (0.983)	1.703 (1.128)
ln_rjgdpnew					0.739*** (0.259)
Constant	13.58*** (0.231)	1.341 (2.395)	1.597 (2.417)	2.940 (2.399)	5.029** (2.476)
Observations	290	290	290	290	290
Number of ids	29	29	29	29	29

*** p<0.01, ** p<0.05, * p<0.1

3.3.3. Selection of regions with larger absolute values of fiscal decentralization coefficients

A positive coefficient on the fiscal decentralization coefficient indicates that the greater the degree of fiscal decentralization, the more effective the environmental governance, while a negative coefficient can be seen as a low degree of positive fiscal decentralization. In the previous section, the effect of policy shocks was studied in the first half of the region with a larger positive term, and the results were

significant at the 5% level. Here, the results were found to be significant at the 1% level when choosing regions with larger absolute values of fiscal decentralization, i.e. whether to ignore the positive or negative effect of fiscal decentralization (Table 10). Table 10 illustrates that the impact of fiscal decentralization on environmental effectiveness as a result of KPI changes is more pronounced. The negative coefficient of treat*post in the results not treated in absolute terms indicates that the more environmental governance is affected by fiscal decentralization the less the region receives the policy impact of the KPI change. For areas where environmental governance is less affected by fiscal decentralization, the greater the impact of the KPI change. In contrast, one of the reasons why the coefficient before HH is negative when the data is treated in absolute terms is that the areas chosen are in two extreme directions, with data on one side being that fiscal decentralization has a positive impact on environmental governance and is influenced by policy to a greater extent. On the other hand, fiscal decentralization harms environmental governance and is less influenced by policy, so the coefficient before treat*post may be positive when we applied the DID model to two regions.

Table 10. Selecting the larger absolute value of the fiscal decentralization factor for the DID results

VARIABLES	(1) ln_ep	(2) ln_ep	(3) ln_ep	(4) ln_ep	(5) ln_ep
treat*post	0.0519 (0.0799)	0.128* (0.0755)	0.128* (0.0754)	0.185** (0.0766)	0.266*** (0.0787)
post	0.601*** (0.0967)	-0.737*** (0.267)	-0.764*** (0.268)	-0.714*** (0.264)	-1.481*** (0.343)
FDnew	1.441** (0.613)	12.22*** (4.132)	12.80*** (4.154)	8.086* (4.382)	6.676 (4.310)
ln_transfernew		1.130*** (0.172)	1.116*** (0.172)	0.811*** (0.198)	0.673*** (0.198)
fd_transfernew		-0.582** (0.264)	-0.619** (0.266)	-0.334 (0.278)	-0.274 (0.273)
GOVnew			6.26e-06 (5.07e-06)	4.18e-06 (5.04e-06)	-7.03e-09 (5.09e-06)
STRnew				2.971*** (0.992)	1.042 (1.124)
Constant	13.35*** (0.316)	-4.232 (2.699)	-4.149 (2.697)	-0.651 (2.900)	2.642 (2.999)

Observations	290	290	290	290	290
R-squared	0.299	0.406	0.409	0.430	0.456

*** p<0.01, ** p<0.05, * p<0.1

4. Conclusions

The paper aims to investigate the extent to which government investment in environmental management is affected by the gradual shift from a "GDP-oriented" to an "ecologically oriented" performance assessment based on fiscal decentralization, using fixed effects and DID models to empirically investigate the impact of incorporating environmental protection into performance assessment. The study uses both fixed-effects and DID models to empirically investigate the impact of incorporating environmental performance into performance appraisal on local government investment in environmental protection. The results show that regardless of the degree of autonomy of local governments, once the criteria for promotion bids are changed, government officials will make corresponding changes. However, the impact was greater in areas with a high degree of fiscal decentralization. This suggests that the implementation of KPI policies to increase ecological governance has had a positive impact on government investment in ecology, and also reflects that local government officials are rational and that KPIs have an incentive effect on government officials.

Variations in KPIs created powerful incentives for government officials indicating another issue that promotion tournaments come with the quantification of assessment indicators. Some government responsibilities are not easily quantifiable, and for those parts that are not easily quantifiable, it is relatively simple for government officials to neglect, which can have a negative influence on society and the country. Some of the problems that China has faced since the reform and opening up are partly due to the effects of the incentive system itself, for example, sloppy economic growth, environmental pollution, and so on. Thus, changing the original single GDP-based performance appraisal index can help improve the short-term government officials' behaviors, which in turn can reduce the incentive system itself the negative influence.

Consequently, there is a necessity to quantify the responsibilities of the government and to make the assessment criteria for promotion to the championship multi-dimensional to better benefit the people in the future. Meanwhile, the central and local governments need to reasonably divide the degree of fiscal decentralization and environmental matters, give local governments certain taxation powers and expenditure responsibilities, and allow them to decide on the scale and structure of budgetary expenditure, so that local governments at the grassroots level can freely choose the type of policies they need and actively participate in social management, with the result that local governments can provide more and better services and improve. As a consequence, local governments will be able to provide more and better services and enhance the level of local pollution control.

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MS0083: Managerial Cognitions in the Digital Era

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Managerial Cognitions in the Digital Era

Abstract

The impact of digitisation on globalisation has been apparent, leading to a faster and more pervasive internationalisation process. Studies suggest that, due to the present state of globalisation and technological improvements, several firms begin exporting within a few years of being established. Therefore, for enterprises to attain global competitiveness, managers must possess characteristics that demonstrate a global mindset, especially considering the growing importance of emerging markets in global competition. This research utilises the upper echelons viewpoint to investigate the cognitive skills and conduct of Chinese managers, which affect the link between digital technology adoption (DTA) and international performance. The research seeks to expand and enhance the concept of competitive advantage in the international business environment by illustrating how Chinese managers use a composition strategy to create unique advantages for their firms or reduce competitive disadvantages while expanding internationally after entering a foreign market. This study aims to make significant empirical and theoretical contributions to the area of International Business research. This allows businesses with little resources to differentiate themselves from organisations with abundant resources, particularly in industries with unclear borders. To get a deeper understanding of the actions and decisions made by Chinese managers, this research utilises the concepts of global mindset and perceived psychic distance (PPD) to analyse the connection between DTA (Digital Technology Adoption) and the performance of the organisation.



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MS0084: Enhancing Customer Experience and Innovation Capabilities in Enterprise Digital Transformation Strategies

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Enhancing customer experience and innovation capabilities in enterprise digital transformation strategies

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Abstract: This research aims to investigate the impact of corporate digital transformation capability on business performance, including market growth and operational performance. Based on relevant literature, this research posits that in the era of digital transformation, it is critical for enterprises to maintain a unique brand advantage in the consumer buying process with multiple choices and to successfully transform through business model innovation to continue market share expansions in the digital wave. Therefore, this research chooses brand innovation and business model innovation as the intermediary variables and enterprises' customer experience capabilities as independent variables in the research model. As for the data collection and analysis of network sub-cases, most companies still focus on introducing and applying digital technology, particularly agility. In addition, some companies have already entered the planning and implementation stage of customer experience design. Enterprises from different industries have different focuses; the financial industry can be said to be a pioneer in the continuous innovation of customer experience business models. The purpose of the case study is to understand managers' evaluations for firm's customer experience capabilities (e.g., experience design

capability, customer intelligence capability, and customer engagement capability), brand innovation, business model innovation, and performance. We offer two case discussions. Both cases have different progress and challenges in the context of digital transformation. Case A, a B2B technology company primarily focusing on digital optimization, has yet to achieve customer experience design. Case A recognizes the importance of incorporating digital transformation factors into the future customer experience. On the other hand, Case B claims to have reached the digital transformation stage through customer experience design. Case B prioritized enhancing customer experience, fostering innovative business development, and building digital capabilities during its digital transformation journey. They implemented multiple strategies and action plans while also focusing on strengthening organizational capabilities and fostering an agile culture.

Keywords: Digital transformation, brand innovation, business model innovation, customer experience capability, experience design



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MS0086: Building a Green Jobs Economy: Global Implications Emerging from the UK Experience

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Building A Green Jobs Economy: Global Implications Emerging from The UK Experience

Introduction

Comprehending relationships between the contextual effects of government roles vis-à-vis the climate crisis and what they mean for human resource management (HRM) research and practice matters, as 40% of global employment relies on a sustainable environment (Baldry and Hyman, 2021, p.86), and International Labour Organisation (ILO) data shows 1.2 billion jobs depending on nature (Lieuw-Kie-Song, 2021). Here, citizens tend to look to governments as having agency to act on an appropriate scale to reduce carbon emissions (CAST, 2021, p.2). Government action is therefore needed to limit carbon emissions, reduce human deaths arising, combat global climate injustice, and promote social equity for affected groups (Lazzarini, 2021, p.1). Ergo, some experts call for a decent job and a healthy environment to become human rights (Baldry and Hyman, 2021, p.89). The UK political agenda is shaping green job creation, aiming for eco-friendly employment. The country, along with New Zealand, passed legislation requiring net-zero carbon emissions by 2050 (Bushell-Embling, 2020, p.4; GOV.UK, 2020). However, the UK green jobs plan, initially proposed by leader Johnson, faces challenges like marginalized union and employee voices, implementation issues, and a private equity focus.

Literature and framework

This critical analysis addresses literature calls for more studies on regulation and HRM, incorporating context and situating HRM into political contexts (Cooke, 2017; Farndale, Bonache, McDonnell and Kwon, 2023; D’Cruz, Delannon, McCarthy, Kourula, Moon, Spence and Gond, 2021). It uses discourse analysis and conservative political ideology to critique UK government green jobs policy, a unique approach rarely seen in HRM studies. By examining the UK state's role, we contribute to increasing contextualization in research (Lee and Morley, 2021, p.3) and sustainability studies (Howard-Grenville, 2021, p.2). This study explores the role of political conservatism in green job creation in the UK, focusing on the role of the state, individuals, businesses, unions, and labor groups. It aims to reduce the existing literature gap by transferring political theory into the domain of green employment, and argues

that the UK's green jobs plan may lead to ignorance and unchallenged actions, potentially resulting in increased human deaths via increased carbon pollution, and employing conservative political ideas and critical discourse analysis, explores alternative pathways to creating decent green jobs (cf. Sandberg and Tsoukas, 2020). Our aim is to provide a deep understanding of green employment and challenge existing assumptions in it (cf. Cornelissen et al., 2021). This paper critically analyzes Boris Johnson's UK government green jobs plan, focusing on its impact on ecological and labour standards post-Brexit (Goodwin, 2014, p.vii). It discusses the implications of compromised standards and alternative visions of green job creation. The paper argues that Johnson's plan marginalizes trade union and employee interests, is impractical, and relies on private equity funding, which could be continued by new Labour leader Sir Keir Starmer.

Method and results

This study employed discourse analysis to scrutinize the meanings generated and dominant through language-in-use in British leader and government speeches, press releases, websites, and media coverage (cf. Oswick, 2012, p.483). It undertook a 'historical trawl' to collect documentary evidence and critical discourse analysis to explore the socio-political context of green job texts by recent British conservative political leaders (cf. Fairclough, 1995; Lee, 2021, p.9). Our analysis focuses on Johnson's original green jobs plan, acknowledging that it represents the interests of the UK state and only focuses on elite voices in their government.

British Conservative leader David Cameron's coalition government (2010-2015) saw him state that: "we've got a real opportunity to drive the green economy, to have green jobs, green growth, and make sure that we have our share of the industries of the future". He added that: "I said I would aim to have *the greenest government ever*, and *this is exactly what we have*, but we need to make renewable energy financially sustainable" (Cameron, 2010 in Carrington, 2012, pp.1-2, our emphasis). Later, the British newspaper *The Sun* leaked a senior UK conservative party source saying that Cameron wanted to "*get rid of all the green crap*", i.e. environmental regulations (a quote which he never denied), and Cameron adding that "we're going all out for shale gas" (in Bennett, 2016, p.3). Subsequently, solar companies employing thousands of British-based workers collapsed, as the Cameron-led government abolished energy efficiency schemes and eliminated regulations decarbonizing new homes (Bennett, 2016, p.3).

UK Conservative leader Theresa May's successor administration (2016-2019) saw her presiding over cuts to the solar industry, leading to approximately 12,000 British-based green job losses (Greenpeace, 2016, p.1), and May leaving out the environment in her Brexit negotiation strategy, which exacerbated concerns Britain could become a post-Brexit 'pollution centre' (Burns, 2017, p.1). Within this political backdrop (above), the UK Conservative leader Boris Johnson (2019 onwards) set out his own, new green jobs policy "my ten-point plan" in his highly ambitious 'green industrial revolution' scheme (Johnson, 2020, p.1, our emphasis). In it, he detailed policies to 'mobilise £12 billion of government investment each year to create and support up to 250,000 highly-skilled green jobs', and 'spur over three times as much private sector investment by 2030' (GOV.UK, 2020, p.1). He added a 'Jet zero' consultation in mid-2021, which committed British aviation 'to a net-zero emissions target by 2050' (GOV.UK, 2021, pp.3-5). However, his conservative UK government's arithmetic appears odd, as their green jobs plan (above) only reveals definite commitments to help, support, train, and/or create up to 120,000 British-based green jobs, rather than the 250,000 ones they earlier stated (*op cit.*). Tellingly for such conservative politicians, official UK statistics show 'no measurable increase in environment-based jobs in recent years' (Harrabin, 2021, p.2).

Discussion

Particular fault-lines of the British green jobs plan above include issues of: business support, integration and measures; coordination and enactment; and organising, preparation, and diversity, which we now detail. On business support, integration, and measures, COP 26's Alok Sharma MP says 'we can only meet targets with business behind us', and the UK Public Accounts Committee state that 'at present, there is no coordinated plan with clear milestones towards achieving the target, and little sign that government understands how to get there' (Sharma, 2021, p.2; Sachdeva, 2021, p.3). Moreover, conservative UK government texts and speeches (above) suggest that new technologies might solve the climate crisis, whereas informed experts warn of complexity and a need for action 'right across society and the economy' (Harrabin, 2020, p.2). For example, existing data suggest that refurbishing homes with insulation may create 'four times more jobs' than UK transport projects (Harrabin, 2020c, p.4). Further, Wells at Cardiff University states: "repairing and maintaining electric cars requires new skills - I'm not sure there are enough people trained up", and Johnson excluded any *job losses*, as 'extra [green]

jobs are coming into existence largely in response to legislation that will destroy other jobs' (in Hannan, 2021, p.1). The green job policies of British conservative politicians over the last decade seem to have delivered only one key achievement – of increased jobs in the wind power sector (Porritt, 2015) – which appears a relatively low return. As such, Britain's green jobs plan may mean it either misses out on new green job creation in such emerging key sectors and/or be disappointed by low job growth in others like hydrogen production. Thus, Johnson's 'green industrial revolution' perhaps sees him embracing ecological employment goals without relevant understanding and means to achieve them, and appears as a 'grand vision' only.

Although UK conservative leaders like Boris Johnson seem to follow Wilson's notion of the 'conservative character', including a belief in rules and a practical approach (his ten-point green plan), they also adopt a characteristically un-conservative fixed goal (of net-zero carbon by 2050) normally associated with utopianism, which shows their credentials as incremental reformers (cf. Goodwin, 2014, pp.161,163, 176). The current British government, therefore, draw on Burke's claim that a state needs some change to survive and conserve itself, as they seek to modernize UK capitalism through workplace greening, which builds upon existing societal 'concerns and traditions' (of the climate crisis), and reinforces existing conservative tensions between 'damaging and acceptable evolutionary change' (Goodwin, 2014, p.166). The new British green jobs plan implicitly accepts a faith in human goodness, i.e. that UK-based firms, workers, and citizens will adopt it, (the opposite of conservative pessimism on human 'weakness, selfishness, and irrationality), which sees them agreeing with Hobbes' liberal suggestion that people require more authoritarian-style government (cf. Goodwin, 2014, pp.168-169). The UK government's green jobs plan under Johnson failed to incorporate ILO terms and ideas, resulting in a missed opportunity for a well-organized transition to a green, sustainable economy, which could add up to 60 million additional, good-quality jobs globally (Poschen, 2015, pp. xix, xx-xxii).

The impact of government policy on green job generation needs further research, institutional theory can help understand institutional environments and sources of variation, alongside alternative theories like neo-institutionalism, political economy, Marxism, post-colonialism, and neo-Schumpeterian perspectives. Future research could explore how political leaders and workplace stakeholders are influenced by the government case on green job creation, and building new green job databases at

country, region, and global levels can help benchmark progress and identify organizational constraints and risks. Scholars could also investigate national government green job policies and their integration into universities' green curricula, and the interpretations and meaning of decent green employment for existing job holders, workers, and employee voices. Future research might benefit from investigating the gender aspects of green job plans and differences within Muslim environmentalism. Recent conservative UK governments have presented British green job creation in a unitarist and already-decided way not stressing the voices of UK-based workers and unions (cf. Lee and Morley, 2021). This study calls for more holistic, new thinking focusing on national, regional, and supranational contexts.

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MS0088: Internationalization of What? The Impact of Firm Status on Offshoring Managers' Private Wealth in Emerging Markets

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Internationalization of What? The Impact of Firm Status on Offshoring Managers'

Private Wealth in Emerging Markets

Abstract

Prior research on internationalization of emerging market firms has predominantly focused on how firms from emerging economies offshore firm assets and capital overseas to capture new opportunities or resources. Meanwhile, an independent research stream in Sociology focuses on how managers offshore their private wealth, which, however is largely ignored by International Business (IB) scholars. This paper bridges these two literature stream by providing exploratory evidence into the antecedents and consequences of offshoring managers' private wealth. We found that firm status serves as an antecedent of offshoring private wealth and private wealth enhances a firm's long-term orientation in business investment, measured by capital expenditure divided by total assets. This study makes important contributions to literature on emerging markets firms' internationalization and on firm status.

Key words: Firm internationalization, firm status, offshoring private wealth, emerging markets.

1. Introduction

A large amount of literature has amassed on emerging markets firms' (EMFs) internationalization in the past few decades (for recent review, see Deng, 2012; Jormanainen & Koveshnikov, 2012; Luo & Zhang, 2016; Ramamurti & Hillemann, 2018). A key insight is that as EMFs seek for overseas unique opportunities and critical resources, and develop capabilities that are otherwise unavailable in their home markets, managers of EMFs offshore company assets, capital and resources to establish presence in other host markets (Buckley et al., 2018). Such offshoring thus has significant implications for EMFs' performance and survival (Luo & Zhang, 2016).

At the same time, however, a growing body of research on wealth accumulation and perpetuation in Sociology examines how large wealth owners, including social elites such as politicians and firm managers, maintain their own wealth (Beckert, 2022; Harrington, 2016; Killewald, Pfeffer, & Schachner, 2017). One research stream investigates the effect of private wealth on one's own career outcomes such as self-employment (Fairlie & Krashinsky, 2012) or health outcomes including physical health (Attanasio & Hoynes, 2000) and mortality (Hurd & Kapteyn, 2003). An important mechanism for wealth preservation is that private wealth owners from emerging economies tend to offshore their assets and hide them overseas in order to avoid the institutional void and political risks that inherently exist in their home emerging markets (Harpaz, 2022; Harrington, 2016). In contrast, firms managers from developed economies often do not need to export private wealth overseas since institutions are more developed and political risks are lower back in their home countries¹ (Ding, 2000; Harrington, 2016).

Yet, these two research streams grow independent of each other and this paper bridges these two and propose new insights into internationalization literature.

2. THEORY AND HYPOTHESES

While such investigation is almost absent in the space of International Business (IB) (cf. Buckley et al., 2018), it is consistent with institutional escapism perspective, which suggests that EMFs internationalize as a result of institutional weaknesses and resource constraints in their home countries (Du & Zhao, 2023). This limits their acquisition of capabilities and resources. EMFs thus offshore strategic assets and conduct outward FDI to cope with the misalignments between their own needs and the underdeveloped institutions in the home countries (Shi et al., 2017; Witt & Lewin, 2007). However, institutional escapism perspective does not touch upon the notion of managers' desire to preserve their

¹ Firms managers from developed economies, however, do sometimes export their private wealth overseas to tax havens to reduce tax that they should pay. But that is not the focus of this paper.

private wealth and the impact such preservation has on firm outcomes.

Preserving firm managers' private wealth via offshoring has important effect on firm outcomes but the impact is not consequential. On one hand, research on wealth preservation suggests that such offshoring helps lengthen wealth owners' temporal horizon and develop long-term orientation (Beckert, 2022). Long-term orientation is instrumental to firm long-term value as managers are notoriously labelled as short-term opportunist (e.g., Souder & Bromiley, 2012). On the other hand, offshoring wealth can result in serious legal consequences as many firm managers convert state assets into their own private holding and transfer such wealth overseas. For instance, as Buckley et al. (2018, p.15) indicated, " The transfer of state assets into private holdings – often in offshore locations (Ding, 2000; Pei, 2016) – suggests that family members of high status individuals in China use this mechanism to export wealth, but forensic investigation of this is difficult (Barboza & LaFraniere, 2012). Research suggests that some government officials have used tax havens to hide illicitly gained wealth while private individuals have moved wealth to offshore havens to safeguard it from the Chinese government (Gunter, 2017)." Thus, once such misconduct is identified by the government, it can create legal disputes for firms or even jeopardize the firm's survival. Thus, while firm international involvement is important, managers' private wealth preservation also has significant consequences for their own firms.

In this paper, we identify firm status as the antecedent of offshoring managers' private wealth. Firm status refers to the hierarchical position or rank a firm occupies within its industry or market (Jensen, Kim, & Kim, 2011), functions as a signal that helps external audiences evaluate the quality of firms and their products (Podolny, 2001). Although it is a sociological construct, it has gained increasing attention from IB scholars in the past few years (e.g., Chae, Song, & Lange, 2021). To illustrate, as an invaluable social assets, for instance, product status in a foreign country has been found to enhance

domestic market performance (Chae et al., 2021).

We first argue that since firm status increases a firm's visibility (Jensen, 2006) and the state in emerging economies has strong control over firm behaviors (Peng & Luo, 2000), firms with high status are more subject to government intervention and rent-seeking, making their managers more sensitive to the political risks. As a result, managers are more likely to offshore their private wealth. We then argue that managers offshoring their private wealth enhances their long-term orientation as preserving their wealth helps them to plan for the long-run and develop higher level of long-term orientation. This results in more long-term investment for their own firms.

Hypothesis 1, Firms status is positively related to offshoring managers' private wealth.

Hypothesis 2, Offshoring managers' private wealth is positively related to a firm's long-term investment.

3. Method and Results

We use a sample of Chinese firms listed on the Shanghai and Shenzhen stock exchanges to test our hypotheses. The China Stock Market and Accounting Research (CSMAR) database provides data on the firms listed on the Shanghai and Shenzhen stock exchanges.

Measures. Firm status. We measure status by the amount of sell-side security analyst coverage, scaled by the focal analyst's industry expertise (Wang & Jensen, 2019). To obtain the industry expertise of security analysts, we first counted the number of firms that each analyst covers in each three-digit Standard Industrial Classification industry. The analyst with the largest number of firms in a given industry gets a score of one and the expertise of other analysts is calculated by dividing their covered number of firms in a given industry by the number of firms covered by the analyst covering the highest number of firms in that industry. As more than one analyst might cover a focal firm, its

status is the aggregate of the industry expertise scores of the analysts that cover that firm.

Offshoring managers' private wealth. As offshoring private wealth involves private transactions between managers themselves and overseas banks, it is not plausible to obtain the specific number. However, we adopted an unobtrusive residual approach to capture the statistical artifact of the total amount of offshoring managers' private wealth. To compile the data, we employed complicated machine learning approach. Due to the very limited space here, we are unable to cover further details but we are happy to clarify during the final presentation.

Firm long-term Investment. We capture a firm's long-term investment by using capital expenditure divided by total assets, consistent with Martin et al. (2016).

Control Variables. We included firm size, state ownership, industry average of offshoring managers' private wealth, market performance (Tobin's Q), return on assets (ROA), supervisors representation, CEO duality as our control variables. We employed fixed-effect model with robust standard errors. But the results are also robust if we employ random-effect model. Our independent variables predicting offshoring private wealth are at time T while offshoring private wealth is at time T+1. Our independent variables predicting long-term investment are at time T+1 and long-term investment is at time T+2.

Results. We found significant positive impact of firm status on offshoring private wealth ($b=0.023$, $p<0.01$) and significant positive effect of offshoring private wealth on firm long-term investment ($b=0.001$, $p<0.01$). Tables are available upon request. We did not put tables below due to limited space. We found support for both our hypotheses.

We did several robustness analyses. For instance, we performed Impact Threshold for Confounding variables test. The results showed that to invalidate the inference 29.37% of the estimate

would have to be due to bias; to invalidate the inference 29.37% (4213) cases would have to be replaced with cases for which there is an effect of 0. This indicates around 30% of the total observations, which is unlikely. In addition, as argued above, managers' offshoring private wealth might violate the law and involve laundering state assets. We, however, did not find significant result of private wealth offshoring on firm misconduct.

4. Discussion and Conclusion.

Our paper contributes to literature on emerging firms' internationalization by proposing an important construct, offshoring managers' private wealth, and suggesting it has important consequences on firm outcomes such as long-term investment. In other words, it is insufficient to just look at offshoring firm capital and assets, but offshoring managers' private wealth is equally important. In addition, prior research on firms status has predominantly focused on managers' career outcomes but ignored their perpetuation of private wealth. Our study broadens the managerial-level outcomes of firms status.

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MS0089: Understanding the Role of Consumption Values of AI Service Robots on Customer-robot Interactions

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Understanding the role of consumption values of AI service robots on customer-robot interactions

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Extended Abstract

Service robots are increasingly being utilized in service contexts. However, studies on the actual value created by service robots and their impact on customers' service experiences remain limited. This research draws on the theory of consumption values to identify a series of values—functional, conditional, social, emotional, and epistemic—created by service robots and their impact on customer satisfaction, which, in turn, further influences customers' behavioral intentions.

Keyword: Service robots, consumption values, customer-robot interactions

1. Introduction

Owing to the advancement of artificial intelligence (AI) technologies, service robots have been increasingly used in complex human environments (Shin & Jeong, 2020; Xiao & Kumar, 2021), including hospitality and tourism areas such as hotels, restaurants, airports, museums, and tourist attractions (Huang et al., 2021). It is forecasted that the global service robots market is expanding significantly from USD 41.5 billion in 2023 to USD 84.8 billion by 2028, representing a strong compound annual growth rate of 15.4% over the period from 2023 to 2028 (Markets & Markets, 2023). The support of AI-powered service robots has revolutionized the nature of consumer experiences (Chuah & Yu, 2021). Hospitality and tourism businesses have been expected to gain and sustain a competitive

advantage with the usage of service robots due to the provided consistent, accurate, and efficient services (Huang et al., 2021). However, some practitioners have expressed concerns that the excessive usage of robots in service interactions may undermine the humanist hospitality and negatively impact customer experience (Fust'e-Forn'e, 2021). Even in certain cases, the purpose of adopting service robots has been primarily for publicity, with limited attention to the real performance of the machines (Qiu et al., 2020). The expected enhanced service functions and level of fun and curiosity provided by service robots do contribute to positive impressions on the adoption of service robots (McCartney & McCartney, 2020), but the actual perceived value of service robots from customers' perspective on customer-robot interactions remain unexplored.

Customer-perceived value is defined as a customer's trade-off between benefits and costs (Cronin, 2016; Kleijnen et al., 2007), referring to a customer's calculation of give and get (Zeithaml et al., 2020). The customer perceived value of service robots comes not just from the machinery functions, but from the services they deliver during the customer-robot interactions, which is known as value-in-use (Leroi-Werelds et al., 2014). Unfortunately, existing research rarely empirically examine the real-world value created by service robots during customer-robot interactions (Kaartemo & Helkkula, 2018). Thus, this research draws on the theory of consumption values (Sheth et al., 1991) to explore how the multiple values created by service robots contribute to customer satisfaction which in turn further enhances customers' behavioral intentions.

2. Literature and Framework

2.1. Service robots

Service robots is defined as 'system-based autonomous and adaptable interfaces that interact, communicate and deliver service to an organization's customers.' (Wirtz et al., 2018, p. 909). Unlike traditional self-service technologies, customers mostly engage with service robots in a manner similar to their interactions with service employees. (Wirtz et al., 2021). Service robots are undoubtedly shaping customers' service experiences by significantly influencing how work gets done and who performs it (Wilson & Daugherty, 2018). Therefore, understanding the value of service robots from the customers' perspective is critical for gaining insight into customer-robot interactions.

The existing research on service robots is conceptual in nature (Filieri et al., 2022; Lu et al., 2020; Wirtz

et al., 2021). Xiao and Kumar (2021) developed a framework detailing the concept of the degree of robotics adoption (DRA) and identifying key antecedents, such as employee and customer acceptance of robots of DRA, and exploring multiple sequential outcomes of DRA, including service quality, customer long-term performance, and customer engagement. Additionally, they examined how the firm's nature (Business-to-Consumer vs. Business-to-Business, or B2C vs. B2B), service characteristics (utilitarian vs. hedonic), and brand positioning (low equity vs. high equity) may influence the relationship between DRA and service quality. Ivanov and Webster (2020) critically assessed contemporary research on the economic dimensions of service robots in the tourism sector and examines their implications for tourism economics across three key areas: tourism supply, tourism demand, and destination management. By doing so, the paper explores the economic impact of service robots from the viewpoints of tourism businesses, tourists, and entire destinations. Robinson et al. (2020) proposed an advanced service encounter framework, introducing the concepts of counterfeit service, interspecific service (AI-to-human), and interAI service (AI-to-AI) and presented a research agenda centered on the implementation of AI in dyadic service exchanges. Belanche et al. (2020) developed a three-part framework—comprising robot design, customer features, and service encounter characteristics, identifying key factors within each category that need to be analyzed collectively to determine their optimal adaptation to different service components. Such framework and the final research questions provide a research agenda to guide scholars and assist practitioners in successfully implementing service robots.

The limited empirical studies have primarily focus on two areas. The first is the factors influencing adoption and customer acceptance in service robots (Lu et al., 2019; Shin and Jeong, 2020; Pillai and Sivathanu, 2020). The factors include robot design, perceived intelligence, perceived usefulness and ease of use. The other focuses on Human-Robot Interaction (HRI). Research highlights the importance of HRI in shaping customer attitudes (Tung and Law, 2017; Ho et al., 2021). Attributes of HRI such as emotional and functional elements (Hlee et al., 2022; Chuah and Yu, 2021) are examined to understand customers' attitudes towards service robots. The human-like emotional responses are associated with positive interactions (Chuah and Yu, 2021). Mostly, customers tend to prefer robots that can understand and respond to social cues.

Studies exploring value creation of service robot remain scarce. This research aims to focus on customer-robot interaction process by examining the consumption value created by service robots and its impact on customers' satisfaction and behavior intention.

2.2. The theory of consumption values

The theory of consumption values (Sheih et al., 1991) identify five consumption values influencing consumer choice behavior. The five values are functional value, conditional value, social value, emotional value and epistemic value. Consumers' decision may be influenced by one or all of the mentioned values. The functional value is defined as 'the perceived utility acquired from an alternative's capacity for functional, utilitarian, or physical performance'. Social value refers to 'the perceived utility acquired from an alternative's association with one or more specific social groups'. Emotional value is defined as 'the perceived utility acquired from an alternative's capacity to arouse feelings or affective states'. Epistemic value refers to 'the perceived utility acquired from an alternative's capacity to arouse curiosity, provide novelty, and/or satisfy a desire for knowledge'. Conditional value is defined as 'the perceived utility acquired by an alternative as the result of the specific situation or set of circumstances facing the choice maker'.

This research attempts to examine the impact of the perceived five consumption values of service robots on customers' satisfaction and further affect customers' behavior intention. The proposed figure is showed as below figure 1.

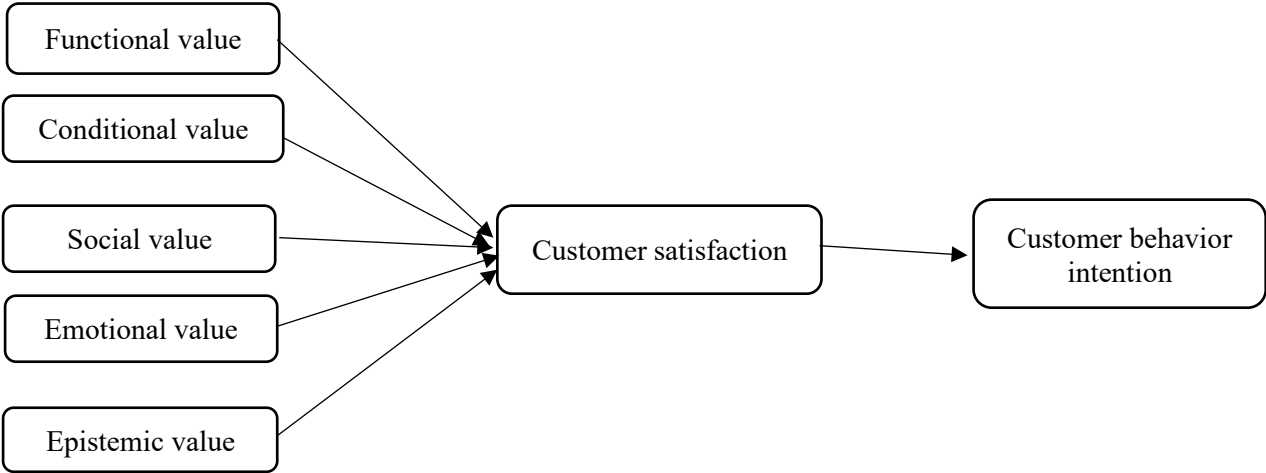


Figure 1. Hypothesized model.

3. Methods

This research plans to collect questionnaire data from hotel customers in mainland China to test the hypothesized model. Around 300 customers who have ever stay in hotels which adopted service robots in the passed 12 months will be recruited to fill in the questionnaire. Quantitative techniques, such as confirmatory factor analysis (CFA), correlation and structural equation modeling (SEM) will be used to perform data analyses.

4. Discussion

This research will make several contributions to the existing literature on service robots. First, it will enhance empirical studies by identifying specific values created by service robots that influence customers' behavioral intentions. Current research offers limited insights into how these values affect customer behavior (Kartemo & Helkkula, 2018). Second, this study will provide insights into customer-robot interaction by emphasizing experiential values, such as social and emotional values, that service robots may create simultaneously. This complements the overall understanding of service robot usage during customer-robot interactions. Third, the research will extend the theory of consumption values by applying it in the context of the hotel industry.

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MS0090: The Prohibitive Voice Dilemma: When Direct Prohibitive Voice Backfires and How LMX Saves It?

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The Prohibitive Voice Dilemma: When Direct Prohibitive Voice Backfires and How LMX Saves It?

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Extended Abstract

This study investigates the relationship between direct prohibitive voice and managerial voice endorsement. Despite the enhanced communication clarity, direct prohibitive voice may have a backlash effect on supervisors' endorsement. Drawing on attribution theory, we propose that direct prohibitive voice negatively affects voice endorsement through increased attributions of competence threat and decreased attributions of constructiveness. Furthermore, we examine how Leader-Member Exchange (LMX) moderates this relationship. Using a scenario-based study, we find that the negative indirect effect between employees' direct prohibitive voice and voice endorsement via attributions of constructiveness is attenuated when LMX is high. We discuss the theoretical and the practical implications of these findings.

Keywords: Prohibitive voice; LMX; Attribution theory; Experiment.



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MS0091: Case Study: Wirecard AG, an Enron Plus in the Fintech Era

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Keywords: Corporate fraud; Corporate Governance; Auditing

ABSTRACT

After the Enron and other accounting scandals in 2000s, the world re-examined the entire accounting and auditing reporting standards and restricted the accounting professional bodies. However, another astonishing scandal was exposed in 2020, that more than €1.9bn in cash was missing in the company's accounts. Despite the warnings from media for years, neither the external auditor nor the local regulators had ever exposed the wrongdoings at the company. This case study of the company, namely, Wirecard AG encourages students to dig further into the case, with a focus on corporate governance and auditing process.

INTRODUCTION

Wirecard AG (Wirecard hereafter) was a German-based company that provides customers with fintech products and electronic transaction processing services all around the globe but it is now insolvent. Wirecard conducted a wide variety of acquisitions to expand its business and operated a total of 53 subsidiaries worldwide as of the end of 2018. With its aggressive expansion and rapid earnings growth, Wirecard was included in the DAX index in 2018. In September 2018, the market capitalization of Wirecard reached a peak of €24bn. This exceeded the market cap of Deutsche Bank and Commerzbank, the top two leading banks in Germany. Wirecard's success in digital payments was once a proud and glorious story in Germany. Despite allegations of accounting malpractices since its early years by the press, short sellers, and other research organizations, the company maintained continuous and rapid growth for many years. However, eventually, independent special auditing by KPMG in 2019 and KPMG's report published in April 2020 marked the beginning of Wirecard's fall. The report stated that KPMG could not confirm that the sales revenues existed and were correct in terms of their amount, and that original bank records detailing €1.9bn were absent, causing Wirecard's shares to fall more than 30%. In June 2020, the management board finally announced that the €1.9bn in cash likely did not exist and that the company owed €3.2bn in debt. The shares plunged again by over 70%. On June 25, Wirecard filed for bankruptcy, citing over-indebtedness. The Wirecard scandal was the largest in Europe since World War II and in the whole world after Enron.

PART I

COMPANY BACKGROUND

Wirecard was founded in 1999 and was once a prestigious international group. The parent company of the group was located in Aschheim, which is close to Munich. Its services

included assisting clients and partners in accepting electronic payments across all sales channels and issuing payment instruments. Wirecard also took pride in its ecosystem, providing concurrent value-added digital payment services. As of the end of 2018, the group provided approximately 279,000 clients worldwide with various services, with a transaction volume of around €124.9bn for the year of 2018.

In the 1990s, Wirecard processed digital transactions for gambling and adult entertainment platforms. The triumphant story of Wirecard commenced in 2002 after Markus Braun provided Wirecard with capital and was appointed its chief executive officer (CEO). Under the Braun's leadership, Wirecard became a leader in the digital payment processing industry. Wirecard offered specialized and extensive digital solutions for all sales channels across its payment ecosystem. In addition to payment processing, the payment ecosystem (see Figure 1) allowed its clients to enjoy various services amalgamated through digitalization. According to Wirecard's annual reports, digital processing payments was the group's core business, with end-to-end solutions, acquiring services, and issuing solutions provided along the value chain of payment processing. Wirecard positioned itself as an exceptional partner for clients of all sizes and from all sectors because of the adaptable way in which its advanced technology combined with banking and various services.

Wirecard's operation mainly concentrated on three principal customer sectors, as stated in the group's annual reports: retailers selling consumer goods, such as daily necessities and clothing, customers selling digital goods, and travel and mobility customers.

As a leader in the digital payment industry, Wirecard adopted a four-party model (see Figure 2) and asserted that such a model enhances risk management and therefore helps prevent fraud. As illustrated, credit card companies or providers offer secure networks for electronic transactions. Customers can easily and securely complete their transactions immediately.

Retailers should provide their target customers with their preferred method of payment and strive to minimize the incidence of canceled orders and payment defaults. The store processes transactions and transfers funds through payment service providers and other financial service institutions.

Not long after its backdoor listing in 2005, Wirecard deployed an aggressive expansion strategy. After the establishment of Wirecard Asia Pacific in Singapore in 2007, Wirecard conducted a series of acquisitions, making it the largest payment processor in Europe, possessing more than 50 subsidiaries across all of the continents by the end of 2018 (see Figure 3).

TIMELINE OF WIRECARD'S MAJOR EVENTS

Wirecard was founded in **1999** as a little-known payment processor because the majority of its clients were involved in gambling and pornography. It almost became insolvent in 2002.

The legend of Wirecard commenced in **2002** when Markus Braun, a former KPMG consultant, injected capital into the company and was appointed CEO of the company. Markus then merged the company with Electronic Business Systems, one of Wirecard's primary competitors in the German market.

In **2005**, Wirecard acquired a listed company—InfoGenie, a defunct call center group—and was listed on the Frankfurt stock market through a reverse initial public offering. A year later, Wirecard took over XCOM, a software provider for financial institutions in Germany, and was soon authorized to issue credit cards and manage money, representing retailers through Visa and Mastercard.

Wirecard Asia Pacific was established in Singapore in **2007**. Shortly after then, the company faced allegations of its accounting malpractices and suspect accounts.

In **2009**, EY became the special auditor of Wirecard, replacing RP Richter. After that, Wirecard grew at a swift pace, raising €500m from the stock market and conducting a series of acquisitions in Asia between 2010 and 2014.

Dan McCrum, a reporter from the *Financial Times* (FT), published an article, “The House of Wirecard,” on **April 27, 2015**, raising questions about its huge amount of cash pre-payment and accounting treatment of intangibles. Markus Braun dismissed critics, saying, “It’s bullshit, why should I do this, I am a shareholder of this company for 12 years, I have been running this company for 12 years, why should I take this risk?” (McCrum, 2015a).

On **5 May 2015**, the FT published another article further questioning the “buy and build” strategy that was actively used in Wirecard’s expansions in Asia and that led to the recognition of €670m in intangibles. Wirecard claimed that small-scale international firms with great local influence could be acquired through such a strategy and contribute on a synergetic basis. Nevertheless, questions were raised about what was purchased and the actual worth of the €670m in intangible assets (McCrum, 2015b).

Afterward, Wirecard continued its aggressive takeovers, and it conducted its largest acquisition in India in **October 2015**. On October 27, Wirecard announced a €340m deal to acquire three Indian companies—Hermes I Tickets, Star Global, and GI Technology—from Emerging Market Investment Fund (EMIF) 1A in Mauritius. The market value of Wirecard reached almost €6bn after the announcement. However, J Capital Research, an independent research group based in the US and Hong Kong, explored the deal and discovered that some of these subsidiaries were understaffed, and two offices, which disclosed in their financial statements, did not even exist in Cambodia and Laos (McCrum, 2015c). Wirecard explained that it had no offices there because the sales from these places would be handled by the Singapore office, its headquarters in Asia, which had adequate human resources.

In **February 2016**, unnamed short sellers, who called themselves Zatarra, published reports revealing money laundering activities at Wirecard. Zatarra alleged that Wirecard continued to acquire opaque payment companies after its listing and had earned approximately €500m from the acquisitions. At the same time, people who accused Wirecard of fraudulent activities, including the FT reporters, short sellers, and research investigation groups, were targets of phishing attacks via email (Murphy & Shubber, 2020). On **March 15, 2016**, the Federal Financial Supervisory Authority (BaFin), which is the financial regulator in Germany, started an investigation into Zatarra regarding market manipulations (Auchard et al., 2016).

In **May 2016**, an anonymous whistleblower from EY sent a letter to its headquarters in Germany raising concerns that its auditor had been bribed by a senior manager from Wirecard (Storbeck, 2020). The whistleblower alleged that Wirecard's €340m deal to acquire the three Indian companies involved tampering with sales and that Wirecard management had provided a local EY auditor with benefits for signing off on its accounts (Storbeck, 2020). The anti-fraud team at EY swiftly investigated this incident, naming it "Project Ring"; however, the investigation was finally terminated by Marsalek, COO of Wirecard (KPMG AG, 2020).

On **June 29, 2016**, Citigroup in New York announced a deal to sell its institutional prepaid card services to Wirecard (Citigroup Inc., 2016). The deal was marked as a milestone for Wirecard in entering the US market. Wirecard's cooperation with Citigroup continued on **March 17, 2017**, when Wirecard announced the takeover of the Citigroup payment processing businesses in 11 Asian countries, including Macau, Taiwan and India (Zahid, 2017).

At the **end of 2017**, Deutsche Bank provided Braun with a €150m margin loan with half of his shares pledged as collateral (Storbeck et al., 2019). After the deal, Braun was still the largest shareholder in Wirecard, owning 7% of the shares.

In **March 2018**, Pav Gill, a former senior legal counsel in the Singapore headquarters, became an internal whistleblower to expose the fraud conducted by the Wirecard executives in Singapore. According to Gill, the senior management of Wirecard adopted a “round-tripping” scheme to transfer money to its Indian subsidiaries through third parties. This might have misled investors because the company created the illusion that such transactions were profits generated in the business (Kilby, 2022). Three staff members in the finance team were investigated with regard to this matter, but this internal investigation was terminated with no results.

On **August 31, 2018**, Wirecard’s share price reached a peak of €193.50, and Wirecard reached a market value of more than €24bn. On **September 5, 2018**, Wirecard replaced Commerzbank, a leading bank in Germany, on the DAX30 index.

While Wirecard was celebrating its success, the FT dealt a blow to the company on **January 30, 2019**, publishing an article revealing that the senior management of Wirecard was under investigation by the Singapore government for using forged contracts (McCrum & Palma, 2019). In **February 2019**, BaFin took legal action against the two authors of the article, citing market manipulation (Nicola & Syed, 2020).

On **February 8, 2019**, the local police raided Wirecard’s offices in Singapore and seized some electronic devices for further inspection (Palma & McCrum, 2019a). Wirecard’s stock price further dropped to below €100 as overseas authorities and investors inspected the company’s accounts. BaFin immediately banned shorting Wirecard’s shares for the next two

months, citing Wirecard's "importance for the economy" and a "serious threat to market confidence" (McCrum & Chazan, 2019).

The FT published a series of reports disclosing Wirecard's important but suspect acquiring business and the related problem partners. Despite the critics, EY signed off Wirecard's 2018 accounts with minor qualifications in **April 2019**. On **April 24, 2019**, SoftBank purchased Wirecard's convertible bonds and injected €900m into the company.

In **October 2019**, the FT released internal Wirecard documents, which were provided by Gill. The documents indicated that sales and profits at Wirecard businesses in Dubai, Ireland, and Singapore might have been invented. To free the company from doubts and allegations, in **October 2019**, Wirecard appointed KPMG to conduct an independent special investigation regarding the FT's accusations.

In **March 2020**, EY delayed the issuance of Wirecard's 2019 annual report while waiting for KPMG's investigation findings. On **April 28, 2020**, KPMG finally released its investigation results. However, the results did not assuage suspicions and even led to more condemnations regarding Wirecard's special accounting treatments of cash and sales, as well as its corporate governance and control mechanisms. EY postponed the publication of Wirecard's 2019 annual report until June.

On **June 5, 2020**, the Munich prosecutor searched the Wirecard headquarters in Munich, and the prosecutor launched a criminal investigation against Braun. EY was informed by two banks in the Philippines, Bank of the Philippine Islands (BPI) and Banco de Oro, that Wirecard had forged the documents regarding its €1.9bn in cash in the accounts on 16 June 2020.

On **June 18, 2020**, EY announced that Wirecard had “deceived the auditor” and might have provided “spurious cash balances”. Wirecard management announced that its €1.9bn in cash was missing on the same day. The shares price plummeted to close to zero. In the next two days, Marsalek and Braun resigned from their positions at Wirecard. On **June 25, 2020**, Wirecard filed for insolvency. The kingdom of the most significant German payment processor had collapsed (see Figure 4 and Figure 5).

Part II

PROBLEM AREAS

After Wirecard filed for bankruptcy, analysts and institutional organizations conducted inspections to discover the culprits and to make improvements. Despite the allegations from the media and short sellers, Wirecard continued to enjoy high popularity among investors in Germany and worldwide until its management announced the missing €1.9bn in cash in June 2020. In October 2018, its stock market price had quadrupled in the three years since the FT’s first article questioning its accounting practices in October 2015. The top managers of Wirecard deployed a series of fraud schemes, including creating complex organizational structures and manipulating accounting numbers to cover their wrongdoing. Even after KPMG’s special audit, there were still innumerable accusations that could not be proven or verified.

Wirecard’s Acquiring Business and Unusual Accounting Practices

Wirecard’s revenues came from three segments: payment processing and risk management, acquiring and issuing, and call center and communication services (Wirecard 2018 annual report). In 2018, payment processing and risk management contributed more than 70% of the group’s revenues. However, in early 2019, the FT published a series of articles alleging that

half of the group's revenues and almost all of its profits came from three opaque and problematic third-party acquirer (TPA) partners. In the late 2000s, Wirecard started expanding to the Asia-Pacific and other areas through its intensive mergers and acquisitions (M&As) and acquisitions of customer profiles. However, during this rapid expansion, it did not possess the necessary licenses to process transactions for clients in some areas. Those clients were therefore referred to its TPA partners. This referring business was operated mainly through three of its subsidiaries: CardSystems Middle East, Wirecard UK & Ireland, and Wirecard Technologies. The partners then processed the credit card transactions for the customers referred by Wirecard. The processing fees paid by the customers were collected by the relevant Wirecard companies. The TPA partners in turn received commissions for the processing services they provided in this referring business model (see Figure 6). As shown in the figure, the processing fees collected were recorded as "cash and cash equivalents" (to keep the illustration simple, we use "cash" for "cash and cash equivalents" in the figure), and those before collection that were held by Wirecard as receivables were recognized as "acquiring receivables." According to the KPMG special audit report released in April 2020, during the investigation period from 2016 to 2018, payments received on acquiring receivables via TPA partners totaling €85m were held at Wirecard Bank, and payments of €1bn of such were held in trust accounts at the end of 2018.

With this unique business model, Wirecard adopted a "gross accounting" method to book the revenues earned via its TPA partners. Under this method, the transaction processing fees collected by Wirecard subsidiaries were booked by them and consolidated in the group's revenues, and the commissions paid to the relevant TPA partners were reported as "cost of materials" on the group's consolidated income statements because "Wirecard considers itself the principal for the service obligations identified in the transaction chain within the meaning of IFRS" and "Wirecard had the control over the transactions and thus over the fulfillment of

the service obligation vis-à-vis the respective merchant” (KPMG special audit report, 2020). Thus, “despite the lack of a direct contractual relationship between Wirecard and the respective merchant, the latter was nevertheless regarded as a customer in accounting terms under IFRS. The TPA partner was merely classified as a service provider required to provide services to the merchant and thus as an agent” (KPMG special audit report, 2020). However, by the end of KPMG’s investigation, Wirecard had not provided any relevant documents that were essential for assessing the above amounts of balance.

In addition, the FT questioned the accounting practices surrounding cash and cash equivalents, and KPMG conducted investigations of the two trustees of Wirecard. Wirecard’s cash generation grew by approximately 40% between 2016 and 2017. A company’s cash flow is a principal factor for investors in determining its financial health. It is essential when assessing a company’s short-term viability, particularly its capacity to pay its debt. Wirecard described its accounting methods surrounding cash and cash equivalents in an ambiguous way (see Figure 7) on the disclosure notes of the financial statement. Furthermore, the notes did not clearly state the basis and reasons for classifying the revenues of the TPA partners as cash or cash equivalents.

Moreover, the opaque information of the two trustees was suspicious because KPMG could not acquire adequate information from either the trustees or Wirecard. Thus, KPMG could not verify the existence of Wirecard’s more than €1bn cash in the trust accounts. Despite the long-standing relationship, Wirecard could not provide KPMG with the financial statements, economic situation assessments, and reliability assessment of Trustee 1. In addition, Trustee 1 broke off its relationship with Wirecard during the inspection in late 2019 and then refused to cooperate with KPMG. As a result, Trustee 2, a law firm, was recommended by Trustee 1 and managed Wirecard’s trust accounts beginning on February 20, 2020.

Professor Collins Ntim from Southampton Business School pointed out that the trustee should be an independent party who settles conflicts if necessary; therefore, the accounting practice of the funds in trust accounts should be determined by the contract terms (McCrum, 2019c). It is vital to understand the obligations stated in the contracts and the circumstances under which further obligations must be fulfilled to access the money held by the trustees. Nonetheless, Wirecard did not disclose these contracts to KPMG.

Mergers and Acquisitions

Rather than having organic growth, Wirecard leveraged aggressive acquisitions to achieve rapid growth for many years and pushed its stock price to a record high. Wirecard started showing a passion for acquiring small to medium-sized companies in the Asia-Pacific region in 2007 after the establishment of Wirecard Asia Pacific. After that, Wirecard's management commenced a decade of intensive acquisitions. Just from 2014 to 2018, Wirecard conducted 11 M&A activities (see Appendix). However, the intensiveness of the acquisitions, unexplained high purchase prices, hundreds millions of goodwill, and customer relationships recognized during the acquisitions, as well as Wirecard's limited disclosures about the transactions, drew the attention of the media and short sellers.

Next, we review Wirecard's largest deal as an example. In October 2015, Wirecard announced its acquisition of three Indian companies, Hermes I Tickets, Star Global, and GI Technology, from a Mauritius private fund, Emerging Market Investment Fund (EMIF) 1A. Investigations following the deal revealed that Hermes I and GI Technology were initially held by GI Retail. These two companies were so-called smart shops and were commonly used by Indians to pay their utilities and process daily transactions. GI Retail had sold the two subsidiaries to EMIF 1A for €37m six weeks before Wirecard's acquisition. EMIF 1A had also acquired Star Global for an undisclosed amount of money shortly before the acquisition.

Wirecard paid €326m to EMIF 1A for the acquisition of Hermes I Tickets, GI Technology, and Star Global and invested €14m in GI Technology. In other words, Wirecard paid €340m for the entire acquisition (see Figure 8). Wirecard acquired the companies for approximately eight times their market value, and it was revealed that at least €175m had never reached the seller in this deal (Boyd, 2018).

According to a Foundation for Financial Journalism report, Wirecard transferred money to third parties in India from its German headquarters. Then, the third parties used this money to purchase products and services from the company. EMIF 1A played an indispensable role as an intermediary to draw profits from the acquisition. The entire scheme was known as “round-tripping.” The beneficiary of EMIF 1A had not been disclosed by the end of April 2020, when KPMG completed its investigation.

Wirecard’s disclosures about the acquisition were too limited and too optimistic to dismiss these questions and allegations. Wirecard’s acquisition announcement on October 27, 2015, stated the following: “Consolidated revenues from the acquired businesses are well on track to exceed EUR 45 million in the calendar year of 2015, an increase of more than 50 percent compared with the calendar year 2014, and EBITDA is expected to more than double in comparison to 2014 year-on-year to exceed EUR 7 million in 2015. Revenues for the calendar year 2016 are expected to exceed EUR 75 million and EBITDA after integration costs is expected to be between EUR 15 million and EUR 18 million in 2016.” In its 2015 annual report, Wirecard provided just the approximate amount of the transaction and explained that “as a result of the short period of preparation, the amounts disclosed are not final.” Neither the relevant notes nor the disclosures mentioned the involvement of EMIF 1A in the acquisition.

Corporate Governance and Management

German corporate law and its corporate governance code mandate a two-tier board structure (supervisory board and management board) for AGs (German publicly traded companies that are incorporated as Aktiengesellschaften). “The Management Board is responsible for managing the enterprise in its own best interests. Its members are jointly accountable for managing the enterprise. The Chair of the Management Board coordinates the work of the Management Board Members. The Management Board develops the enterprise strategy, coordinates it with Supervisory Board, and ensures its implementations. The Supervisory Board appoints and discharges the members of the Management Board; it supervises and advises the Management Board in the management of the enterprise and has to be involved in the divisions of fundamental importance to the enterprise” (German Corporate Governance Code, December 2019, p.4).¹

As a German public stock corporation, Wirecard AG operated under this dual management and control structure. By the end of 2017, Wirecard’s management board had been dominated for nearly a decade by three members: Markus Braun, Jan Marsalek, and Burkhard Ley (see Figure 9). **Markus Braun**, an Austrian, had worked in the digital payment industry for years before he injected a considerable sum into Wirecard and became the CEO of the company in 2002. He had also been the company’s largest shareholder from 2002 until the end of 2017, when he pledged half of his shares for a loan. **Jan Marsalek**, who also came from Austria, joined Wirecard as a project manager in 2000. He was promoted to vice president of technology and product development two years later and further promoted to the chief operating officer (COO) of the company in February 2010. **Burkhard Ley** was Wirecard’s chief financial officer (CFO) between 2006 and 2017. Years earlier, he had started his career in the banking industry, working at Stadt-Sparkasse Solingen. Before joining Wirecard, he

¹ There were no material changes in the suggested roles of the management board and supervisory board from earlier versions of German Corporate Governance Code.

had provided companies with consultations and advice on mergers, acquisitions, and equity transactions. At the end of 2017, when Braun cashed out half of his equity interest in Wirecard, Ley resigned from his position as Wirecard's CFO and left the company. Around 2017, which was a year of turmoil for Wirecard, several events occurred that could have been devastating to the company and its management. In May 2016, EY in Germany received a warning from an internal whistleblower, who said that an EY auditor had been bribed and signed off on the manipulated sales numbers of Wirecard's Indian deal. An internal investigation was started to follow up on this but was eventually ended by Marsalek. In March 2018, Pav Gill, an internal whistleblower, reported to the Wirecard's German headquarters that a top executive in Singapore forged contracts to boost sales. The headquarters did not respond positively to Gill. He then contacted the FT in October 2018. In January 2019, the FT published the article "Executive at Wirecard suspected of using forged contracts" and publicly alleged accounting malpractices at Wirecard. These events are also presented on the timeline in Figure 9. In January 2018, **Alexander von Knoop**, who had worked at Wirecard since 2005, was appointed the new CFO, and **Susanne Steidl** was appointed the chief product officer(CPO), a new position responsible for Wirecard's operation and technological development.

Compared with its DAX30 peers, Wirecard had a smaller supervisory board from 2008 to 2018,² especially before 2016. Wirecard's supervisory board had the low turnover of board members in addition to the small size of the board (see Table 1).

Wulf Matthias was elected as the chairman of Wirecard's supervisory board in June 2008. Before this, he had worked as a member of the executive board of the German subsidiary of Credit Suisse, but he had no experience at the top of a large corporation. During his tenure as

² The analysis period is limited to 2008-2018 because of the unavailability of Wirecard's financial statements for the years before 2008.

the chair of Wirecard's supervisory board, Matthias also served as senior advisor, managing director, and member of the executive board at Wirecard Bank and other companies. Wulf Matthias resigned from his position as chair in January 2020, right after Wirecard appointed KPMG to conduct an independent special investigation and before EY delayed the issuance of the Wirecard 2019 annual report. Officially, personal reasons were cited to justify this resignation.

Alfons Henseler, the deputy chair of the supervisory board of Wirecard from June 2006 to June 2019, has many years' experiences in the banking and financial services industry. In his years as the deputy chair of Wirecard's supervisory board, Alfons Henseler was a board member or chair at various financial services companies: Trustpay Intl, Wirecard Technologies, Leasing Brokers, Pensionata, Diamos, and Wirecard Bank.

Paul Bauer-Schilichtegroll was one of the founding members of what eventually became Wirecard. He resigned from the supervisory board in October 2009.

Stefan Klestill, a fintech specialist, the son of a former Austrian president, and a close business partner of Markus Braun, was appointed by the court in November 2009 as Paul Bauer-Schilichtegroll's successor. He remained in this position until August 2020. Stefan Klestill also served as a lead partner at Speedinvest, operating partner at Advent International, and board member at Wirecard Bank, Billie, FinCompare, Credi2, and +Simple.

As a part of expanding and diversifying the board, **Tina Kleingarn** and **Vuyiswa V. M'Cwabeni**, two young female members, entered the supervisory board in 2016. **Tina Kleingarn** resigned in 2017 after just 18 months because of concerns about the company's poor corporate governance and because her attempts to push for change had been unsuccessful. "The company was led in an extremely casual way," she said at the parliamentary inquiry in November 2020. She explained that the internal control structures

were “like at a start-up rather than a listed company.” Following her departure, two new members were elected to join, namely, **Anastassia Lauterbach** and **Susana Quintana-Plaza**.

Although the German Corporate Governance Code recommended that the supervisory board establish an audit committee, nomination committee, and other committees as early as 2002, the Wirecard supervisory board had not formed any committees by the end of 2018. In early 2019, when the FT published an article alleging that the company used forged contracts to manipulate its accounting numbers, the supervisory board established three committees in a state of emergency: an audit committee, a remuneration, personnel and nomination committee, and a risk and compliance committee.

The combination of the small sizes of both the management board and supervisory board, the long and overlapping tenures of their members, and the absence of an audit committee and a rigorous internal control structure may have created conflicts of interest over the course of 10 years, possibly signaling existing risks and problems. In addition, “paid external advisers will not jeopardize future fees with harsh truth” (German Parliamentary Review, 2018), and most of the supervisory board members participated in the supervision boards of multiple companies. Although new members were joining the supervision board, they were inexperienced and perhaps too new to the digital payment processing industry compared with the management executives (Teixeira, 2021). Therefore, it is also debatable whether the members had enough time and sufficient knowledge to discharge their fiduciary duties (Giovannetti, 2020).

In January 2020, Braun borrowed €35m from the payment group’s banking arm, Wirecard Bank, to refinance the €150m loan from Deutsche Bank that he had arranged three years earlier. The €35m loan was approved by the management and supervisory boards of Wirecard Bank. Two of the three members of Wirecard Bank’s supervisory board, Matthias and

Klestill, also had seats on Wirecard's supervisory board. Wirecard Bank, which had €298.6m of outstanding loans by the end of 2019, was a small lender specializing in settling credit card payments. A €35m loan to a single individual represented a large, concentrated risk to the tiny lender. If Braun defaulted and the loan had to be completely written off, more than a fifth of the lender's equity would have been wiped out. A person familiar with the matter revealed that the loan was not secured by either a guarantee or collateral.

Wirecard Bank also lent to its questionable business partners. By the end of March 2020, a total of €870m of these loans stood in the lender's books. One of these loans was an €11.3m credit granted to a Singapore-based company, Bijlipay, that was a Wirecard business partner in India. The loan became non-performing after less than two years as the company was lossmaking and had an unsustainable level of debt. However, at that point, Marsalek intervened and granted a deferral for the loan. Wirecard's supervisory board was informed about the deferral by its auditor EY eight months later in March 2019. Tina Kleingarn, a former supervisory board member, alleged at the German parliamentary in December 2020 that the supervisory board was provided with scant information about the guarantees that Wirecard gave for loans to external business partners. Munich prosecutors suspected that loans to opaque business partners, which by March 2020 had grown to €870m, were one way to tunnel money out of the company.

The theory of codetermination is embodied in the two-tier German board, which is intended to protect the interests of both workers and shareholders. However, this theory of codetermination is nearly impossible to operationalize when the representatives on the supervisory board are ill-informed or not informed at all of the management board's decisions and policies (Sharpe, 2017). Therefore, in practice, companies with low

transparency and poor internal controls may not be able to strike a balance between the two boards' powers (Jo et al., 2021).

Without being effectively monitored by the supervisory board or other committees, Wirecard's management board was freer to manipulate its earnings to mask its self-interested bad decisions. The question is whether the board's (or perhaps mainly Braun's) incentive to tamper with the books was strong enough to commit accounting fraud.

In general, the widespread use of accounting information by investors and analysts in valuing stocks can create an incentive for managers to manipulate earnings in an attempt to influence stock price performance. These stock market incentives are likely to be strong when there is a gap between a firm's performance and analysts' or investors' expectations (earnings targets). Managers know that the capital market will punish the entire firm if they miss these earnings targets. On average, the stock price falls by 5.4% upon negative earnings surprises and rises by 5.5% more than a size-matched portfolio when a firm produces earnings that beat the consensus analyst forecast. In line with this theory, Jensen (2005) identified extra agency costs created by overvalued equity. Because stock prices reflect the market participants' expectations, overvalued equity means that the company will not be able to deliver the performance required to justify its value or its stock price or meet investors' or analysts' expectations. The managers of an overvalued company who have trouble meeting earnings expectations may start pushing expenses forward and pulling revenues from future periods into the current year. However, once managers start lying to manage earnings, it is impossible to stop because of the cascading effects. Over time, small holes grow bigger and bigger, requiring even more manipulation in the future to forestall the day of reckoning. Eventually, the managers may even turn to fraudulent practices to continue the appearance of high growth and value creation.

First, if accounting data are used to write and regulate management compensation contracts, these contracts may create an incentive for earnings manipulations because it is costly for the board of directors or compensation committees to “undo” the manipulations (Watts & Zimmerman, 1978). Second, to better align the interests of managers and stakeholders, managers’ compensation can be linked to the company’s stock price performance. There are many ways to create equity incentives, such as to award managers options, restricted shares, or share appreciation rights. When the company’s stock price increases, managerial wealth becomes more concentrated in the stocks and options, and managers’ risk exposure increases. The incentive for earnings management arises when the risk exposure goes beyond the level that managers are willing to bear, at which point they are likely to sell their stocks or exercise their vested options. Thus, these equity incentives can lead managers to focus on short-term stock prices, leading to an incentive for earnings management (Chen & Warfield, 2005; Efendi et al., 2007).

Equity-based compensation or equity holdings by managers cannot solve the agency problem associated with overvalued equity that we discussed earlier. “In the context of overvalued equity such equity-based incentives are like throwing gasoline on a fire—they make the problem worse, not better” (Jensen, 2005, p. 14).

From 2002, Braun served as Wirecard’s chief executive officer (CEO) and chief technology officer (CTO). He was also its largest shareholder until the end of 2017, when he pledged almost half of his stake as collateral for a €150m loan from Deutsche Bank. After the deal, he still held around 7% of the shares of Wirecard.³ Braun styled himself after Apple’s Steve Jobs, always wearing black turtleneck sweaters at public events. His favorite words were “strong,” “machine learning,” and “ecosystem.” As an analyst at Mirabaud Securities recalled during

³ When Braun was visiting one of the company’s largest shareholders in the summer of 2017, the investor mentioned that his institution held 2.4m of the company’s shares. Braun replied, “Well, I personally own 8.6m.” As at the end of 2017, the company had a total of 132.5m shares outstanding (Wirecard 2017 annual report).

an interview in June 2020, “If you were very gullible you might say that he is a tech visionary.” For years, Braun displayed a charisma that charmed analysts into believing the company’s unmatched growth and profitability, as well as his predictions of the company’s bright future. Markus Braun constantly checked Wirecard’s share price on his mobile phone. “Everyone internally was totally stressed out by this,” and when the price fell, senior managers received angry calls instructing them to “do something about this,” said a person who worked closely with Braun (McCrum & Storbeck, 2020). Since its initial listing, there was always a section titled “Wirecard Stock” in its annual report that discussed the company’s stock performance in comparison with the market index. At the beginning of 2016 (see Figure 10), Wirecard’s stock price was €3.95 per share, and it reached its peak of €193.50 on August 31, 2018, an astonishing rise of nearly 4,800%. Over the same period, the German DAX30 index (see Figure 11) barely doubled from 5,705 to 11,736. While we know that capital markets tend to favor and overvalue what is new—telecommunications, fintech, internet ventures, etc.—it is difficult to tell whether Wirecard was overvalued before its fraud was exposed in 2020. However, when management admitted that €1.9bn in cash was missing, the company’s accounting fraud was revealed and its stock price plunged nearly to zero in 2020. Therefore, the company was substantially overvalued before, and the managers clearly knew that. Otherwise, they would not have pushed beyond the legal limits and risked the jail time associated with lying to the markets. It was their knowing contribution to misinformation and manipulations that induced and fed the decadelong overvaluation.

Wirecard’s remuneration scheme for its management board had long comprised both non-performance and performance components. According to its 2018 remuneration scheme for managers (see Table 2), as there were no substantial variations in the remuneration scheme in the years before 2018. As shown in the table, the performance-related remuneration included single-year remuneration (SVR) and multiple-year remuneration (MVR) components. MVR

was measured on the basis of three equally weighted performance targets over a term of three years. SVR was structured on accounting performance and stock price performance equally for one year and was paid at the end of the year. By linking the remuneration of the management board to the company stock price in both the short and long term, this remuneration scheme was intended to incentivize the managers to increase the shareholders' wealth. However, when combined with the company's key manager's dominant equity holding, its substantially overvalued equity, and the absence of a clawback provision in the remuneration scheme, this remuneration scheme could have also incentivized the managers to manipulate earnings to achieve the underlying performance targets.

Auditor and Regulators

Notwithstanding the allegations by the FT and short sellers, the group auditor (EY) and the German regulators BaFin and the Financial Reporting Enforcement Panel (FREP) failed to discover the wrongdoings at Wirecard and to warn the investors. The public took umbrage against them because of their failures.

Carmine Di Sibio, the Global Chairman of EY, pointed out that “the collusive acts of fraud at Wirecard were implemented through a highly complex criminal network designed to deceive everyone—investors, banks, supervisory authorities, investigating lawyers and forensic auditors, as well as ourselves” (Kinder, 2020). However, KPMG's independent special audit report disclosed that a whistleblower had warned EY regarding the illegal activities at Wirecard as early as 2016.

Investors were discontented with EY's auditing work, as the auditors should have inspected the accusations by the reporters and whistleblowers and retained professional skepticism rather than issuing a clean report for Wirecard. Consequently, a cluster of Wirecard's investors sued EY for failing to fulfill its professional duties to the public. Nonetheless, the

investors' jurisdiction is too enduring and sophisticated for investors, even large institutional ones. Generally, the German court would request the auditor to provide compensation only if the investors can prove that their losses were incurred because of the auditing work. EY refused to provide the relevant documents, citing confidentiality, and it is challenging, if not impossible, for the investors to collect sufficient evidence to endorse their claims.

Andreas Loetscher, the former engagement partner of Wirecard's audit, resigned from EY and became Deutsche Bank's head of accounting in 2018 but later left the bank. In January 2023, Apas, Germany's auditing regulator, closed investigations against four current and former EY auditors involved in inspecting Wirecard after they handed back their professional licenses and left the profession. The three EY audit partners who were in charge of the Wirecard audit since 2016, Andreas Budde, Andreas Loetscher, and Martin Dahmen, were among the four who resigned. Under German law, Apas can only probe and sanction potential misconduct by active accountants. The German regulator BaFin was founded in 2002 and serves as the main regulatory body for appropriate corporate securities trading and for German banks and insurance firms. BaFin is mainly led by an executive board that comprises a president and four to five members. Critics questioned BaFin's actions surrounding adverse news about Wirecard. BaFin investigated the short sellers and sued the FT reporters regarding suspecting market manipulations in 2016 and 2019, and it banned short selling the stocks for two months in 2019. When BaFin eventually noticed the necessity of investigating Wirecard, the German FREP was assigned to conduct the inspection. FREP is a voluntary regulating committee overseeing accounting and auditing service providers. However, because this regulator had been understaffed for years, it could only send one investigator to follow the Wirecard case after receiving the investigation request from BaFin (Storbeck & Chazan, 2020).

After Wirecard filed for insolvency in June 2020, Felix Hufeld, the president of BaFin, was removed from the board, and the related staff were investigated. BaFin was condemned by Germans and even the European Union. Some Wirecard's investors took legal action against BaFin for its ban on short selling in 2019 and its failure to conduct a timely investigation to reveal the fraud. However, the Frankfurt district court dismissed all of the allegations in January 2022. The presiding judge pointed out that "a potential violation of legal duties hence cannot result in a duty to compensate an investor who suffered losses" and that "third parties were not legally protected from the watchdog's mistakes" (Storbeck, 2022).

Assignments

Assignment 1:

Find Wirecard AG's financial reports for 2014, 2015, 2016, 2017, and 2018 at

<https://www.wirecard.com/>. Using the statements, answer the following questions:

- (a) Prepare common-size statements of financial position for Wirecard AG for all five years.
- (b) Which assets were the most significant to Wirecard AG? Are the relative proportions of the most significant current and non-current assets what you would expect for an online payment processing company?
- (c) Analyze the cash and cash equivalents cash flows. Using the notes to the financial statements, discuss the accounting methods used to account for cash and cash equivalents. What other information can be learned from the notes? Locate three companies in the online payment processing industry. Comment on how well you think the industry average would work as a guide when analyzing Wirecard AG's cash flow. Analyze Wirecard's cash flows.
- (d) Locate the necessary information in the notes on "receivables of the acquiring business" and "trade and other receivables" to get the meaning of these account balances. Analyze the receivables of the acquiring business, trade, and other receivables in relation to their revenues over the five years. If you observe any abnormal patterns in the changes in the revenues and receivables, try to give possible reasons for them. Comment on the company's disclosure of its receivables, especially on how the portion of doubtful accounts was estimated.

- (e) Using the consolidated financial statements for the years selected, analyze the profitability of Wirecard AG by preparing a common-size income statement for the five years. In addition, calculate the sales growth for each two-year period presented. Based on the company's major competitors and the industry average, are the sale growth rates what you would expect?

Assignment 2:

- (a) Read through and discuss the case. Identify the red flags or signals in Wirecard's corporate governance, internal control, and other matters that you think are relevant to financial fraud. Explain why in detail for each of your points.
- (b) Were there any external corporate fraud risks? Discuss. Please cover the external auditor and the German regulators in your discussion; however, you are encouraged to also explore other areas.

Learning Objectives

This case study presents a comprehensive timeline and problems regarding the operations of Wirecard. Students are encouraged to discuss and evaluate the scandal in terms of diverse aspects, such as accounting treatments and the auditing process. The designed questions challenge them to investigate potential fraudulent schemes and demonstrate the required tests of control in auditing. Specifically, the learning objectives of this case are as follows:

- Students will develop the ability to look for relevant information in financial statements.

- Students will learn to apply various techniques to process and analyze information from financial statements as part of decision-making in certain business contexts such as security analysis and credit analysis.
- Students will be required to identify signals and red flags in Wirecard's financial statements, disclosure, corporate governance, and internal controls that could have helped the investors, auditors, and regulators to detect the corporate fraud at an earlier stage.
- Students will be encouraged to identify the external fraud risk factors at Wirecard that led to the evolution of the corporate fraud.
- Students will gain knowledge about the fraud types of business group financial statements for fintech companies, especially when commerce is mixed with banking.

Implementation Guidance

Intended Students of the Case

This case is intended to be used in a graduate- or advanced undergraduate-level financial statement analysis, auditing and assurance, corporate governance, or business ethics course.

The case may be used in a financial statement analysis course with caution, as the financial statements presented accounting fraud and thus the numbers were manipulated.

In Class: Introducing and Assigning the Case

The instructor should briefly introduce and provide the case to the students in class. The case is intended to be assigned as a group project. As such, the instructor should divide the class into groups of three to four. The students should be allowed one to three weeks to do their

own research, collect information, perform analyses, and write and submit a written report. Each group should also be required to prepare a poster for class presentation and discussion.

In Class: Class Discussion

Students should come to class with their presentation slides in response to the part three assignment questions. The groups should then present their responses and discuss them with the class, explaining what corporate fraud signals they identified by analyzing the company’s financial statements, what red flags and external corporate fraud risk factors they discovered, and what method(s) or framework they used. During the discussion, the instructor should list the key points on the board. The instructor should facilitate the discussion by encouraging the students to compare each team’s reports.

Implementation Timeline

Case Activity	Estimated Time
Introduction and grouping	60 minutes
Research, analysis, writing report, and preparing a poster	1-3 weeks
In-class presentation and discussion	90 minutes

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FIGURES

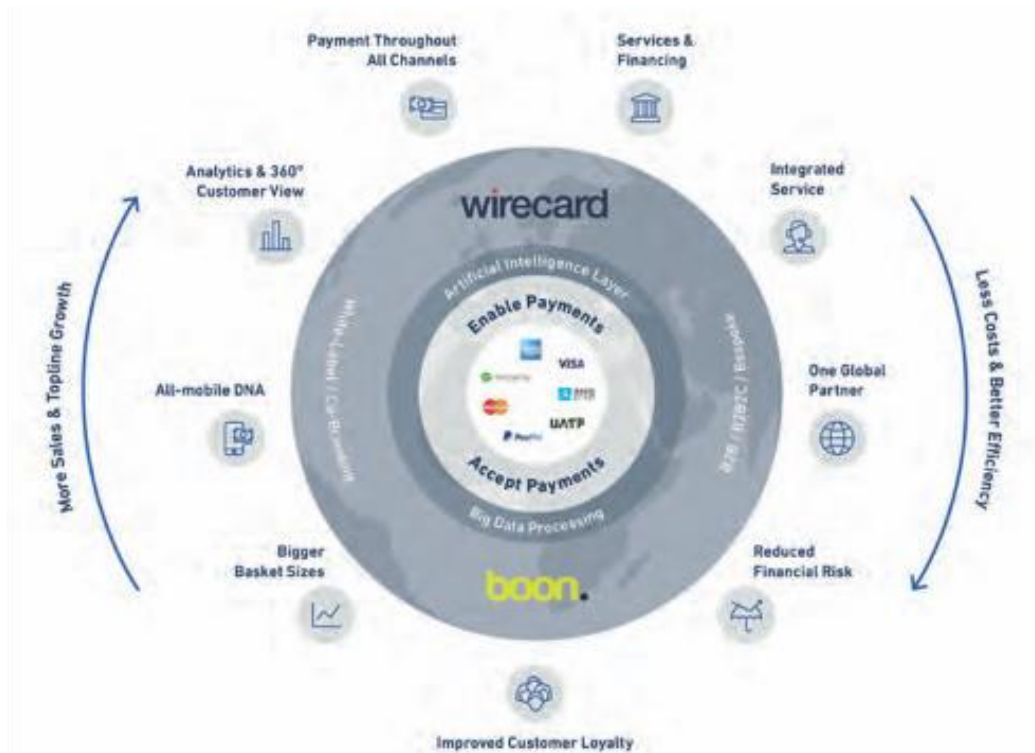


Figure 1: Wirecard's Payment Ecosystem
Source: Wirecard 2018 annual report

Four-party model

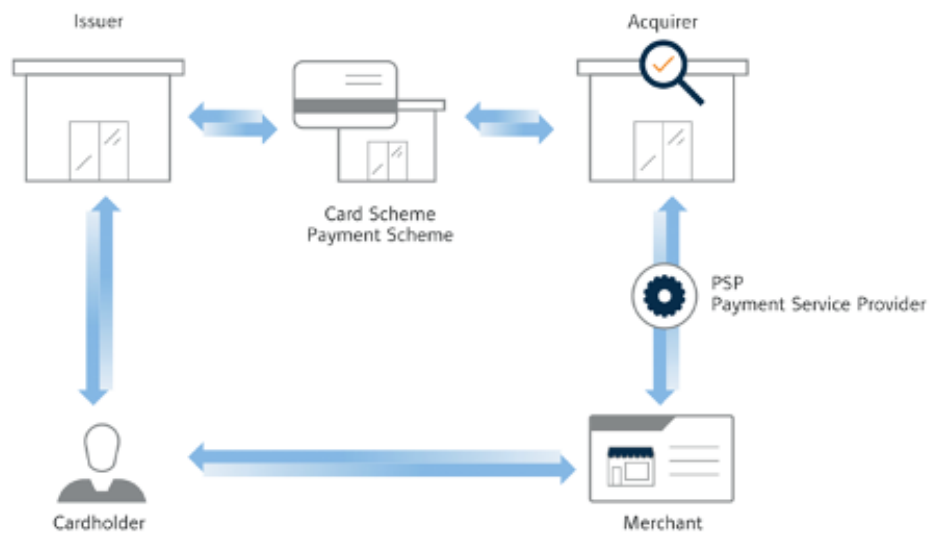


Figure 2: Wirecard's Four-Party Model
Source: Wirecard 2016 annual report

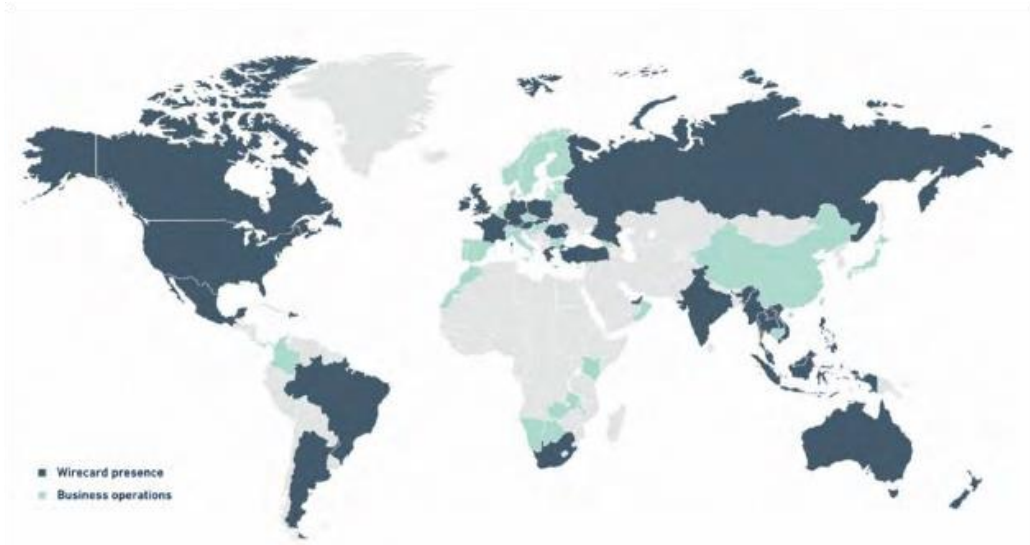


Figure 3: Wirecard's Global Distribution
 Source: Wirecard 2018 annual report

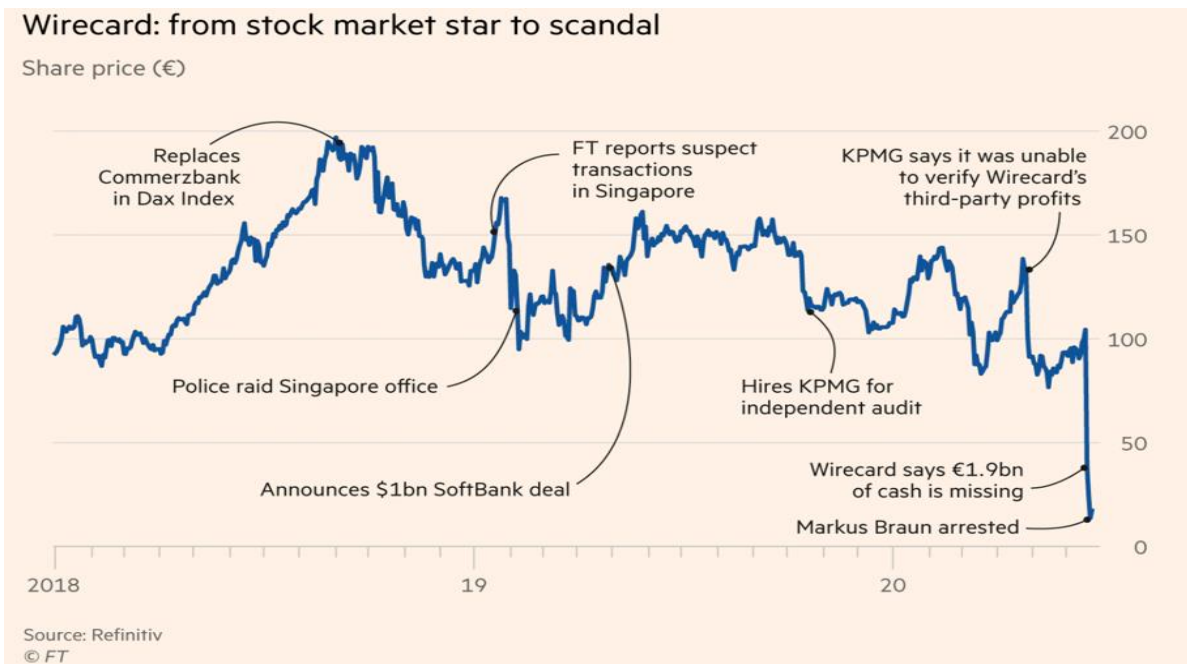


Figure 4: Wirecard's Stock Price Movement
 Source: Bloomberg

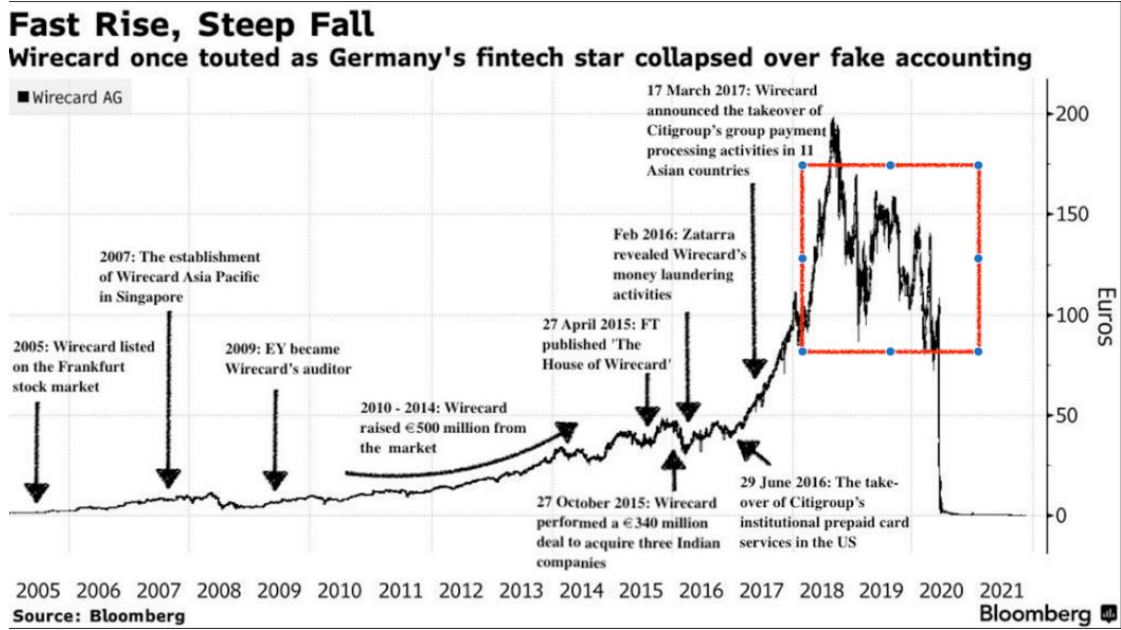


Figure 5: Wirecard's Stock Price between 2018 and 2020
Source: Financial Times

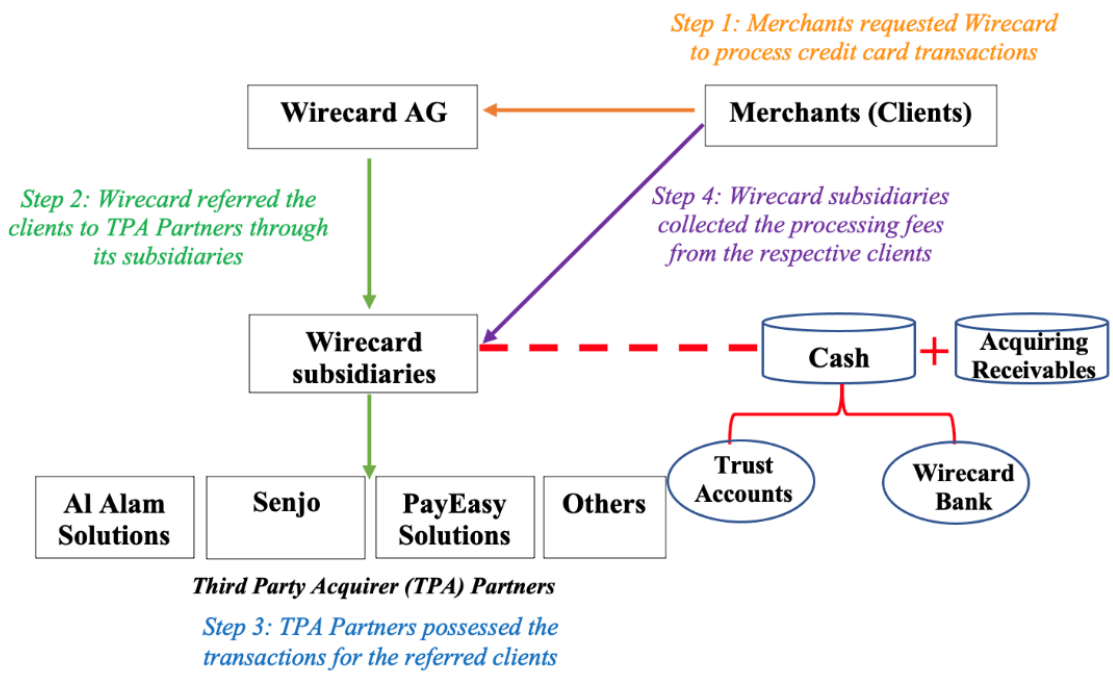


Figure 6: Wirecard's Referral Business with Its TPA Partners

3.11 Cash and cash equivalents

As of 31 December 2018, the item "Cash and cash equivalents" totalling EUR 2,719.8 million (31 December 2017: EUR 1,901.3 million) included cash in hand and bank balances (demand deposits, fixed-term deposits with a term of up to three months and overnight deposits). This item also includes cash from current customer deposits of Wirecard Bank AG and Wirecard Card Solutions Ltd. which are not placed in interest-bearing securities (31 December 2018: EUR 1,263.0 million; 31 December 2017: EUR 973.2 million)

and funds from the acquiring business of Wirecard Bank AG (31 December 2018: EUR 453.4 million; 31 December 2017: EUR 240.9 million). To improve its interest income, Wirecard invests some of the customer deposits in various short, medium and long-term interest bearing securities (collared floaters and interest-bearing securities). These are reported under non-current financial and other assets and current interest-bearing securities. Excluding the purchase of these securities and the fixed-term deposits with a term of more than three months, the item "Cash and cash equivalents" would have been EUR 166.7 million higher as of the reporting date (31 December 2017: EUR 155.6 million).

Figure 7: Notes of Cash and Cash Equivalents
Source: Wirecard 2018 annual report

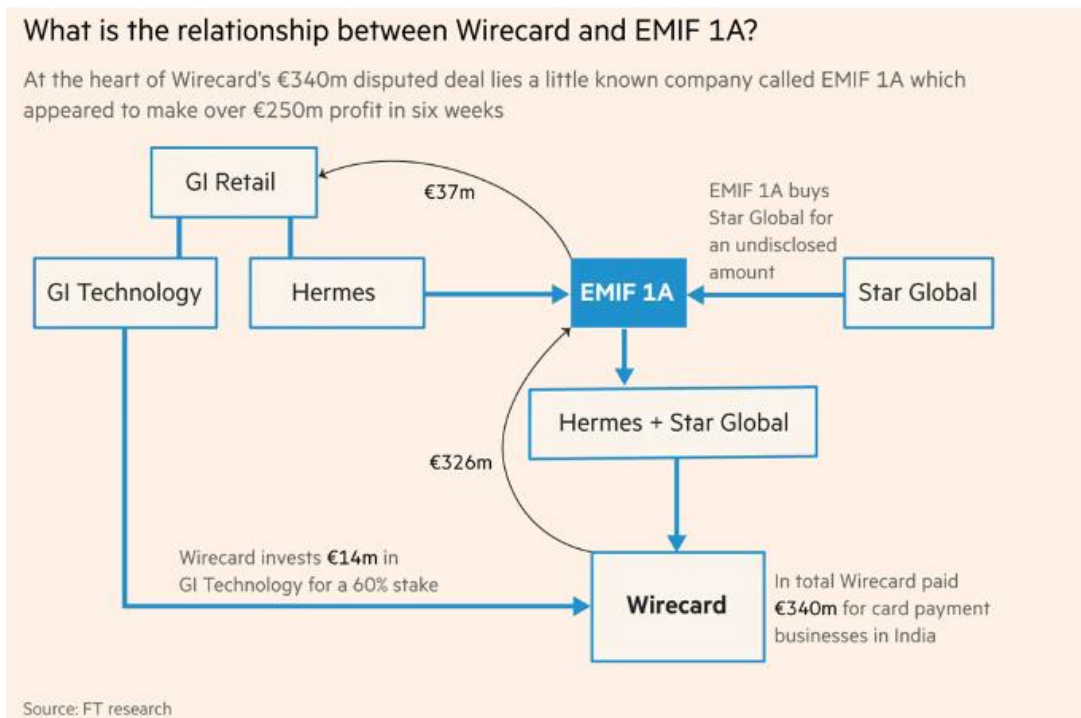


Figure 8: Wirecard's Largest Acquisition in India in 2015
Source: Financial Times

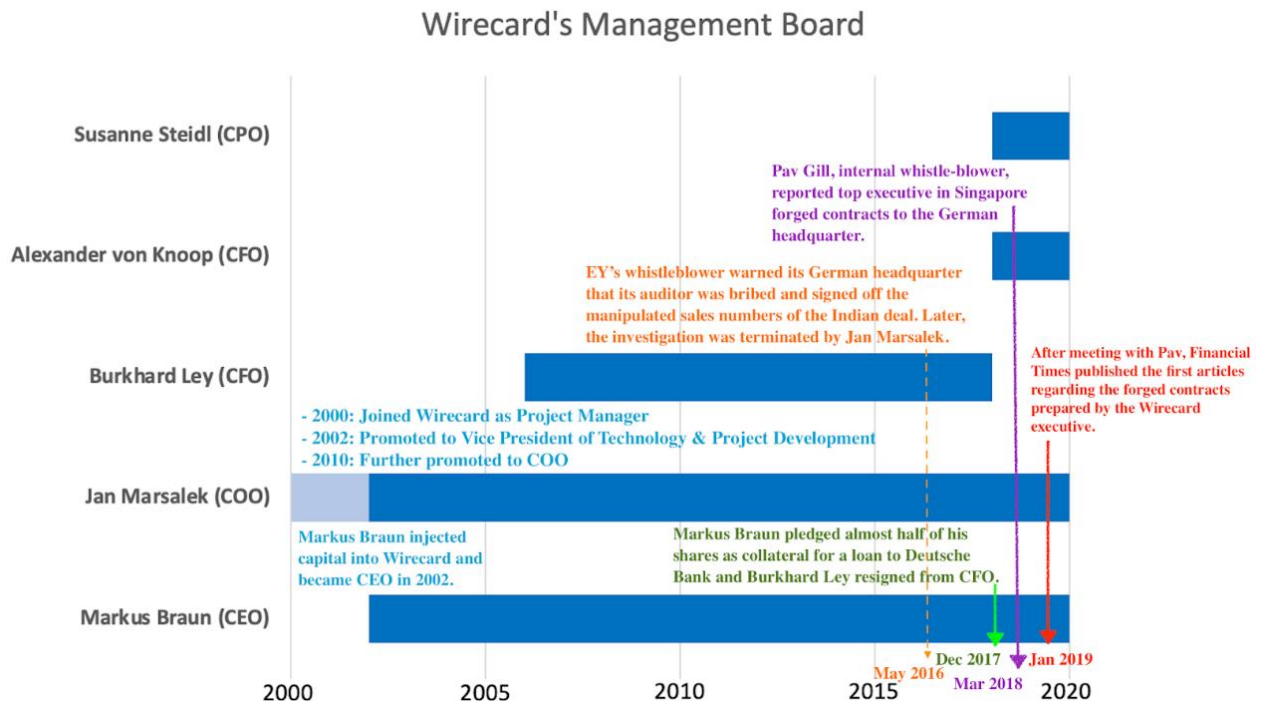


Figure 9: Wirecard's Management Board



Figure 10: Market Performance of Wirecard Stock
Source: Yahoo Finance and Investing.com

DAX Overview

i



DAX Overview

i



Figure 11: Market Performance of DAX30

Source: Investing.com

TABLES

Table 1: Wirecard's Supervisory Board

Year	Chair	Deputy Chair	Members
2008-2009	Wulf Mattias	Alfons Henseler	Paul Bauer-Schilichtegroll, Stefan Klestill
2010-2015	Wulf Mattias	Alfons Henseler	Stefan Klestill
2016	Wulf Mattias	Alfons Henseler	Stefan Klestill, Tina Kieingarn, Vuyiswa V. M'Cwabeni
2017	Wulf Mattias	Alfons Henseler	Stefan Klestill, Tina Kieingarn, Vuyiswa V. M'Cwabeni
2018	Wulf Mattias	Alfons Henseler	Stefan Klestill, Anastassia Lauterbach, Vuyiswa V. M'Cwabeni, Susana Quintana-Plaza

Source: Wirecard annual reports

Table 2: The Compensation Scheme of Management Board

Structure	Performance Criteria		Allocation	Target in 2018	
Performance-based remuneration	One-year variable compensation				
	Term	One year			
	Targeted performance	EBITDA growth		50%	20% growth
		Stock performance		50%	15% growth
	Capacity	Payment is limited to 150% of target bonus value			
	Multi-year variable compensation				
	Term	Three years			
	Targeted performance	EBITDA growth		33%	20% growth
		Stock performance		33%	15% growth
		Total shareholder return relative to TecDAX		33%	20% growth
Capacity	Payment is limited to 150% of target bonus value				
Non-performancebased remuneration	Base compensation	Annual compensation is distributed in 12 instalments			
	Fringe benefits	Non-cash perquisites and other benefits (e.g. private use of company care, refund of business-related travel and hospitality costs)			
	Retirement benefits	Fixed contribution to provide retirement benefits			

Source: S&P Capital IQ



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MS0092: Media As a Nonmarket Force in International Business: An Interdisciplinary Approach

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Media as a nonmarket force in international business: An interdisciplinary approach

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Extended Abstract

Multinational enterprises (MNEs) are facing increasing challenges from nonmarket forces. We examine how media as a nonmarket force can create political and social challenges for MNEs in an increasingly unstable international business (IB) environment. Such challenges require an interdisciplinary approach to studying MNEs' internationalization and the dynamics of government-media-business relationships. We propose four ways that media can cause import impact on MNEs. Further, differing from the mass communication perspective we provide alternative explanations to unpack the underlying mechanism of the media force. Finally, we discuss new research agendas for investigating the implications of media as a nonmarket force in IB.

Keywords: International business (IB), media, nonmarket force, mass communication

1. Introduction

Multinational enterprises (MNEs) are encountering more grand challenges and global disruptions, given that international business (IB) environment has been continuously disrupted by the increasing geopolitical rivalry between the US and China (Tung, Zander, & Fang, 2023). The ongoing geopolitical tensions also implies a rising nonmarket impact on MNEs (Witt, 2019), that scholars are paying more attention to investigating nonmarket dynamics and mechanisms in IB, not least in the context of emerging markets MNEs (Fjellström, Bai, Oliveira, & Fang, 2023). In the past decade, there has been an increasing academic interest among IB scholars to treat nonmarket factors as a key

part of MNEs' global strategy (Boddewyn & Doh, 2011; Cuervo-Cazurra, Inkpen, Musacchio, & Ramaswamy, 2014). However, prior work on MNEs' nonmarket environment has put intensive emphasis on business–government relationships (Sun, Doh, Rajwani, & Siegel, 2021) whereas media's relevance was largely ignored. Also, the role of the media as a nonmarket force faced by MNEs is a relatively underexplored area in existing research (Baron, 1995). We suggest that media can be an overlooked nonmarket force that shapes the dynamic of business–government relationship. Since media plays a pivotal role in the IB environment of MNEs, the interplay between media, politics, and business can significantly impact the internationalization of MNEs, presenting both challenges and opportunities.

2. Main Body

2.1. Main text

For MNEs, maintaining legitimacy in the host country is a process of keeping a “social license to operate” (Fiaschi, Giuliani, & Nieri, 2017, p.559). Deephouse (1996) argued that it is vital to frame two key social actors: one is government regulators, and the other is public opinion. In fact, it can be observed that there is increasing media coverage on MNEs, in which the firms' images are portrayed and constructed negatively (Zhang, Xu, & Robson, 2023). Massive negative media coverage on firm due to such (geo)political issues can be treated as black swan event, which comes as a surprise yet can be rationalized afterwards (Witt, Lewin, Li, & Gaur, 2023). The black swan-type stories can be fit with the interest of news media and thus amplified by news media and reaches a global audience. For example, during the period when Donald Trump wanted to ban TikTok in the US, *The New York Times* reported: “Whether it's TikTok or any of the other Chinese communications platforms, apps, infrastructure, this administration has taken seriously the requirement to protect the American people from having their information end up in the hands of the Chinese Communist Party” (The New York Times, 2020). Such a phenomenon is considered as being not only an economic challenge but also a political challenge for MNEs regarding reputation and legitimacy status. Thus, the media's role as a nonmarket actor, particularly in the context of geopolitical tensions, warrants further investigation.

Media is treated as the fourth estate of the civil society in the modern world. Business organizations are actors or citizens in the public sphere, that firms need to pursue corporate interests and meet the expectation within the civil society (Matten, Crane, & Chapple, 2003). Researchers from mass communication (MC) have a long tradition to study the impact of the media on issues related to social, political and economic phenomena (Entman, 1993; Tewksbury & Scheufele, 2019). Mass media plays an important role in shaping the public's perception toward firms as well as their reputation and legitimacy (Pollock & Rindova, 2003). Meanwhile, scholars in IB are paying more attention to civil society stakeholders as MNEs are now engaging more than ever with stakeholders that come from not only the business community but also a broader civil society. Research on media coverage of firms has spread across business disciplines, including management, accounting, finance, and marketing (Graf-Vlachy, Oliver, Banfield, König, & Bundy, 2020). However, research from these two areas still has limited connections, although they are often studying similar phenomenon and address relevant research problems. Thus, an inter-disciplinary approach is needed to combine the knowledges from the two relatively isolated areas together, thereby generating more comprehensive understanding on the shared research questions. Through an inter-disciplinary approach, this study aims to bridge the theories of international business management and media research, which echoes the call for generating disruptive knowledge in IB research (Tung, Knight, Ghauri, Prashantham, & Fang, 2023).

Thus, this study aims to investigate the impact of the media as a nonmarket force on MNEs in a more geopolitics-involved IB environment. The purpose of this research is to bridge the literature on IB and that on MC and discuss future research agenda. In the following of the paper, we will firstly review how MNEs' media coverage are studied in existing IB literature, then we leverage concepts and theories from MC literature to further examine the role of the media in the business environment, including the function of news media, media content production, media content distribution, and media content consumption. Finally, we propose four further research directions on studying the media as a nonmarket force in IB (see Figure 1), which links with media power, de-globalization, nonmarket strategy and soft power.

2.2. Figures and Tables

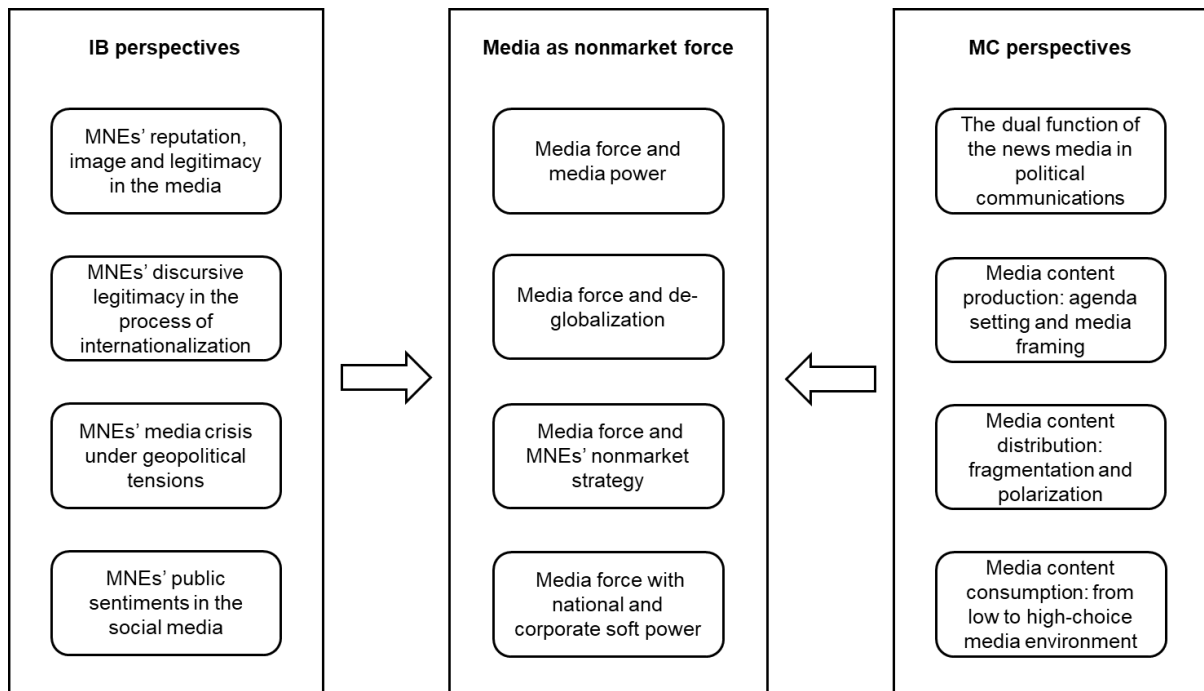


Figure 1: Four dimensions of media force in IB

3. Conclusion

There is a widely acknowledged consensus among IB scholars that nonmarket forces are becoming more than ever important for affecting MNEs (Tung et al., 2023), the international business—government relationship still dominates the nonmarket strategy literature (Sun et al., 2021). Although media data have been used more frequently in the IB studies, extant literature shows a relatively limited and narrowed attention on the relationship between the media and MNEs. Thus, this study fills the research gap to illustrate why and how the media can be an important nonmarket force in the IB context. Understanding the media as a nonmarket force provides valuable insights into how public opinions are shaped, political discourse is framed, and the broader implications for understanding MNEs' challenges in the changing IB landscape.

Through an inter-disciplinary lens, this study enriches knowledge on media coverage and shows how the media can be a part of MNEs' institutional environment. IB researchers need to understand the

business realities from a broader social and political perspective. Seeing more geopolitical tensions globally, it is imperative to go beyond traditional business and economic lens to scrutinize the complexities of MNEs' image and legitimacy. Further, this study contributes to connect MNEs with civil society more closely, by looking at the media as a key stakeholder and nonmarket force. This study contributes to the existing nonmarket strategy literature by extending the dominant business–government relationship to business–media–government relationships, which reflects the multifaceted nature of MNEs' nonmarket environments. Last but not least, this study can serve to pave the path for more cross-discipline research, by articulating key concepts, articulating theoretical boundaries, and setting a future agenda with a number of interesting research questions being raised. Finally, policymakers could benefit from this study by gaining knowledge about the media's role in shaping the global business environment, and get a better understanding on national and corporate soft power.

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MS0093: The Antecedents and Consequences of UN Sustainable Development Goals in Firms

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The Antecedents and Consequences of UN Sustainable Development Goals in Firms

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Extended Abstract

How do firms engage with the UN Sustainable Development Goals (UN SDGs)? What drives them to do it, and what are the results of their efforts? This study uses a quantitative method to measure and explore how firms engage with the UN Sustainable Development Goals (UN SDGs) from MNCs across four different countries, Sweden, Australia, Indonesia and India, and whether it affects both corporate social and firm performance.

Keyword: UN Sustainable Development Goals (UN SDGs), Resource-based view, Dynamic Capabilities Theory, corporate social performance, firm performance

1. Introduction

There has been a recent drive by firms to extend their purpose beyond profit-making to create societal good and environmental impact on the community. The UN SDGs provide a standard yardstick for firms to implement these challenging yet globally recognized goals. However, there is limited knowledge of the antecedents for firms to adopt UN SDGs and, more importantly, the outcomes of such practices. This study aims to bridge this gap, offering potential insights that could significantly enhance our understanding of sustainable business practices.

2. Literature and framework

The Resource-Based View (RBV) of the firm provides a theoretical basis for understanding how firm capabilities can influence the implementation of SDGs. The RBV posits that firms possess unique resources and capabilities that enable them to gain competitive advantages (Barney, 1991). In the context of SDGs, these capabilities could include technological capabilities, human resource capabilities, and organizational capabilities, among others. Additionally, introduced by Teece, Pisano, & Shuen (1997), Dynamic Capabilities Theory (DCT) emphasizes the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. This is particularly relevant in

context of SDGs, which require firms to adapt and innovate in response to complex and evolving sustainability challenges.

3. Method

This study uses a survey to empirically study the relationship between firm capabilities, the implementation of Sustainable Development Goals (SDGs), and subsequent corporate social and firm performance in multinational corporations (MNCs) from four countries: Sweden, Australia, Indonesia, and India. This selection is based on the need to study the differential impacts of UN SDGs implementation and the challenges MNCs may face across developed and developing nations.

Measures of the survey will include a) firm capabilities, 2) market disruptiveness capabilities (Bhattacharai et al., 2019), Organizational Learning (Mikalef et al., 2019), 3) corporate social and firm performance measures, and comparing relational differences across developed and developing countries.

4. Discussion

The ultimate goal of this study would likely be to provide insight and guidance to multinational firms looking to implement SDGs in a manner that enhances their performance, while also contributing to broader global sustainability efforts. The outcomes of this research aim to find which firm's capabilities affect the implementation of SDGs, how this affects corporate social and firm performance in MNCs, and whether there are any differences in how firm capabilities affect SDG implementation and performance outcomes. Finally, country differences between developing and developed countries are also compared and assessed.

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MS0094: Digital Capabilities As a Moderating Role in SME Internationalization

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Digital capabilities as a moderating role in SME Internationalization

Extended Abstract

Digital capabilities are primarily viewed as a driver, with limited consideration as a contextual element, outcome, or moderator/mediator in the research of internationalization. There is limited discussion analyzing the role of digital capabilities with country-level factors within the context of internationalization. Therefore, this study delves into the context of country-level barriers, that is cultural distance, encountered during internationalization. The study views digital capabilities as a moderator when internationalizing under the barriers of cultural distance. The study posits that digital capabilities can alleviate the negative influence of cultural distance on internationalizing.

Keyword: Digital capabilities, Internationalization, Cultural distance

1. Introduction

Digital capabilities are primarily viewed as a driver, with limited consideration as a contextual element, outcome, or moderator/mediator in the research of internationalization (Reim et al., 2022). There is limited discussion analyzing the role of digital capabilities with country-level factors within the context of internationalization. Therefore, this study delves into the context of country-level barriers, that is cultural distance, encountered during internationalization. The study views digital capabilities as a moderator when internationalizing under the barriers of cultural distance. The study posits that digital capabilities can alleviate the negative influence of cultural distance on internationalizing.

The relationship between internationalization and digital capabilities is generally positive, with various elements of digital capabilities supporting internationalization (Kotha, Rajgopal, & Rindova, 2001; Bianchi & Mathews, 2016). In some studies, internationalization was the primary focus, with digitalization serving merely as the context (Deng & Wang, 2016; Chen, Shaheer, Yi, & Li, 2019). In contrast, other studies viewed internationalization as a contextual factor for examining digitalization dynamics (Mikalef & Pateli, 2017; Wentrup, Nakamura, & Ström, 2019).

In this context, it is evident that digital capabilities have emerged as a prominent trend in the current business, and acquiring digital capabilities becomes significantly crucial. However, there are several research gaps from the previous literature. First, the literature lacks comprehensive understanding of digital capabilities in the field of facilitating the SMEs internationalization journey, which is distinct from the approach taken by MNEs. The current literature predominantly focuses on the deployment of digital capabilities in large enterprises, providing few detailed insights into SMEs. Second, there is limited discussion analyzing the role of digital capabilities at country-level, within the context of internationalization.

The research aims to determine whether digital capabilities have positive effect on SME internationalization, and how can digital capabilities alleviate the traditionally negative effects of this barrier. By addressing these research issues, this thesis aspires to contribute exploration into the

multifaceted relationship between digital capabilities and the endeavors of SMEs internationalization.

2. Literature and hypothesis

- Ownership advantages as an approach to overcome cultural distance challenges

Dunning's OLI theory (the eclectic paradigm) posits that firms can achieve success in foreign markets by possessing specific ownership advantages that mitigate the difficulties linked with the liability of foreignness (Dunning, 1981; Dunning, 1988). The paradigm posits that firms possessing these ownership advantages can effectively manage organizational costs linked with transnational distances, particularly when these assets or capabilities are inimitable and valuable. Among the crucial firm-specific assets for firms, technological capability holds importance (Barnard, 2010; Rabbiosi, Elia, & Bertoni, 2012). The superior technological capabilities serve as the main source of its ownership advantage in a firm (Buckley and Casson, 1976). These capabilities enable the firm's subsidiaries to make more creative inventions at cheaper prices than local competitors. Firms with strong technology assets are better positioned to navigate the challenges posed by cross-national distances, with a particular emphasis on one of a source of competitive advantage—technological capabilities.

Similarly, SMEs having advanced digital capabilities is crucial for gaining a competitive advantage (Li, Su, Zhang, & Mao, 2018; Cenamor et al., 2019). For SMEs with strong digital capabilities, they can navigate challenges related to cross-border operations more effectively. For instance, the transaction costs occurred when there are differences between countries in diverse dimensions may be compensated for through fast adaptability, localization, and customized innovative products in niche markets (Mariotti & Piscitello, 2001).

- Cultural distance and SME internationalization

Cultural distance is the degree of variance between norms, beliefs, values, and assumptions in one country compared to another (Kogut & Singh, 1988; Hofstede, 2001). A greater cultural distance implies a more significant disparity in managerial and organizational practices at the firm level (Kogut & Singh, 1988; Hofstede, 2001). First, the existence of cultural distance increases the likelihood of information asymmetry, which then will lead to a growth in monitoring costs (Morschett, Schramm-Klein, & Swoboda, 2010). When a firm transferring capabilities to a culturally disparate host country is considered a challenging endeavor, as it is often linked with a large amount of learning costs in a new market (Morschett et al., 2010). The prevailing perspective in the prior literature suggests that cultural distance has negative impact due to the uncertainty and complexity of conducting business in a remote host country. Second, cultural distance can increase transaction costs by introducing complexities in communication, coordination, and relationship management (Park & Ungson, 1997). Firms facing significant cultural distance may incur more amount of transaction costs because of extensive communication, adaptation of contracts and agreements, and resolution of misunderstandings (Dellestrand & Kappen, 2012). Third, cultural distance extends to consumer behavior, affecting preferences, buying habits, and expectations (De Mooij & Hofstede, 2011). Firms may struggle to understand and cater to the diverse needs of consumers in different cultural contexts,

potentially resulting in market entry difficulties.

There are several aspects that cultural distance might be an even more serious factor for SMEs. The first aspect is resource constraints. Compared with MNEs, MNEs with larger budgets and more extensive resources allow them to allocate significant resources to overcome cultural challenges. They may have dedicated teams, consultants, and sophisticated cross-cultural training programs to address cultural issues. As for SMEs, limited resources can magnify the impact of cultural distance for SMEs (Lu & Beamish, 2001). SMEs may face challenges in investing heavily in cross-cultural training, market research, and adaptation strategies. The second aspect is foreign network. Building relationships may be more critical for SMEs, and they may face challenges in gaining the trust of local partners due to their smaller scale and potential lack of recognition in international markets. The third aspect is localization of operations. Limited resources may restrict the ability of SMEs to establish physical offices or production facilities in multiple countries, potentially limiting their ability to fully localize operations. Moreover, managing a culturally diverse workforce may be challenging for SMEs due to their smaller teams and limited expertise in cross-cultural management.

In short, cultural distance leads to increased information asymmetry, heightened monitoring costs, challenges in transferring capabilities to culturally dissimilar host countries, introducing complexities in communication and relationship management, resulting in negative performance consequences. Cultural distance poses a more significant challenge for SMEs due to resource constraints, limiting their ability to invest extensively in cross-cultural training, market research, and adaptation strategies, as well as facing hurdles in building foreign networks, establishing physical offices in multiple countries, and managing culturally diverse workforces. Therefore, this study develops the following hypothesis.

H1: Cultural distance has a negative impact on SME internationalization.

- Digital capabilities as a moderator

This study suggests that digital capabilities weaken the negative relationship between cultural distance and internationalization. Digital capabilities empower SMEs to engage in business across diverse markets, effectively overcoming the challenges associated with cultural distance through various approaches.

First, for SMEs with limited budgets, digital capabilities provide a cost-effective means by using digital tools to establish a global presence and access international markets without the substantial investments required by MNEs (Katsikeas, Leonidou, & Zeriti, 2019; Elia, Giuffrida, Mariani, & Bresciani, 2021). For instance, by adopting local social media channels and employing digital marketing strategies, SMEs can promote their products or services in a cost-effective manner, facilitating connection and information delivery to a global audience in culturally different ways. This proactive promotion enables SMEs to increase the depth of their internationalization efforts.

Second, digital capabilities empower SMEs to successfully enter new markets characterized by cultural distance. The strategic use of analytical tools, big data collection methods, and digital platforms equips firms with valuable insights into customers' preferences, attitudes, habits, and interests (Katsikeas et al., 2020). This digital advantage allows SMEs to adeptly navigate cultural

barriers and seize international opportunities with greater flexibility compared to larger, more bureaucratic MNEs (Jin & Hurd, 2018; Katsikeas et al., 2020). Recognizing innovation as a key competitive advantage for SMEs (Quaye & Mensah, 2019), these businesses can leverage digital capabilities to swiftly customize their products and services based on real-time insights into local preferences. By offering the specific needs and cultural difference of diverse markets, SMEs develop the abilities in multiple foreign countries to do business, thereby broadening the scope of internationalization.

Third, SMEs can leverage IT systems (e.g., ERP, CRM) to build communities around niche markets (Olsen & Saetre, 2007). The capability to utilize digital capabilities and adopt digital technologies emerges as a pivotal competitive instrument for SMEs. These digital tools provide indispensable support for the generation of value and the engagement of customers, which are two of the most crucial success factors for SMEs (Matarazzo, Penco, Profumo, & Quaglia, 2021). For instance, SMEs can fortify relationships with customers and stakeholders in specific cultural contexts, enhancing their market presence. In the context of international expansion, SMEs can optimize employee utilization by seamlessly sharing and monitoring information through IT systems when establishing subsidiaries and offices overseas. This approach allows SMEs to expedite the establishment of foreign subsidiaries, overcoming traditional barriers with increased efficiency.

Fourth, managing foreign employees due to cultural distance poses a critical challenge for SMEs, particularly because of their heavy reliance on local human resources (Horváth & Szabó, 2019). Many SMEs leverage digital capabilities, such as video conferencing, immediate information through IT systems and visualized standard operating procedure (SOP), to effectively address human resource problems (Horváth & Szabó, 2019). In contrast, MNEs enjoy greater flexibility in talent sourcing on a global scale. Alternatively, faced with inadequate human resources in a specific region or country, MNEs can choose to relocate their production activities to another region, a strategic advantage not as readily available to SMEs.

Being particularly resource-constrained, SMEs can benefit significantly from digital capabilities as they help to overcome cultural distance when internationalizing. In other word, SMEs with higher digital capabilities can suffer less about cultural distance when internationalizing. Therefore, this study develops the second hypothesis.

H2: Digital capabilities weaken the negative relationship between cultural distance and internationalization.

3. Method and results

The study conducted surveys with 1000 SMEs in Taiwan from September to December 2022, utilizing both paper and online survey methods. The sample design incorporated random selection within clusters, considering 22 administrative districts and fields of activities. A total of 290 surveys were returned. The response rate is 29%, and it meets the standard of an acceptable response rate (Baruch, 1999). Following the scrutiny of incomplete responses, 208 surveys remained. The sample composition reflects a diverse representation of industries, with the top five sectors accounting for

varying proportions. The wholesale and retail trade sector constitutes the biggest segment, comprising 17% in the sample. Following closely are the electrical and electronic components manufacturing sector, representing 14% of the sample. The metal products and machinery manufacturing and repair industry occupies the third position, comprising 11% of the sample. Furthermore, the information and communication services sector is represented at 9%. According to the descriptive statistics, the average firm age is 30 years old in the sample. The average firm size is 6.269, signifying sales in the range of 60 to 70 million New Taiwan dollars. There were 108 firms in the manufacturing industry, and the remaining firms were in the service industry.

In this study, the dependent variable, internationalization, refers to export ratio. Exporting is one of the most common strategies for SMEs to internationalize (Wolff & Pett, 2000) and one of the most common measure of internationalization (e.g., Westhead, Wright, & Ucbasaran, 2001; Hessels & Parker, 2013; Hagsten & Kotnik, 2017). The export ratio refers to the country which corresponds to the cultural distance unit of analysis. Cultural distance is quantified by a five-item survey employing a five-point Likert scale based on Kogut and Singh (1988), with the resulting score being the sum of the responses. The survey requests that managers indicate the cultural distance to the primary selling country (Luo, 2002). Based on previous studies (e.g., Zhou & Wu, 2010; Khin & Ho, 2018; Mikalef & Gupta, 2021; Proksch et al., 2024), this research defines digital capabilities as the abilities of a firm to select, orchestrate, and leverage its digital resources. Consistent with earlier studies (Mikalef & Gupta, 2021; Heredia et al., 2022; Proksch et al., 2024), the study employed seven survey questions and calculated the total score utilizing a five-point Likert scale. Control variables encompassed industry type, firm age, and firm size.

The empirical methodology adopted in this study seeks to investigate the moderating influence and assess the relationship of cultural distance and internationalization. Given that the dependent variable is continuous in nature, this research adopts a multiple regression model to examine the stated hypotheses.

It is observed that cultural distance is negatively related to internationalization, thus supporting H1 ($p < 0.01$). SMEs equipped with higher digital capabilities positively moderate the relationship between cultural distance and internationalization ($p < 0.05$), indicating support for H2. In other words, digital capabilities weaken the negative relationship between cultural distance and internationalization. SMEs can benefit from digital capabilities as they help overcome cultural distance when internationalizing. The study conducted one robustness test as the following. Overall, the results remain the same. To conduct a robustness test, this study measured construct of cultural distance, using the Mahalanobis distance index proposed by Berry et al. (2010). This study used the top three main foreign markets as the components.

Results of hypotheses

Internationalization	Model 1	Model 2	Model 3
Firm age	0.136*(0.078)	0.155*(0.089)	0.150**(0.089)
Firm size	2.696***(0.802)	2.156**(0.937)	2.256**(0.940)
Industry type	6.100*(3.468)	6.578(3.940)	6.058*(3.325)
Cultural distance (CD)		-0.508****(0.601)	-1.428****(1.010)
Digital capabilities (DCs)		0.213**(0.180)	0.823*(0.934)
CD*DCs			0.058****(0.051)
Constant	5.999****(0.284)	18.155*(10.714)	33.220**(17.083)
F statistic	8.280***	8.560***	3.650***
R ²	0.079	0.174	0.203
ΔR^2	0.070	0.154	0.167
Root MSE	1.240	1.170	1.161

*p<0.1 **p<0.05 ***p<0.01
Standard errors in parentheses.
N=208

Results of robustness test

Internationalization	Model 1	Model 2	Model 3
Firm age	0.015****(0.003)	0.015****(0.003)	0.014****(0.004)
Firm size	0.006(0.023)	0.009(0.021)	-0.003(0.023)
Industry type	0.295*(0.065)	0.235(0.059)	0.198(0.099)
Cultural distance (CD)		-0.006(0.205)	-1.435*(0.778)
Digital capabilities (DCs)		0.026****(0.006)	0.045*(0.039)
CD*DCs			0.029*(0.016)
Constant	-1.750****(0.287)	-3.007****(0.650)	-0.194(1.912)
F statistic	6.82***	9.550***	6.500***
R ²	0.088	0.191	0.228
ΔR^2	0.075	0.171	0.192
Root MSE	1.261	1.124	1.109

*p<0.1 **p<0.05 ***p<0.01
Standard errors in parentheses.
N=208

4. Discussion and conclusion

Echoing previous studies discussing whether cultural distance matter nowadays (Beugelsdijk et al., 2018), this study suggests that cultural distance still matters today. The concept of cultural distance origins from MNEs, and this study highlights why cultural distance might be an even more serious factor for SMEs. However, from the development of various capabilities, not only MNEs but also SMEs can try to overcome this barrier. Extending this theoretical foundation to the context of SMEs, the study emphasizes the critical role of advanced digital capabilities in gaining a competitive advantage (Cenamor et al., 2019). For SMEs equipped with strong digital capabilities, the ability to navigate challenges related to cross-border operations becomes more effective.

This study underscores the contemporary relevance of digital capabilities for SMEs, aligning with the eclectic paradigm's emphasis on ownership advantages. SMEs with advanced digital capabilities are better positioned to address the complexities of internationalization, leveraging their adaptability and innovation in response to cross-national challenges. This discussion contributes to the literature by bridging the traditional perspectives on technological capabilities with the evolving context of digital capabilities, providing insights for both theory and practice.

A precise definition of digital capabilities is provided, referring to the capabilities of a firm in the strategic selection, orchestration, and utilization of its resources specific to the digital domain. In this context, digital capabilities are considered ownership advantages, serving as a strategic approach to address and overcome challenges associated with cultural distance.



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MS0095: Value Chain Activities, Digital Capabilities and SME Internationalization

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Extended Abstract

This study exploring how digital capabilities are deployed to influence internationalization, from internally within a firm (intra-organization) and across different firms (inter-organization). This facet aims to unravel the dynamics involved in utilizing digital capabilities at the organizational level to shape and enhance the internationalization process. There are two research questions: (1) How do SMEs deploy digital resources to create digital capabilities on various value activities? (2) Which value activities should SMEs prioritize in their digital resource deployment efforts with the aim of enhancing their internationalization? This study aspires to contribute exploration into the multifaceted relationship between digital capabilities and the endeavors of SMEs internationalization.

Keyword: Value chain activities, digital capabilities, internationalization

• Introduction

Digital capabilities represent a supplementary or alternative means of entering international markets (Olejnik & Swoboda, 2012; Sinkovics et al., 2013; Jin & Hurd, 2018). Embracing digital capabilities like big data analytics, artificial intelligence and information technology systems can help to reduce commercial barriers and entry costs associated with engaging in international markets. These capabilities provide an additional avenue for the establishment of commercial relationships, the marketing of products and services, the generation of sales leads, and the acquisition of insights into foreign competitors and markets (Freund & Weinhold, 2004; Bianchi & Mathews, 2016). Moreover, advancements in digital capabilities can be leveraged to enhance connectivities with business partners and stakeholders, thereby facilitating integration into emerging global value chains (Jean et al., 2010). In particular, SMEs stand to gain substantial benefits from developing digital capabilities since they can help overcome traditional barriers to internationalization linked to limited firm size and challenges in committing financial and human resources (Houghton & Winklhofer, 2004; Tseng & Johnsen, 2011).

The research gaps are evident in the predominant focus of existing studies on the digital capabilities of multinational enterprises and large firms (Eller, Alford, Kallmünzer, & Peters, 2020). In contrast, SMEs face resource constraints, hindering the development of comprehensive digital capabilities. Hence, it is important to investigate the tangible aspects of SMEs across their entire value

chain, providing insights for resources allocation. This involves describing SMEs in a way that accurately reflects their digital capabilities in alignment with their specific organizational context (Eller et al., 2020; Schneider & Kokshagina, 2021). This research addresses the aforementioned gaps by conducting an in-depth examination of the practical facets of SMEs throughout their entire value chains. It seeks to characterize SMEs accurately, enabling understanding and assessment of their digital capabilities in alignment with their organizational realities. Building upon prior work by Oliveira et al. (2021), this study emphasizes the importance of developing digital capabilities within the value chain. Aiming for comprehensiveness, the study explores how SMEs strategically navigate their complete value chains and investigate optimal resource allocation strategies for the efficient implementation of digital capabilities. This research further explores the impact of digital capabilities across various value activities on the internationalization of SMEs.

- **Literature and framework**

In recent decades, a large amount of academic research has focused on exploring digital capabilities. However, while the research has predominantly concentrated on large-scale firms, manufacturing entities, industrial contexts, and data analytics, the exploration of small businesses has remained comparatively restricted in this discourse (Hausberg, Liere-Netheler, Packmohr, Pakura, & Vogelsang, 2019; Eller et al., 2020). A lot of researches have demonstrated the pivotal role of digital capabilities as either alternative or supplementary channels for entering international markets (Sinkovics et al., 2013; Katsikeas et al., 2020). By diminishing entry barriers and associated costs, digital capabilities are poised to surmount commercial impediments associated with global market participation. This in turn establishes an additional conduit for forging commercial linkages, executing marketing and sales endeavors, and facilitating the acquisition of insights into potential competitors and foreign markets (Bianchi & Mathews, 2016). Moreover, the ongoing advancements in digital capabilities offer a strategic lever for augmenting connectivity with business partners, customers, distribution networks as well as suppliers, while concurrently facilitating seamless integrations within burgeoning global value chains (Javalgi & Ramsey, 2001; Jean et al., 2010; Chen et al., 2021). The possible benefits stemming from the digital capabilities for SMEs could prove more pronounced. These digital capabilities hold the promise of alleviating the customary challenges tied to internationalization, particularly those related to firm dimensions and limitations in committing human and financial resources (Tseng & Johnsen, 2011).

A study by Oliveira, Fleury, and Fleury (2021) examines the potential impact of digitization on the power relationships that constrain the upgrading of SMEs within global value chains. The research investigates three key factors, asset-specificity, market disintermediation, and sources of innovation, which influence upgrading constraints. The concept of digital power is explored through a multiple case study approach, which illustrates the potential disparity in power imbalance that suppliers may encounter in comparison to lead firms when operating in value chains with varying degrees of digitization. The digitization of value chains enables SMEs to pursue process and product upgrades independently, facilitating the simplification of transactions via the usage of digital technologies. This

independence enables SMEs to experiment with new business models and value drivers, facilitating product development efforts or the internalization of new functions. Furthermore, digital convergence and generativity contribute to the enhanced autonomy of SMEs within fully digitized value chains, providing opportunities for product development and advancement beyond what is achievable in partially digitized chains.

- **Method and results**

This study uses the Uppsala Internationalization Model to frame the interview outline (Johanson & Vahlne, 1977), which suggests a gradual and incremental approach to internationalization. The general stages are: no regular export activities, export via independent representatives, establishment of a sales subsidiary/ production facilities. Following previous studies (e.g., Avram & Kühne, 2008; Noke & Hughes, 2010; Epede & Wang, 2022), this study adopts the Porter's (1985) value chain, which is suggested that may be used for searching applications regarding digital capabilities (Soto-Acosta, 2020). Primary activities include logistics, operations, marketing and sales, and service. Support activities include firm infrastructure, human resource management, technology development and procurement. The study categorizes digital capabilities into three levels (Sezer, Thunberg, & Wernicke, 2021). Low digital capabilities refer to full labor of manual data acquisition, paper data, paper analysis, paper report. For example, the firm's business mainly relies on paper, email, manual input data, or simple word processing software, such as word, excel. Medium digital capabilities refer to digital plus manual like digital query and manual interpretation, manual input of electronic data, manual operation of software analysis, manual distribution of electronic reports. For example, the firms use online platform, official website for business display and sales, and using ERP, Manufacturing Execution System (MES), CRM and Supply Chain Management (SCM). High digital capabilities refer to full digitization like digital acquisition of data, automatic input of data, automated software analysis, automatic output of reports. For example, the firms use Internet of Things, artificial intelligence, big data, cloud computing, additive manufacturing (3D printing technology), real-time system integration system, intelligent warehouse management system and manufacturing scheduling system.

This study collected these data from six manufacturing SMEs in Taiwan from February to November 2023. Each interview lasted 90 to 120 minutes. In the interview process, the first part is to understand the internationalization stages the firm has gone through since its establishment. The second part is to comprehend how the firm has applied digital capabilities in various value activities at different stages to facilitate internationalization. This study adhered to the official criteria for identifying SMEs, as defined by the Standards for Identifying Small and Medium-sized Enterprises in Taiwan. The term SME within these standards denotes an enterprise that has undergone company registration or business registration in compliance with relevant laws. Specifically, an SME is characterized by a paid-in capital not exceeding NT\$100 million or having fewer than 200 regular employees.

Code	A	B	C	D	E	F
Name	Dinkle	Grand Dynasty	Fomed Biotech	Solen Electric	Ming Fong	Techman Robot
Established year	1983	1984	1978	1985	1984	2016
Employee	200	200	90	160	120	360
Export ratio	90%	98.8%	50%	95%	60%	90%
Capital	320 million	190million	200 million	250 million	60 million	900 million
Revenue per year	250 million	1.2 billion	550 million	2.55 billion	150 million	1.5 billion
Foreign subsidiary/office	5	1	7	3	1	6
Region of subsidiary/office	3	1	1	1	1	5
Exporting countries (approximately)	50	10	70	30	10	50
Main products	Terminal Block	Plastic Injection Mold; Mechanical design; Mold Development	Dental Medical Equipment	Electromagnetic Critical Components; Automatic Controllers	Mold Manufacturing; Injection Molding	Collaborative Robot Arm
Winning award	D&B Top 1000 Elite SME Award	Outstanding Excellence Award; Taiwan SME Social Responsibility Award; Global Top 100 Technology R&D Award	N.A.	Rising Star Award; National Award of Outstanding SMEs; Overseas Community Award of Outstanding SMEs; National Quality Award	Taiwan Excellent Manufacturer Award; Outstanding Business Award	Taiwan Excellence Award; Red Dot Design Award; iF Design Award
Digital capabilities vs the industry	high	medium to high	medium to high	high	medium to high	high

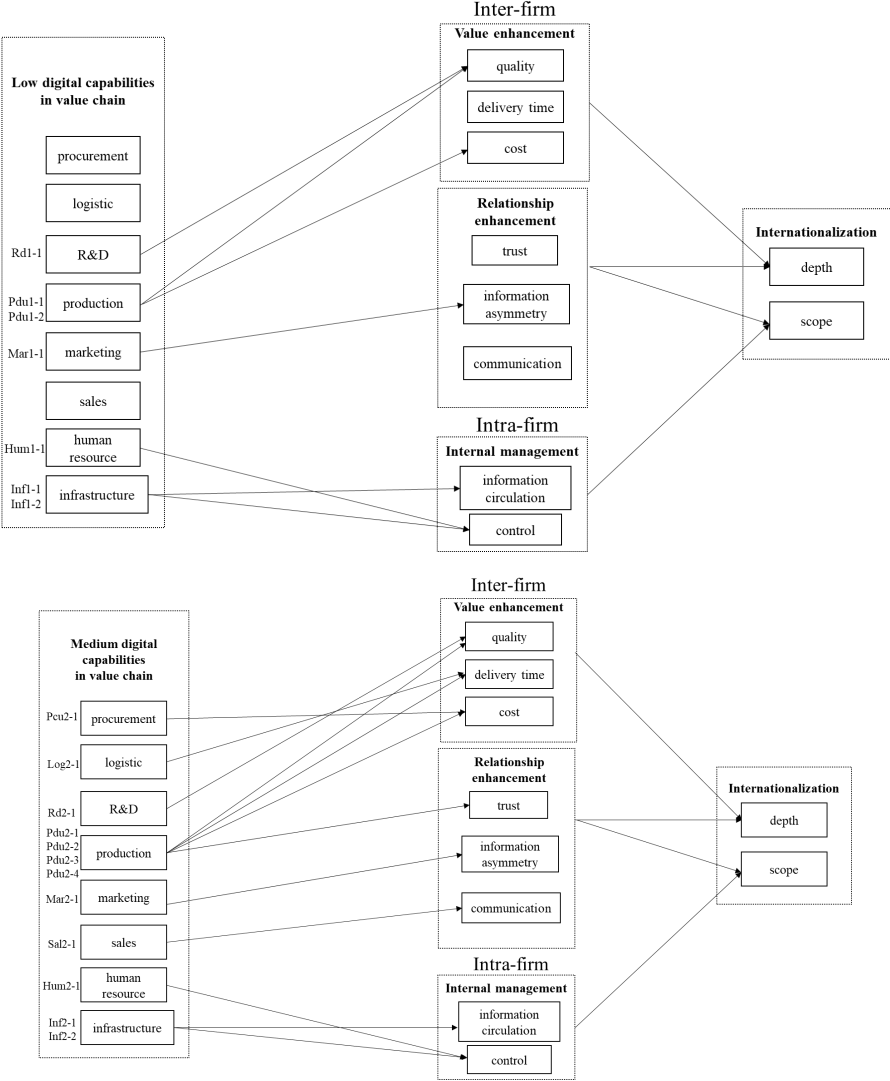
The analysis of case studies divides internationalization into two aspects: the depth of internationalization and the scope of internationalization. In this study, the depth of internationalization is defined as the export ratio and foreign direct investment (FDI). FDI represents a commitment of resources to foreign markets, which typically involves a deeper involvement compared to other forms of internationalization such as exporting (Gaur, Kumar, & Singh, 2014). This deeper involvement includes the establishment or acquisition of production facilities, which involves significant investment and strategic planning. This study defines the scope of internationalization as the number of export markets and number of countries in which subsidiaries are located (Crick, 2009).

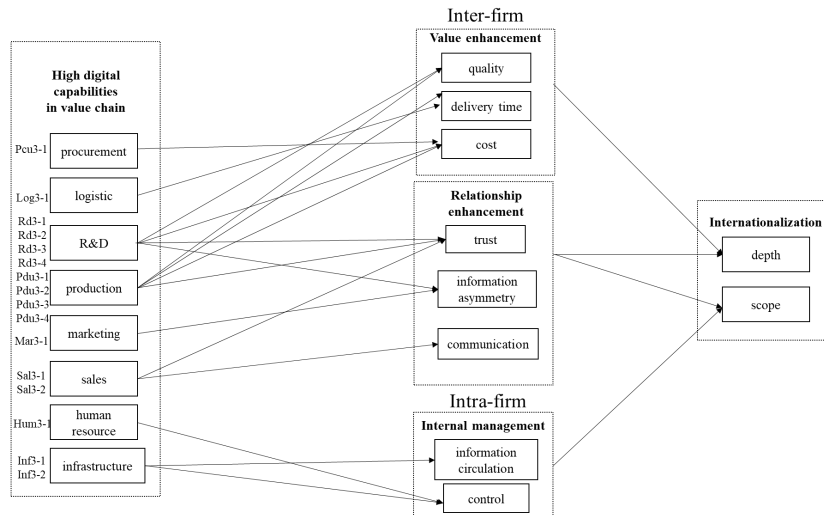
First, this study discusses the relationship between digital capabilities in value activities and the depth of internationalization. The research shows that SMEs primarily enhance their digital capabilities in areas such as research and development (R&D), production, marketing, sales, and after-sales service to increase their export ratio. By improving digital capabilities in R&D activities, they can swiftly and accurately respond to the host country's market demands, transmitting signals of outstanding capabilities and quality. Enhanced digital capabilities in production activities allow them to maintain control over production quality without being constrained by location, improving on-time delivery rates, and aligning with advanced systems of overseas major customers to build trust. Increased digital capabilities in marketing activities reduce search costs for overseas customers and mitigate information asymmetry. Enhanced digital capabilities in sales and after-sales service activities enable immediate feedback from host country customers and resolution of overseas customer issues. Through the above approaches, firms gradually increase the export ratios and the establishment of foreign subsidiaries.

Second, this study discusses the relationship between digital capabilities in value activities and the scope of internationalization. The research indicates that SMEs primarily utilize digital capabilities in administrative processes and human resource management as auxiliary roles in internationalization. This is achieved through internal control and information flow, creating job position replication systems through digital systems. These capabilities help overcome the obstacles posed by insufficient human resources during international expansion, thus expediting the establishment of foreign

subsidiaries and increasing the number of export markets.

After the interview, all firms did not link digital capabilities of the firms directly to internationalization, which fill the research gap that prior researches (e.g., Denicolai, Zucchella, & Magnani, 2021) may not deeply capture the picture. According to the interviews, digital capabilities are applied to value activities, creating three mediators (value enhancement, relationship enhancement, internal management) that influence the scope and depth of internationalization.





Proposition	Research Conclusion	Research Finding
<p>P1. Comparing to supporting value activities, firms enhancing digital capabilities in the primary value activities (e.g., procurement, logistics and R&D) can strengthen inter-firm value enhancement, thus improving the depth of internationalization.</p>	<p>1-1. Enhancing digital capabilities in procurement and logistics enables small and medium-sized manufacturing firms to meet delivery times, cut costs, and provide clients with detailed information, anticipating a future increase in export volumes and establishment of foreign subsidiaries.</p>	<p>1-1-1. Small and medium-sized manufacturing firms improve their digital capabilities in procurement activities through the implementation of ERP systems and the use of visual indicators. This enables teams and supervisors to accumulate data on procurement quantities and order details, facilitating the swift establishment of benchmarks for identifying alternative suppliers based on specific criteria. The adjustment of the bill of materials is guided by historical production consumption data, ensuring greater precision in the procurement quantity for new orders and minimizing wastage. Consequently, these firms can meet delivery times, reduce costs, and satisfy clients, leading to an anticipated increase in export volumes in the future.</p>
		<p>1-1-2. Small and medium-sized manufacturing firms enhance their digital capabilities in logistics activities by adopting ERP systems, barcoding, and utilizing robotic arms, effectively reducing errors and saving time. This enables teams to readily access real-time inventory information, improving communication with customers about shipment statuses and stock availability. As a result, the enhanced precision in delivery schedules has nurtured long-term collaborations with customers, contributing to an increase in export volumes and establishment of foreign subsidiaries.</p>
	<p>1-2. Enhancing digital capabilities in research and development enables small and medium-sized manufacturing firms to quickly and accurately respond to host country market demands, leading to increased customer satisfaction, more export orders, and a higher export ratio.</p>	<p>1-2-1. Small and medium-sized manufacturing firms enhance their digital capabilities in research and development by using Product Lifecycle Management (PLM) or digital manufacturing management system. This allows teams and supervisors to work without geographical constraints, overcoming the challenge of insufficient human resources during international expansion. Consequently, they can remotely monitor product development progress, creating products that cater to the host country's needs and, thereby, increasing the export ratio.</p>
		<p>1-2-2. Small and medium-sized manufacturing firms use AI technology to identify new product characteristics and respond rapidly to host country market demands in their research and development activities. This accelerates the R&D process and enhances the success rate of initial product samples, consequently increasing customer satisfaction and the export ratio.</p>

<p>P2-1. Comparing to supporting value activities, firms enhancing digital capabilities in the primary value activities (e.g., R&D and production) can strengthen inter-firm relationship enhancement, thus improving the depth and scope of internationalization.</p>	<p>2-1. Enhancing digital capabilities in research and development activities allows small and medium-sized manufacturing firms to convey exceptional capabilities and quality signals. This is beneficial for participating in overseas exhibitions, exploring unfamiliar markets, establishing trust and international reputation/credibility, reducing information asymmetry during internationalization, and increasing the export ratio and sales in other countries.</p>	<p>2-1-1. Small and medium-sized manufacturing firms enhance their digital capabilities in research and development by purchasing their own 3D printing machines (Additive Manufacturing). This is advantageous for overseas exhibitions and unfamiliar market development, effectively addressing industry issues that have arisen in the past. It helps convey exceptional capabilities and quality signals, establishing trust, reputation and credibility for new clients, and consequently increasing the export ratio and sales in other countries.</p>
		<p>2-1-2. Small and medium-sized manufacturing firms enhance their digital capabilities in research and development by adopting AI systems. This is advantageous for overseas exhibitions and unfamiliar market development. It helps overcome information asymmetry during internationalization, and consequently increasing the export ratio and sales in other countries.</p>
<p>P2-2. Firms with higher digital capabilities can strengthen inter-firm relationship enhancement, particularly team trust and organizational trust, thus improving the depth and scope of internationalization.</p>	<p>2-2. Small and medium-sized manufacturing enterprises that enhance digital capabilities in their production activities enable production line personnel and supervisors to hold immediate meetings without being constrained by location, remotely monitor product production quality and status, and increase on-time delivery rates, leading to an increase in the export ratio.</p>	<p>2-2-1. Small and medium-sized manufacturing enterprises that utilize Programmable Logic Controllers (PLC) in their production activities increase automation levels, resulting in reduced quality defect rates. Management personnel can work without location constraints and receive early alerts when production line anomalies occur. Engineers can address these issues remotely in real-time, enhancing on-time delivery rates and customer satisfaction, thereby increasing the export ratio.</p>
		<p>2-2-2. Small and medium-sized manufacturing enterprises, using Manufacturing Execution Systems (MES), ERP or AI in their production activities, enable various production machines in the factory to be checked or controlled remotely through computers and mobile devices. Production line personnel and supervisors can hold immediate meetings without being constrained by location. This overcomes the challenges of insufficient human resources during internationalization and allows remote monitoring of product production quality and status, resulting in increased on-time delivery rates and customer satisfaction, leading to an increase in the export ratio.</p>
	<p>2-3. Enhancing digital capabilities in production activities enables small and medium-sized manufacturing enterprises to directly integrate data with overseas major customers, increasing customer trust and consequently raising the export ratio.</p>	<p>2-3-1. Small and medium-sized manufacturing enterprises that enhance digital capabilities in their production activities use advanced production management systems to align with the requirements of overseas major customers. They exchange the latest delivery times and production-related information, establishing trust and reputation, thereby increasing the export ratio.</p>
	<p>2-4. Comparing to SME manufacturers focusing on niche markets, SME manufacturers in the production of bulk products, with enhanced digital marketing capabilities and the use of multiple digital tools, can reduce the searching costs for overseas customers, overcome information asymmetry, increase their export ratios and expand the export countries.</p>	<p>2-4-1. SME manufacturers in the production of bulk products use AR or VR during exhibitions to provide customers with a quick understanding of their factory and products. Additionally, they utilize multilingual official websites with features such as online inquiries and electronic catalogs. By leveraging multiple digital channels, they overcome information asymmetry, increase their export ratios and expand the number of export countries.</p>
		<p>2-4-2. SME manufacturers that cater to niche markets tend to use a more focused digital toolset for their marketing efforts, allowing potential overseas customers with specific needs to proactively discover their offerings.</p>
<p>2-5. Enhancing digital capabilities in sales and</p>	<p>2-5-1. SME manufacturers in the export-oriented</p>	

	<p>after-sales service capabilities, including new CRM systems, AI systems, and video technology, enable SME manufacturers to track all customer transaction records, predict customer needs, receive real-time feedback from overseas customers, and promptly resolve issues. This results in increased customer satisfaction and trust, consequently leading to higher export ratios and expansion of export countries.</p>	<p>manufacturing industry have enhanced their CRM capabilities by implementing new CRM systems or AI systems. These improvements include accumulating customer data, automating processes with tracking and visit reminders, predicting customer needs, and estimating the probability of successful transactions. This has led to increased customer satisfaction, a higher number of export orders and the increased number of export countries.</p> <p>2-5-2. SME manufacturers are leveraging video technology and VR systems to receive feedback from overseas customers without being restricted by time and location. This allows responsible engineers to quickly identify and resolve issues, ultimately increasing customer trust and export ratios.</p>
<p>P3. Comparing to primary value activities, firms enhancing digital capabilities in supporting value activities (e.g., human resources and infrastructure) can strengthen intra-firm management, thus improving the scope of internationalization.</p>	<p>3-1. SME manufacturers are strengthening their digital capabilities in administrative processes, making it easier to carry out internal monitoring and enhancing information flow, thereby increasing the number of export countries and facilitating the establishment of subsidiaries.</p> <p>3-2. The digital capabilities of SME manufacturers in human resource management facilitate the efficient identification of suitable candidates, the creation of a job competency replication system, and the removal of geographical limitations. This overcomes the challenge of insufficient human resources during internationalization, increases the export countries, and accelerates the establishment of subsidiaries in different countries.</p>	<p>3-1-1. SME manufacturers have data and experience in exporting and establishing subsidiaries. Through digital data storage, they can accurately transfer parameters, processes, and necessary documents from the factory to new export countries and new subsidiaries, overcoming traditional oral transmission methods, which facilitates the establishment of subsidiaries in new regions.</p> <p>3-1-2. SME manufacturers continuously update software systems, standardizing successful experience processes from previous firms, facilitating the exchange of information, and increasing the export countries and the establishment of subsidiaries.</p> <p>3-2-1. SME manufacturers utilize job portals and online interviews, free from geographical limitations, to search for suitable candidates, expediting the preparation of personnel for overseas subsidiary firms and facilitating the establishment of subsidiary firms.</p> <p>3-2-2. SME manufacturers use digital systems to document and replicate job competencies, reducing the frequency of supervisor visits through video conferencing, real-time data synchronization, and approval systems. This overcomes the challenge of insufficient human resources during internationalization, increases the export countries, and accelerates the establishment of subsidiaries in different regions.</p>

• **Discussion and conclusion**

This study addresses research gaps in existing literature by focusing on the digital capabilities of SMEs with limited resources. The research recognizes the importance of investigating tangible aspects of SMEs throughout their entire value chains and provides some insights for resource allocation in the context of digital capabilities. In accordance with Schneider and Kokshagina's (2021) and Eller et al.'s (2020) perspectives, we aim to provide an accurate characterization of SMEs, enabling a better understanding and evaluation of their digital capabilities within their respective organizational contexts. The research builds upon the foundational work of Oliveira et al. (2021) and emphasizes the crucial role of developing digital capabilities within the value chain. Through a thorough examination of how SMEs strategically navigate their complete value chains, we identify optimal resource allocation strategies for the efficient implementation of digital capabilities.

The interviews with the six firms revealed a critical insight that addresses gaps in existing research. The findings indicate that firms do not directly link their internationalization efforts to their

digital capabilities. This insight suggests that the current literature may not comprehensively capture the relationship between digital capabilities and internationalization, especially in the context of SMEs. The interviews revealed that the firms' strategies for internationalization are closely linked to factors such as value enhancement, relationship enhancement, and internal management practices. Additionally, this research considers that firms which concentrate on improving the digital capabilities in various value activities can impact different aspects of internationalization. This study contributes to a more comprehensive understanding of the role of digital capabilities in the internationalization efforts of smaller enterprises by addressing the specific requirements and challenges encountered by SMEs.



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MS0096: Evidence of Reshoring / Nearshoring: An Analysis of Imports to the United States of Selected Products

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**EVIDENCE OF RESHORING/NEARSHORING: AN ANALYSIS OF IMPORTS TO THE
UNITED STATES OF SELECTED PRODUCTS**

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Topic - Deglobalization

Abstract

This study will examine the phenomenon of reshoring/nearshoring implemented by the United States. The sample is composed of the following mature manufactured products that were initially offshored to export processing zones in low wage locations: knitted and non-knit textile articles, footwear, electrical machinery and medical, photographic, optical instruments. The data studied is restricted to U.S. imports of said products from two countries of the Far East and several countries from the Americas commencing in 2009 up to the present. The methodology is based on two statistical techniques: time series and trend analysis with calculation of the coefficient of determination for each trend equation.

Keywords: Deglobalization, Reshoring, Nearshoring

Introduction

United States President Donald Trump during his administration encouraged the return to North American territory of North American companies that had operations outside the USA, thereby ushering in a new age of economic nationalism. For many decades, many US firms engaged in an offshoring strategy, sending their manufacturing plants or segments thereof to Mexico, China, India, Vietnam and other countries with lower labor and related operating costs (Grunwald & Flamm, 1985). This followed Vernon's (1966) life cycle logic in the maturity stage whereby production costs are crucial for enterprise sustainability and competitiveness, especially in the face of imitation by other competitive firms.

Starting with the great recession of 2008 (Wallen & Wiberg, 2018), followed by protectionist policies implemented by former president Donald Trump (Freeman, 2019), and reinforced by successor president Joe Biden with executive order 14017, reshoring eventually became public policy in the United States. Reshoring and/or near-shoring constitute a relocation strategy that seeks the return of certain industrial sectors to US territory or near it (Bustamante, 2022) with the aim of achieving greater security and a recovery of the US manufacturing sector. These moves by the USA are often associated with the growing view by that country's leadership of China as a threat instead of a partner (Vertinsky, et. al., 2023). In this new context, "deglobalization" and "decoupling" have come to replace "globalization" and "liberalization", thereby contemplating nothing short of an astounding reversal of the globalization trend undertaken since the enactment of the General Agreement on Tariffs and Trade (GATT) at the end of World War II.

The main objective of this research is to try to determine whether reshoring or near-shoring is effectively taking place within the United States through the examination of that nation's imports from countries on or close to its borders that enjoy bilateral treaties that encourage production in (mostly) free trade zones. To be examined are US imports from four Central American countries (Honduras, Nicaragua, Guatemala and El Salvador) which form part of the Central America-Dominican Republic Free Trade Agreement (CAFTA-DR), as well as from the North American country of Mexico which forms part of the North American Free Trade Agreement (NAFTA). These will be counterposed by import data from the two principal producing countries in Asia (China and Vietnam) to determine whether the latter have experienced a drop in their total export values to the United States (based on US import data). In this contextual framework, it is considered that reshoring/near-shoring might play a predominant role going forward as firms take advantage of incentives to relocate in or near US territory thereby boosting exports from both Central America and Mexico.

Specifically the following five mature manufacturing products classified according to the Harmonized Tariff Schedule (HTS) will form the basis for this analysis: a) HTS 61: clothing and knitted and crochet accessories; b) HTS 62: Clothing and accessories not knitted or crocheted; c) HTS 64:

Footwear, leggings or similar items and their related parts; d) HTS 85: machinery and electrical equipment, televisions and recorders and e) HTS 90; Optical, photographic, medical, surgical products, parts and accessories. These product groupings were chosen because they have historically been the chief products exported to the US from free trade zones or “zonas francas” in the Caribbean and Central America (Tirado de Alonso, 1992). This research work is based on empirical data obtained from the US Department of Commerce to corroborate the research hypothesis.

Literature and Framework

Economist Raymond Vernon developed the theory of the international product life cycle in 1966, which uses economic and location factors to provide an explanation of the evolution and movement of new products between countries. This involves an analysis beyond production and takes into consideration the transfer of technology between developed and developing countries (Cao & Folan, 2011). From this theory, each product has a certain life cycle that begins with its development and ends with its decline into the maturity phase. As the maturity stage of a product approaches, a series of complex considerations such as transferring all or part of the production process abroad, increasingly concern producers located in high wage countries like the United States. At an advanced stage of standardization, low-wage developing countries can offer a competitive advantage as a production location.

It is possible to draw links between certain ownership-specific advantages of firms and the country-specific advantages likely to generate and sustain them (Dunning, 1988). In this respect, a country's factor endowments and institutional or market framework have been shown to have an effect on the ownership-specific advantages of its enterprises. An example of this is the scale of the firm, with countries with large and standardized markets spawning relatively large firms. Similarly, a country with a highly skilled labor force could possess an advantage in technology and skill intensive industries, while a country with relatively large quantities of cheap labor may generate labor intensive industries.

In the 1960s, the United States economy was arguably at its apex in most productive activities; however, the increase in domestic wages and regulations gave rise to the need for companies to contract suppliers in other parts of the world in order to remain competitive. Hence production and value chains became more dispersed throughout the world, eventually giving rise to a variety of global outsourcing and offshoring strategies (Contractor, et. al. 2011). Initially this took place in companies that manufactured final products derived from light industry (textile, footwear, plastic, etc.) (Grunwald & Flamm 1985, Sklair 1989, OAS 1995).

The twenty-first century eventually introduced a new element into the perspective of internationalization, with the resurgence of nationalism symbolized by the rise of Donald Trump to the presidency in the United States (Freeman, 2019). With this, the perspectives of offshoring and

outsourcing activities were spurned as important elements of the discourse on manufacturing in developed economies. Emerging news in recent years shows how manufacturing companies in the Organization for Economic Co-operation and Development countries (OECD) are increasingly bringing activities back home. Prominent cases such as Apple, General Electric, NCR, and Ford Company have given visibility to the topic in public discussions (De Backer et al., 2016). According to Tate (2014), companies' consideration of changing locational or “shoring” decisions were due to the 2008 economic recession, the emphasis being on sustainability and customer expectations regarding flexibility and improved economic performance.

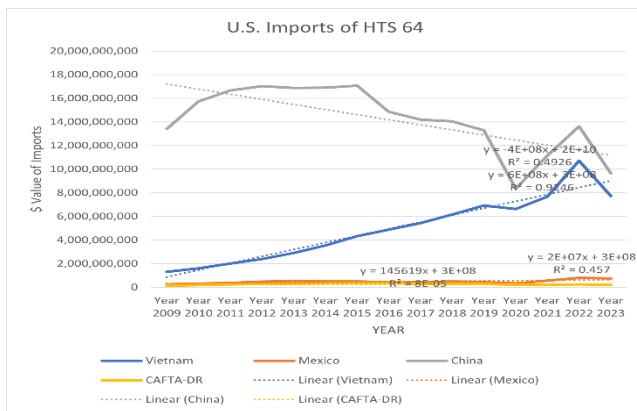
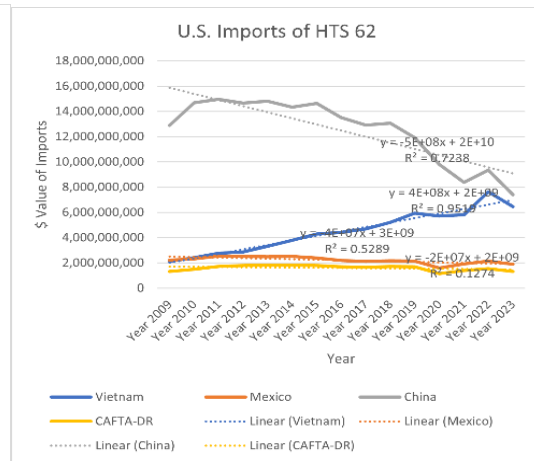
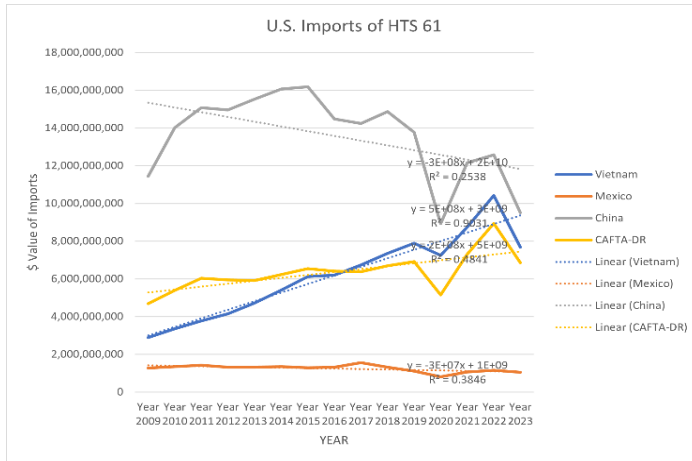
The reshoring phenomenon in the United States has received great attention since it became a political platform during the last elections (Tate, 2014). A survey in the US Fashion Industry Association's (USFIA) 11th annual Benchmarking Study indicated that a record 43 per cent of respondents sourced less than 10 per cent of their apparel products from China in 2023, compared to 18 per cent in 2018. Furthermore, nearly 60 per cent reportedly no longer use China as their top apparel supplier, a significant increase from pre-pandemic levels (Fibre Fashion, 2024).

Fratocchi et al. (2016) conducted a literature review regarding the motivations for reshoring, highlighting that the most common explanation for why companies tend to reshore is the rational reaction to changing conditions. Therefore, Transaction Cost Theory (TCC) and the Resource-Based View (RBV) can explain reshoring (Fratocchi et al., 2016). It is important to note that no enterprise is going to relocate a plant to the US to make low-value products, such as T-shirts. It's all focused on complicated high-value products, such as motor vehicles, chips, electrical and electronic products, heavy components and equipment, etc. Contrary to those industrial sectors, what concerns this current study is the nearshoring of such low-value products south of the US border.

Method and Results

The coefficient of determination (R^2) indicates the level of proportion of the variance of the dependent variable (Y =exports) depending on the variability of the independent variables (X =years). It is the level of reliability in which the values fit an estimated regression line (Castro-González, et al., 2017). According to the Graphs of HTS 61, HTS 62 and HTS 64 which covers clothing (knit and non-knit) and footwear exports to the United States from China, Vietnam, Mexico and the CAFTA-DR group of countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and the Dominican Republic) it is at first glance plausible that the reshoring phenomenon has affected China because as a negative trend of this countries exports can be observed more or less around the first half of the decade of the 2010's. However it should also be noted that Vietnam demonstrates a significant growth behavior with respect to its own exports to

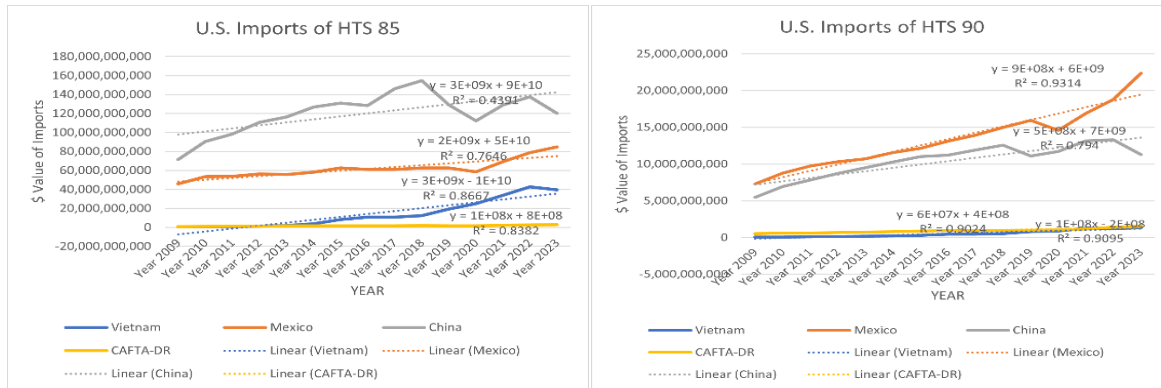
the United States in all three of these product groups. This suggests that any reshoring or nearshoring of clothing and footwear industries that may have occurred from the Far East did not affect Vietnam.



When Western hemisphere producers are examined, there is little evidence of either Mexico or the CAFTA-DR group benefitting from any nearshoring of clothing and footwear exports to the United States, with perhaps one exception. The CAFTA-DR group did experience an upward trend in the value of its knitted or crocheted (HTS 61) exports to the US, despite having a R2 of .48. It should be noted in all the graphs that the significant drop registered in export values of all products in 2020 is due largely to the COVID-19 pandemic.

According to the Graph of HTS 85, there is little evidence of the reshoring/nearshoring phenomenon affecting Chinese electrical machinery and equipment due to a growing trend of the value of these exports to the US since 2009, although its R2 is of the order of .44 reliability. Both Mexico and Vietnam exhibit similar upward trends as did China, and it should be noted that the value of Mexican exports exceeds that of Vietnam's for the entire time period. While the CAFTA-DR group experienced a similar positive trend, the total values of its exports are significantly below the values of the competitor

countries for the time period under study. Hence, the verdict on whether nearshoring or reshoring has taken place in this HTS 85 category, though seemingly unlikely, will have to await further analysis.



Finally, it is interesting to see that with regard to Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments (HTS 90) exports to the US, the leader of these three groupings is Mexico, while all others experienced positive trends. Hence conclusions about US nearshoring are ambiguous and would require further study.

Discussion

It is not possible with this analysis to draw solid “cause and effect” conclusions that any decline in a Far Eastern country’s, like China’s, exports to the United States of any of the products is a consequence of conscious reshoring or nearshoring towards the Western hemisphere. In the cases of clothing and footwear, and drawing inferences from the first three graphs of this study, the decline of exports from China was most likely compensated by the rise in exports to the US of said goods from neighboring Vietnam. As pertains to the textiles and clothing industry in particular, recent reports affirm the decline in Chinese imports, but point to an inability of CAFTA-DR exports to replace them (Fibre Fashion, 2024).

On the other hand, in order to determine if HTS-85 and HTS-90 are experiencing reshoring or nearshoring to the Americas, data from additional years going forward will be required to arrive at a more firm conclusion. For the time being, there exists only anecdotal evidence from the U.S. Office of Textiles and Apparel (OTEXA) that suggests US brands and retailers are gradually increasing their sourcing from suppliers based in the CAFTA-DR regions (JustStyle, 2024). Going beyond the context of mature manufactured products like clothing, footwear and consumer electronics, the theoretical framework of global value chains (GVCs) offers the most promising approach to studying the nature of reshoring and nearshoring (Gereffi, et. al., 2021).



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MS0098: Linking Leadership Skills to Career and Life Satisfaction: The Mediating Role of Promotability

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Linking Leadership Skills to Career and Life Satisfaction: The Mediating Role of Promotability

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Extended Abstract

Purpose: This study investigates leadership skills, and its impact on promotability, career satisfaction, and life satisfaction.

Aims: Despite the existing body of research on the antecedents of promotability (Seibert et al., 2017; Gentry et al., 2012; Sibunruang et al., 2014), there remain some gaps that merit further investigation.

Leadership skills include the ability to lead, self-confidence, the ability to influence, and communication skills (Segovia-Pérez et al., 2021). Leadership skills are crucial not only for interactions with subordinates but also for achieving personal career development (Mumford et al., 2000). Various

scholars have suggested that organizations can significantly enhance employees' self-efficacy and political skills through targeted leadership development programs (Seibert et al., 2017; Holmberg et al., 2014).

Building on cognitive consistency theory (Korman, 1970), we propose that employees with higher level of leadership skills are more likely to be promoted, which subsequently fosters greater career satisfaction and overall life satisfaction. This paper aims to explore how leadership skills impact life satisfaction and career satisfaction, with promotability serving as a mediating role.

Methods: This research employs a quantitative approach. Data was collected from over 300 participants.

We utilize Mplus software to conduct the statistical data.

Findings: Our findings provide support for the tested hypotheses. Leadership skills are positively associated with promotability. Moreover, leadership skills also have a significant impact on both career satisfaction and life satisfaction via promotability.

Conclusions: We empirically tested a framework that explains the impact of leadership skills on promotability, ultimately resulting in career and life satisfaction. Leadership skills are a key predictor of promotability. Leadership skills also have a positive indirect effect on career satisfaction and life satisfaction through promotability. Our research has several limitations, including the use of a cross-sectional research design and self-report method to assess the predictors and mediators, which could cause common method bias.

Keywords: Leadership skills, Promotability, Career Satisfaction, Life Satisfaction.

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MS0099: Escape, Stay, or Forced Move? The Impact of Firm Status on Firm Internationalization in Emerging Markets

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Escape, Stay, or Forced Move? The Impact of Firm Status on Firm

Internationalization in Emerging Markets

Abstract

Prior research on emerging markets firm's internationalization has predominantly identified antecedents from economic perspectives but has largely overlooked a social perspective. The current study contributes to this literature by proposing that a firm's social status significantly influences its level of internationalization, but the effect is not linear. We argue that low-status firms try to escape from their home emerging market, middle-status firms choose to stay, while high-status firms consider internationalization as a forced move. An analysis of 1,997 firms and 12,461 firm-year observations supports our hypotheses. We contribute significantly to literature of firm status and internationalization.

Key words: Firm internationalization, firm status, emerging market.

1. Introduction

A large body of literature has amassed on emerging markets firms' internationalization (EMFI) (for recent reviews, see Alon, Anderson, Munim, & Ho, 2018; Deng, 2013; Luo & Zhang, 2016). There are a variety of firm-level antecedents driving EMFI, including firm size, ownership, technological capabilities and managerial factors, as well as firms' strategic assets-seeking motives (Alon et al., 2018; Hernandez & Guillen, 2018). However, prior studies have overlooked how a firm's social standings, or social status in particular, affects its internationalization decision. Given that a firm's social status influences its behaviors and key outcomes (for a recent review, see Prato, Ertug, Castellucci, & Zou, 2024), investigating how firm status affects EMFI complements existing studies seems likely and it allows us to propose antecedents from a sociological perspective.

The current study bridges these two literature stream by proposing that firm status contributes

significantly to EMFI. Drawing upon an institutional account, we argue that firms with different status positions face different types of institutional pressure in emerging economies. We put forth three arguments. First, low-status firms less competent in bridging networks to overcome the institutional voids in the home country and thus desire to internationalize to escape from the emerging economies, consistent with institutional escapism (Luo & Wang, 2012; Luo & Zhang, 2016). Second, high-status firms face political pressure from the state and hence aligning their strategic decisions with government policies of, for instance, Going Global Policy in China (Schaefer, 2020). Third, middle-status firms, however, are less subject to resources constraints than low-status firms, but are not reputable enough to propagate national images overseas. Their intention to internationalize is therefore the lowest. Taken together, we propose a U-shaped relationship between firm status and its level of internationalization for emerging market firms.

We further argue that the main U-shaped relationship is steepened when a province in which a firm is located experiences key politician turnover, which generates significant political risks and policy uncertainty (Zhong et al., 2020). First, due to their limited access to resources, low-status firms may become even less susceptible to political risks, which further fuel their desire to depart from their home country. Second, high-status actors may face stronger institutional pressure from the state since new politicians, for the sake of their political performance, exert higher expectations of high-status firm to fulfill the political goals such as executing Going Global Policy in China. Third, as middle-status firms tend to be the most averse to risks (Phillips & Zuckerman, 2001), a heightened level of political risks induced by politician turnover makes them even more risk-averse and therefore further reduce the level of international investment.

2. Theory and Hypotheses

Status refers to the hierarchical position or rank a firm occupies within its industry or market (Jensen, Kim, & Kim, 2011). Research on firm status has proliferated in the past a few decades (for a recent review see Prato et al., 2024). Status is important in markets because resources and opportunities typically accrue disproportionately to the firms at the top of the status hierarchy (Podolny, 1993). For example, status has been found to affect firm strategic decisions and outcomes, such as alliance formation (Stern et al., 2014) or corporate acquisition (Shen et al., 2014)¹. In the International Business space, existing evidence bridging the two literature stream has largely adopted a macro-economic perspective on status transfer across nation-states. For instance, high-status venture capitalists in a home country can influence start-ups' status in another country (Alvarez-Garrido & Guler, 2018). Another example is that high-status foreign VC firms in a host country yield better performance there (Liu & Maula, 2021). But how status influences a firm's internationalization has not been fully explored.

A key consensus is that firms of different status positions might face different types of institutional pressure from stakeholders (Jensen, 2006; Phillips & Zuckerman, 2001; Prato et al., 2024). To illustrate, high-status firms are held accountable for their own behaviors and to meet stakeholders' expectations (Jensen, 2006) while middle-status firms tend to conform to the norms shaped by industry actors (Phillips & Zuckerman, 2001). In emerging economies, however, firms might face different kinds of institutional pressure. Emerging economies are characterized by lack of transparency and strong rule of law, rapid regulatory and policy changes, rampant government intervention and corruptions (Newman, 2000). This creates a heightened level of uncertainty and ambiguity for firms (Peng & Luo, 2000).

We argue that firms of different status positions face unique sets of institutional pressure in emerging markets. First, as low-status firms face significant resource constraints (Magee & Galinsky, 2008), they

¹ Note that although research on firm status originates from western context, its importance in affecting firm decisions in emerging economies has also attracted increasing scholarly attention (Liu, Dai, Liao & Wei, 2021; Xiao et al., 2023).

are less competent in bridging networks to overcome the institutional voids. For instance, as born global firms from emerging economies are constrained by lack of resources and incapable of coping with risks generated from institutional voids, they have strong motivation to invest overseas (Falahat, Knight, & Alon, 2018). Although there is no research touching upon low-status firms' response to institutional voids in emerging economies, it is nevertheless consistent with institutional escapism, which suggests that firms trying to overcome the institutional voids escape from their home country to seek for opportunities overseas (Luo & Wang, 2012; Luo & Zhang, 2016).

Second, we argue that as high-status firms have high visibility (Jensen, 2006) and state has strong control over critical resources in emerging economies (Peng & Luo, 2000), they need to undertake political tasks and align their strategic decisions with government policy directions, thus being forced to move (Schaefer, 2020). Research on status suggests that high-status firms hold greater accountability for meeting expectations of stakeholders (Jensen, 2006). In emerging economies, for instance, Huawei Technologies offshore its capital to conform to the Going Global Policy implemented by Chinese government (Schaefer, 2020).

Third, middle-status firms are less subject to resources constraints than low-status firms (Phillips & Zuckerman, 2001) so they have least need to escape from their home country. Furthermore, they shoulder much less responsibility of undertaking political tasks and promoting national images overseas. Thus, their intention to internationalize will be the minimal.

Hypothesis 1, There is a U-shaped relationship between firm status and firm internationalization.

We further propose that the main effect will get steepened when a province in which a firm is located experiences key politician turnover. Political leader transition in emerging economies results in heightened political risks as new leader will pursue his or her own political agenda to boost political

performance (Zhong et al., 2020). First, low-status firms will be even more likely to internationalize as they face heightened level of uncertainty in their home country. Second, high-status firms will invest more capital overseas as the return from new investment will be accumulated as part of the GDP, which constitutes the new leader's political credits. Third, as middle-status firms are the most risk-averse, we propose that they are more likely to adopt a wait-and-see approach and invest even less overseas.

Hypothesis 2, The main U-shaped relationship will be steepened when a province in which a firm is located experiences politician turnover.

3. Method and Results

We use a sample of Chinese firms listed on the Shanghai and Shenzhen stock exchanges to test our hypotheses. The China Stock Market and Accounting Research (CSMAR) database provides data on the firms listed on the Shanghai and Shenzhen stock exchanges. We ended up with 1,997 firms and 12,461 firm-year observations.

Measures. Firm status. We measure status by the amount of sell-side security analyst coverage, scaled by the focal analyst's industry expertise (Wang & Jensen, 2019). To obtain the industry expertise of security analysts, we first counted the number of firms that each analyst covers in each three-digit Standard Industrial Classification industry. The analyst with the largest number of firms in a given industry gets a score of one and the expertise of other analysts is calculated by dividing their covered number of firms in a given industry by the number of firms covered by the analyst covering the highest number of firms in that industry. As more than one analyst might cover a focal firm, its status is the aggregate of the industry expertise scores of the analysts that cover that firm.

Firm internationalization. We measured firm internationalization by scaling total foreign sales revenue by total sales. The results are also robust to total foreign sales scaled by total assets.

Politician Turnover. We measured politician turnover by using whether a province experiences turnover of provincial party secretary, the top No.1 leader of a province.

Control variables. We controlled for firm age, firm size, Tobin's Q, industry-average firm internationalization, CEO duality, total international experiences of a firm and number of foreign subsidiaries. We also included firm and year fixed-effect with robust standard errors.

Results. Model 2 of Table 1 shows a significant U-shaped impact of firm status on internationalization ($b=-0.005$, $p<0.01$; $b\text{-sq}=0.001$, $p<0.01$). The main effect is steepened when politician turnover occurs ($b=-0.022$, $p<0.1$; $b\text{-sq}=0.002$, $p<0.1$). Both hypotheses are supported

(Table 1 in the Appendix).

4. Discussion and Conclusion.

Our paper contributes to literature on emerging firms' internationalization by broadening our understanding of antecedents affecting internationalization from a sociological perspective. In addition, prior research on firms status has shown that middle-status actors tend to be conformative to institutional pressure (Phillips & Zuckerman, 2001; Prato et al., 2024). Our study contributes that before demonstrating conformative behaviors, actors must feel institutional pressure first. However, paradoxically, middle-status actors are the least subject to institutional pressure.

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Appendix

**Table 1 Fixed-Effect Model predicting Firm Internationalization
in a sample of Chinese private-owned Firms**

DV: Firm internationalization	Model 1	Model 2	Model 3
Firm age	0.018*	0.019*	0.019*
	(0.01)	(0.01)	(0.01)
Tobin's Q	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)
Firm size	0.011	0.01	0.01
	(0.01)	(0.01)	(0.01)
ROA	-0.104*	-0.108*	-0.108*
	(0.05)	(0.05)	(0.05)
Industry average internationalization	0.296***	0.295***	0.295***
	(0.04)	(0.05)	(0.05)
CEO duality	-0.005	-0.006	-0.006
	(0.01)	(0.01)	(0.01)
Total international experience	-0.002**	-0.002*	-0.002**
	(0.00)	(0.00)	(0.00)
No. of subsidiaries	0.003+	0.003+	0.003
	(0.00)	(0.00)	(0.00)
Politician turnover	0.001	0.001	0.019
	(0.01)	(0.01)	(0.01)
Firm status		-0.005**	-0.004**
		(0.00)	(0.00)
Firm status-sq		0.001***	0.001**
		(0.00)	(0.00)
Firm status * Politician turnover			-0.022+
			(0.01)
Firm status-sq * Politician turnover			0.002+
			(0.00)
Constant	-0.396+	-0.408+	-0.406
	(0.24)	(0.24)	(0.24)
Observations	12,461	12,461	12,461

* p<0.05, ** p<0.01, *** p<0.001



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MS0100: SMEs' Early Stage of Internationalization in the Age of Populism

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SMEs' Early Stage of Internationalization in the Age of Populism

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Extended Abstract

The global rise of populist agendas is evident worldwide. The existing body of literature has attempted to explore the business impact of such agendas, including the negative effects on foreign direct investment for large multinationals. However, it remains unclear how SMEs are affected by populist agendas, particularly during their early stages of internationalization (i.e., export). As such, this paper utilizes a sample of 18,659 SMEs in 27 emerging and developing economies. We find that SMEs' export intensity is adversely affected by populist agendas, and moreover, the negative impact is stronger for younger SMEs but weaker for those that started unregistered.

Keyword: Populism, Internationalization, Export, SME, Emerging and Developing Economies

Introduction

The rising level of populism in emerging and developing economies is becoming increasingly prominent, which is characterized by anti-globalization and anti-establishment. Leaders in these countries often harness nationalist sentiments and promise to prioritize the interests of the "common people" over elite or foreign influence. For instance, in Turkey, Recep Tayyip Erdoğan has consolidated power by positioning himself as a defender of the nation against perceived external

threats. In this paper, we aim to address the following research question: *How does populist agenda affect SME's early stage of internationalization in emerging and developing economies?*

Literature and framework

Populism has a profound impact on many aspects of business (Bennett et al., 2023; Devinney & Hartwell, 2020). The populist agenda is inevitably associated with anti-establishment and anti-globalization ideologies (Blake et al., 2020). Consequently, a rising level of populism in advanced democracies is detrimental to multinationals' foreign direct investment (Carballo Perez & Corina, 2024). In a similar vein, we argue that the populist agenda can also make SMEs more cautious about their internationalization activities, as populism is often coupled with anti-globalization, and they fear abrupt of changes in customs policies. As such, it can be hypothesized that:

Hypothesis 1: In emerging and developing economies, a rising level of populism can negatively impact SMEs' early stage of internationalization.

Drawing upon imprinting theory, we further posit that the impact of populism may differ for firms based on their historical status and current status. Specifically, some SMEs are often not officially registered when they began their business operations, particularly in the under-developed institutional contexts (Colovic et al., 2022), and these firms tend to be adept at navigating in a de-institutionalized environment. Their internationalization activities are therefore less affected by a populist agenda, which is characterized by de-institutionalization. In addition, considering the liability of newness, we argue that younger firms are more cautious in initiating export when confronted with a rising level of populism. Accordingly, we can hypothesize that:

Hypothesis 2: The negative impact of populism on the early stage of internationalization is weaker for SMEs started unregistered.

Hypothesis 3: The negative impact of populism on the early stage of internationalization is stronger for younger SMEs.

Methods and results

We utilize data from the Business Environment and Enterprise Performance Survey, where the fourth and fifth rounds primarily target private SMEs in emerging and developing economies in Eastern Europe and Central Asia. The latest round extends to the Middle East and North Africa. The survey, managed by the World Bank and the European Bank for Reconstruction and Development, employs a rigorous sampling method across different economies. Its credibility has been acknowledged by previous studies (e.g., Zeume, 2017). Additionally, we source data from the Global Populism Database and the World Bank. In total, we have obtained a sample of 18,659 SMEs, and Table 1 presents the distribution across 27 emerging and developing economies.

The dependent variable is direct export intensity, measured as the percentage of direct exports to total sales. The independent variable is the populism score, based on the president's or prime minister's speeches over a term. It ranges from 0 to 2, with higher values indicating higher levels of a populist agenda. The first moderator, started unregistered, is measured as a dummy variable equal to 1 if the SME was not formally registered when it began its operations, while the second moderator, firm age, is measured as the difference between the year of formal registration and the year of responding to the survey. We have also included a set of firm-level and country-level control variables, as shown in Table 2.

Given the hierarchical structure of our dataset, we employ multilevel regression to examine our hypotheses, with the results reported in Table 3. Model 1 includes only the control variables, Model 2 adds the independent variable, and Models 3 and 4 further add the moderating variables and their interaction terms. The coefficient of the populism score remains significant and negative across all models (Model 5: $coeff = -9.658$, $p = 0.000$), providing strong empirical support for Hypothesis 1. The coefficient of populism score \times started unregistered is marginally significant and positive (Model 5: $coeff = 2.351$, $p = 0.096$), which is consistent with Hypothesis 2. Additionally, the coefficient of populism score \times firm age is statistically significant and positive (Model 5: $coeff = 0.059$, $p = 0.025$). Thus, Hypothesis 3 is also supported. We have also conducted a difference-in-differences analysis as reported in Table 4.

Discussion

This paper addresses the impact of the populist agenda on international business activities for SMEs (i.e., direct export) in emerging and developing economies. By integrating with imprinting theory, we have also identified two critical boundary conditions upon arising from historical status (i.e., started unregistered) and current status (i.e., firm age). In sum, this paper has advanced our understanding of international business implications of the populist agenda, extending the focus from large multinationals to SMEs.

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Table 1. Sample distribution across economies

Country	Frequency	Percent	Country	Frequency	Percent
Albania	188	1.010	North Macedonia	269	1.440
Belarus	712	3.820	Armenia	252	1.350
Georgia	736	3.940	Kyrgyz Rep.	194	1.040
Tajikistan	247	1.320	Estonia	145	0.780
Turkey	2,172	11.640	Czech Rep.	531	2.850
Ukraine	1,626	8.710	Hungary	745	3.990
Uzbekistan	286	1.530	Latvia	447	2.400
Russia	3,869	20.740	Lithuania	454	2.430
Poland	1,118	5.990	Slovak Rep.	515	2.760
Romania	855	4.580	Slovenia	175	0.940
Serbia	272	1.460	Bulgaria	767	4.110
Kazakhstan	431	2.310	Croatia	603	3.230
Moldova	545	2.920	Montenegro	221	1.180
Azerbaijan	284	1.520	Total	18,659	100.000

Table 2. Summary statistics

Variable	M	SD	Variable	M	SD
1. Direct export intensity	5.420	17.617	10. Foreign technology usage	0.122	0.327
2. Populism score	0.496	0.387	11. Number of competitors	846.465	981.394
3. Firm age	15.488	10.647	12. Capital city	0.169	0.375
4. Started unregistered	0.964	0.188	13. GDP growth	3.609	2.336
5. Female top manager	0.204	0.403	14. GDP per capita	21,739.610	8,215.074
6. Top manager experience	18.159	10.420	15. Trade of GDP	93.194	38.599
7. Foreign ownership	4.251	18.812	16. Domestic investment	-4,828.729	7,715.977
8. State ownership	0.686	7.230	17. Political stability	-0.316	0.828
9. Firm size	2.973	1.095	18. Voice and accountability	-0.201	0.781

Note: N=18, 659

Table 3. Results of multilevel regression

Direct export intensity

Variable	(1)	(2)	(3)	(4)	(5)
Populism score		-6.275*** (1.469)	-8.816*** (2.002)	-7.476*** (1.541)	-9.658*** (2.034)
Started unregistered			-0.426 (1.100)		-0.338 (1.101)
Populism score × Started unregistered			2.626* (1.408)		2.351* (1.412)
Firm age				0.005 (0.019)	0.007 (0.019)
Populism score × Firm age				0.064** (0.026)	0.059** (0.026)
Control variables	Yes	Yes	Yes	Yes	Yes
Number of country groups	27	27	27	27	27
Number of industry groups	408	408	408	408	408
Wald Chi2	1937.23***	1945.88***	1953.40***	1960.66***	703.57***
Log likelihood	-77861.845	-77858.021	-77854.351	-77851.173	-73130.956

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 4. Results of difference-in-differences analysis

Variable	Direct export intensity		
	(1)	(2)	(3)
populism_rise	-1.722*** (0.522)		
populism_rise_02		-1.893*** (0.530)	
populism_rise_05			-3.041*** (0.982)
Control variables	Yes	Yes	Yes
R-squared	0.200	0.201	0.200

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.



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MS0101: Political Freedom and CSR

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Political Freedom and CSR

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Abstract

We view corporate social responsibility (CSR) as indicative of firms' enduring commitments and propose that greater political freedom enhances CSR performance. Political freedom correlates with reduced state expropriation, stable governmental regulations, and heightened social transparency, motivating firms to cultivate long-term competitive advantages through CSR initiatives. Our study of 30 countries lacking sustained high political freedom reveals a positive relationship between political freedom and CSR performance. Additional analyses indicate that the influence of political freedom operates primarily through fostering a long-term orientation among firms. This research enhances the understanding of CSR by highlighting that firms are more likely to engage in socially responsible behavior when they feel secure.

Keywords: Political freedom, CSR, Long-term orientation

1. Introduction

Despite the significant interest in understanding cross-country differences in firms' corporate social responsibility (CSR) performance, political freedom has been largely overlooked as a crucial factor in international business research. We hypothesize a positive causal relationship from political freedom to CSR, driven by the correlation between political freedom and firms' long-term commitments. While CSR practices involve initial implementation costs, they offer long-term benefits for survival and competitiveness. Firms are inclined to invest in CSR when they prioritize long-term strategies over short-term opportunism. Improved political freedom correlates with decreased state expropriation, stable governmental regulations, and heightened social transparency facilitated by press freedom. These factors motivate firms to increase CSR investments, seeking long-term competitive advantages.

Empirically, we have three major findings. First, we observe a significantly positive effect of political freedom on CSR in a sample of 8,040 firm-year observations from 30 countries with a lack of sustained high political freedom, which supports our hypothesis. Second, consistent with our hypothesis, the impact of political freedom on CSR diminishes when there is a reversal in political freedom following a change. Third, further analyses reveal that the influence of political freedom on CSR is more pronounced among firms that are typically less long-term oriented, suggesting that political freedom primarily affects CSR by encouraging a greater long-term commitment from these firms.

This research contributes to the international business literature by demonstrating that political freedom is a significant determinant of CSR. Additionally, it enhances the understanding of CSR by highlighting that firms are more likely to engage in socially responsible behavior when they feel secure, such as when political freedom is present.

2. Literature and hypothesis

There has been a dearth of literature on international CSR focusing on national institutions that do not vary through time such as legal origin and national culture. Ioannou and Serafeim (2012) did a thorough study on these country-level factors and found that political system is the most important factor in explaining corporate social performance heterogeneity, compared to education and labour system, financial system, and cultural system. Despite the increasing recognition of political institutions' role in CSR, the impact of political freedom, whose ratings are time varying, has received relatively little attention, and thus remains relatively under-addressed in CSR research.

Political freedom, an essential aspect of political institutions, encompasses the real-world rights and freedoms enjoyed by a country's people, including political rights such as political participation and civil liberties such as expression freedom, rule of law, and the right to organize. High political freedom is associated with a more friendly investment environment. For example, low political freedom is associated with increased investment risk (Boubakri, Mansi, & Saffar, 2013), higher costs of capital (Ben-Nasr, Boubakri, & Cosset, 2012; Qi, Roth & Wald, 2010), less liquid assets (Caprio, Faccio, & McConnell, 2013) and more cash payouts (Guedhami, Kwok & Shao, 2017).

We have three reasons to predict that more political freedom can lead to better CSR performance through enhancing firms' long-term commitments (the long-term orientation channel). Firstly, poor political freedom is associated with a higher level of government corruption and expropriation which dampens firms' CSR investment. In environments where corruption is prevalent and not effectively controlled by institutional mechanisms, firms prioritize cost control over social initiatives, so reduce investment in social and philanthropic activities. Secondly, higher political freedom is also associated with more predictable and stable government policies and regulations. A stable political environment, fostered by political freedom, often results in a robust regulatory framework that can enforce relevant laws and regulations, which reduces the uncertainty of investment outcomes. Thirdly, political freedom is associated with more press freedom and social transparency. Press freedom ensures a healthy, transparent, and accountable market environment for firms to plan and implement socially responsible strategies.

Hypothesis: Political freedom has a positive influence on CSR.

3. Empirical results

3.1. Data, sample and variables

We construct our sample by integrating relevant datasets. CSR performance (ES), our dependent variable, is evaluated by averaging environmental and social scores sourced from the widely recognized Thomson Reuters ASSET4 ESG database (ASSET4). Our primary independent variable, political freedom (PF), is derived from Freedom House's political freedom indexes. Additionally, we include various firm-level and country-level factors that may impact CSR. Detailed definitions and data sources for all variables are provided in Appendix 1.

Excluding financial industries and countries with sustained high political freedom (average PF ≥ 6.5) results in a sample of 8,040 firm-year observations from 30 countries from 2004 to 2021. Focusing on countries without sustained high political freedom can generate more implications for countries that has room for improvement in political freedom.

3.2. Model

To analyze the impact of political freedom on firms' social and environmental performance, we utilize the following regression model:

$$ES_{i,t} = \beta_0 + \beta_1 \times PF_{t-1} + \beta_2 \times PF_{t-2} + \sum_{c=1}^M \beta_c \times Country_c \times YEAR + \sum_{\lambda=1}^N \beta_\lambda \times control_{\lambda,i,t-1} + \alpha_i + t + \varepsilon_{i,t} \quad (1)$$

Here, $Country_c$ represents a country indicator, $YEAR$ denotes the time variable, and α_i and t correspond to firm and year fixed effects, respectively. Given the possibility that changes in political freedom status may manifest with a lag of two years in terms of their effect on ES, we include a country's political freedom ratings from the previous two years (PF_{t-1} and PF_{t-2}). The term

$\sum_{c=1}^M \beta_c \times Country_c \times YEAR$ encompasses a series of country-specific time trends, which helps alleviate concerns that the effect of PF on ES coincides with country-specific trends over the sample period unrelated to political freedom. Additionally, we assume that the residual term $\varepsilon_{i,t}$ clusters at the country level.

3.3. Results

In Table 2, we present the results derived from Equation (1). In Model (1), PF_{t-2} emerges as the country-level factor exerting the most significant impact on ES (the results on the controls are not reported for brevity), while PF_{t-1} does not have a significant coefficient. This indicates that an improvement in political freedom results in better CSR performance after a two-year period.

In Model (2), we address the potential concern about the distribution of our sample, even though it is not dominated by any single country. The country with the largest number of observations in our sample is China, accounting for 18% of the total. To ensure our results are not unduly influenced by the sample composition, in Model (2) we use the country-year averages of the variables to conduct the regression analysis. Even with this alternative approach, the coefficient on PF remains statistically significant, with a similar magnitude to Model (1).

We next investigate whether changes in PF lead to subsequent changes in ES two years later. In Model (3), we introduce an indicator variable, "Reversal," which equals 1 if either year t-1 or year t experiences a change in PF opposite to that of year t-2 (i.e., $\Delta PF_{t-2} \times \Delta PF_{t-1} < 0$ or $\Delta PF_{t-2} \times \Delta PF_t < 0$). The rationale is that if changes in PF do indeed influence ES two years later, this effect should not occur if an opposite change in PF occurs in year t-1 or year t. In Model (3), our findings are supportive. The coefficient of $Reversal \times PF_{t-2}$ is significantly negative, and its magnitude offsets that of the coefficient of PF_{t-2} , suggesting that PF_{t-2} does not influence ES when an opposite change in PF occurs between year t-2 and year t.

Lastly, we conduct two analyses to examine whether the effect of PF on ES is through the long-term orientation channel, namely, more political freedom leading to firms planning for long-term survival and competitive advantages. Firstly, if enhancing PF was to boost ES by fostering firms' long-term orientation, this effect might be less pronounced for companies already committed to long-term plans. For instance, large and profitable firms tend to prioritize long-term goals due to their stable financial position

and ample resources. With established market presence, robust cash flows, and access to capital, these firms can afford to focus on strategic objectives over short-term gains. Our hypothesis posits that the impact of PF on ES should be attenuated among such firms. In Model, we introduce an indicator variable, BP, which takes a value of 1 when a firm's size and profitability exceed their respective sample medians simultaneously, and interact it with PF_{t-2} . Our findings reveal a significantly negative coefficient on the interaction term, indicating that the influence of PF on ES is diminished among large and profitable firms, thus providing support for the long-term orientation pathway.

Table 1						
This table reports the results from regressing ES on the values of PF in the previous two years and control variables. All the control variables are lagged values and defined in Appendix. Standard errors in the parentheses are calculated based on the assumption that the residuals cluster at the country level. ***, **, and * show the significance levels of 1%, 5% and 10% respectively.						
	(1)	(2)	(3)	(4)	(5)	(6)
		Country-level	ES	ES	SOE	Non-SOE
PF_{t-2}	0.032*** (0.01)	0.034* (0.02)	0.037*** (0.01)	0.034*** (0.01)	0.010 (0.01)	0.037*** (0.01)
Reversal			0.106** (0.05)			
Reversal \times PF_{t-2}			-0.044** (0.02)			
BP				0.033*** (0.01)		
BP \times PF_{t-2}				-0.004** (0.00)		
ECO						
PF_{t-1}	0.004 (0.01)	0.021 (0.03)	0.000 (0.01)	0.003 (0.01)	0.007 (0.02)	-0.005 (0.01)
controls in Appendix	Yes	Yes	Yes	Yes	Yes	Yes
Year & firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific time trends	Yes	Yes	Yes	Yes	Yes	Yes
N of obs.	8040	335	8,040	8,040	1,431	6,609
Adj. R ²	0.824	0.881	0.824	0.824	0.813	0.821

Secondly, similar to the analysis above, state-owned enterprises (SOEs) in countries with low political freedom tend to face less concern regarding political risk compared to their private counterparts due to their

close alignment with the government. These entities often enjoy preferential treatment, receiving substantial support and protection from the state, thereby mitigating the impact of political instability or arbitrary regulatory changes. Given their direct ties to the ruling regime, SOEs are less susceptible to adverse government actions that could threaten their operations or profitability. Furthermore, their monopolistic or dominant market positions can serve as a shield against competition and external pressures. Consequently, while private enterprises navigate a labyrinth of political uncertainties, SOEs in such environments often operate with a sense of security, leveraging their symbiotic relationship with the government to weather turbulent political climates. Therefore, we predict that the effect of PF on ES is more pronounced among private firms. This prediction is supported by evidence in Models (5) and (6), where the coefficient on PF is significant only in the subsample of non-SOE firms (Model 6).

4. Conclusion

We contribute to the literature on political risk by demonstrating that improvements in political freedom lead to better CSR performance. More importantly, our findings suggest that the effect of political freedom on CSR operates by enhancing firms' long-term commitments. Companies need to have a sense of security and a long-term focus before they can effectively engage in socially responsible practices. This perspective differs from the common belief that regulations are the primary tool for improving CSR performance.

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Appendix

Variables	Definition	Source
ES	The average of a company's ratings on environmental and social performance.	ASSET4
PF	The political freedom scores including indicators of both political rights and civil liberties.	Freedom House
EF	Economic freedom scores.	Fraser Institute
STABILITY	Political stability scores.	World Bank
GOVCON	The ratio of a country's government consumption to GDP.	World Bank
IFDI	The ratio of inward foreign direct investment to GDP.	World Bank
MKTCAP	The ratio of a country's stock market capitalization to GDP.	World Bank
GDPG	The GDP growth rate.	World Bank
GDP	The logarithm of a country's GDP per capita (2017 US\$).	World Bank
CGV	A company's rating on governance performance.	ASSET4
SIZE	The logarithm of total assets in US dollars.	Compustat
DEBT	The ratio of total liabilities to total assets.	Compustat
ROA	The ratio of pretax income to total assets.	Compustat
CAPX	The ratio of capital expenditure to total assets.	Compustat
RND	The ratio of research and development expenses to total assets.	Compustat
INTAN	The ratio of intangible assets to total assets.	Compustat
SG	The sales growth rate.	Compustat
CASH	The ratio of cash and short-term investments to total assets.	Compustat



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MS0102: Servant Leadership and Job Engagement: The Role of Agency Thinking

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Servant Leadership and Work Engagement in Hospitality Industry:

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Extended Abstract

Purpose: This study explores the role of Agency thinking in the relations between servant leadership and Work Engagement.

Aims: Previous research has demonstrated that leadership style has a significant impact on employees' work engagement (WE). Hope is linked to work performance and many other employees work attitude including organizational commitment, job satisfaction, and happiness at work. As an important construct that helps employees to thrive, we expect hope to be a significant variable that mediate the relationship between leadership style and work engagement. By applying the Servant Leadership Theory in this study, we propose that servant leadership (SL) style and agency thinking

(component of hope) is positively linked to employees' work engagement. We also explore how link between SL-WE might be mediated by Agency Thinking (AT).

Methods: Data for this study was collected using a cross-sectional questionnaire survey. Items in the questionnaire were adapted from established scales. The IBM-SPSS Amos software was used to do statistical analysis.

Findings: The results showed that servant leadership and agency thinking are positively associated with work engagement. As hypothesized, Agency thinking is a (partial) mediator between servant leadership and work engagement.

Conclusions: This study provides insight into the mechanism of the effect of servant leadership on employee attitudinal consequences, introducing the role of agency thinking. The findings imply the importance of hiring leaders with servant leader characteristics. This form of leadership is critical in the service industry as the leadership not only acts as stewards but also inspires employees to be more engaged in their work.

Keywords: Agency thinking, Servant leadership, Work engagement

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MS0103: Finding Strength in History: Effects of Historical Nostalgia Consumption on Self-Transcendence

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Finding Strength in History: Effect of Historical Nostalgia Consumption on Self-Transcendence

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ABSTRACT: This research contributes to the understanding of how consumption behaviors influence consumers' psychological well-being from an innovative perspective—historical nostalgia consumption, that is, consumers' consumption of products or activities that elicit historical nostalgia. Across one panel data analysis of television viewing behavior and two experimental studies, we revealed that people consumed significantly greater amount of historical nostalgia television programs after (vs. before) the onset of the coronavirus pandemic (Study 1), because historical nostalgia, either as a chronic trait (Study 2) or situationally induced (Study 3), elevates people's self-transcendence which provides people with psychological strength and resources to navigate difficult times, such as the coronavirus pandemic. Moreover, we demonstrated that the positive effect of historical nostalgia on self-transcendence is driven by orienting people's focus outward to others. These findings contribute to existing research on the benefits of consumption behaviors on consumers' psychological well-being by demonstrating that historical nostalgia consumption enhances self-transcendence. This research also deepens extant rather limited understanding of historical nostalgia, and adds to self-transcendence literature by identifying historical nostalgia as an antecedent. From a practical standpoint, marketers can leverage historical nostalgia by incorporating historical elements into their offerings and marketing activities to strengthening connection with consumers navigating an era of challenges and adversities.

KEYWORDS: Historical Nostalgia, Self-Transcendence, Other-Focus, Consumption, Psychological Well-being

HONOR CODE STATEMENT: The submission has not been sent in to multiple tracks, and has not been published or accepted for publication in any journal.

EXTENDED ABSTRACT

Introduction

In recent years, the world is marked by heightened uncertainty and widespread hardship, which is further exacerbated by the COVID-19 pandemic. Individuals are constantly confronted with challenges that test their resilience and adaptability. Nowadays with everybody acting as a consumer, people's consumption behaviors inevitably influence various aspects of their lives and well-beings. Can certain consumption help people navigate challenging times? This research addresses this question from an innovative perspective – historical nostalgia consumption. We propose that consumptions that induce historical nostalgia benefit people at difficult times by elevating self-transcendence, and this is driven by shifting people's focus towards others rather than on themselves.

Theoretical Development

Historical Nostalgia and Coping with Adversities

Historical nostalgia, as a unique form of nostalgia, refers to the sentimental longing for historical pasts that one has not lived through (Stern 1992). Nostalgia is a commonly used strategy to cope with adversities and hardships. Prior research dominantly focused on personal nostalgia, documenting people seeking comfort in their autobiographical past (Xia, Wang, and Santana 2021). Yet, the role of historical nostalgia is neglected. Various consumption activities, ranging from purchasing vintage products and consuming historical media contents to visiting heritage destinations, can elicit historical nostalgia. We propose that historical nostalgia consumption benefits psychological well-being.

The key lies in the cognitive process of historical nostalgia. Unlike the self-relevant nature of personal nostalgia (Baldwin, Biernat, and Landau 2015), historical nostalgia is not necessarily about the self. People rely on secondary sources of information such as history records, collective memories, and intergenerational learning to recreate the historical past (Merchant and Rose 2013). In other words, individuals have more freedom to imagine and fantasize past events and associations (Marchegiani and Phau 2013). In the dynamic process of imagining historical past, people simulate mental images of hypothetical past world events (Holly 2018). These imagined events and scenarios

revolve around how society and people's life were in the distant past. This process activates unique neural regions compared to that of imagining a self-relevant past (Abrahama, Schubotz, and von Cramon 2008). As such, we speculate that historical nostalgia orientates people's focus away from themselves and towards others.

Self-Transcendence and Other-Focus Orientation

Self-transcendence is an inherent quality in human. It refers to "the capacity to look beyond oneself and adopt a larger perspective that includes concern for others" (American Psychological Association 2020). The capability of other focus underpins people's self-transcendence. Indeed, self-transcendent individuals emphasize the interconnectedness of life (Wong et al. 2021) and score lower on individualism (Le and Levenson 2004). It seems likely that the other-focus orientation induced by historical nostalgia may elevate self-transcendence.

Self-transcendence provides psychological resources for people overcoming hardships (Reed 2008; Wong et al. 2021). It positively influences subjective well-being and negatively affects depression among diverse populations (Coward 1996; Liu et al. 2021). Facing adversities, people with high level of self-transcendence adopt broadening perspectives about life and view bad situations in some larger meaningful context. This enhances their capacity to endure and transcend hardships (Garcia-Romeu et al. 2015; Wong et al. 2021).

All in all, we propose that historical nostalgia consumption elevates people's self-transcendence through the mechanism of orienting their focus on others versus self. We tested these propositions in one panel data analysis of television program viewing behavior and two experimental studies.

Study 1: People consume more historical nostalgia after pandemic outbreak

Study 1 examined people's consumption of historical nostalgia TV programs before and after the onset of the COVID19 pandemic. As hypothesized, historical nostalgia consumption elevates self-transcendence, which facilitates people's coping with hardships. Hence, we expected people to consume more historical nostalgia television programs after (vs. before) the onset of the pandemic,

compared to control programs. Note that the comparison between historical and personal nostalgia consumptions is outside the scope of this research.

Data

Our dataset covers 1,798 individual Hong Kong consumers' (aged 20-70) minute-to-minute viewing history of TVB HD Jade (the most popular channel in Hong Kong) from June 1, 2019 to May 31, 2020. Among the 119 dramas, 156 movies, and 23 documentaries programs in the dataset, we identified historical nostalgia programs as those depicting content occurring before audiences' birth (i.e., prior to the year of 1949), and compared it against non-nostalgia control programs. Personal nostalgia programs depicting content occurring in audiences' personal past were also included in the analysis for the sake of results interpretation.

T-test Analysis

To obtain model free evidence, we performed *t*-test on the average number of audiences per broadcasting minute for historical nostalgia, personal nostalgia, and non-nostalgia control programs, comparing the means before with those after the onset of the pandemic, respectively. Of interest, results showed that the average number of viewers for historical nostalgia programs significantly increased from 58.64 to 158.47 ($t = 8.35, p < 0.01$), while the average number of viewers for non-nostalgia programs decreased from 243.80 to 202.1 ($t = -3.70, p > .10$; see Table 1), indicating increased consumption of historical nostalgia (vs. control) TV programs after the pandemic outbreak.

--- insert Table 1 about here---

Model and Result

To provide robust evidence, a difference-in-difference (DID) model was employed, comparing viewers' consumption of historical nostalgia (vs. control vs. personal nostalgia) programs before versus after the outbreak of the pandemic. We developed the model at program episode level because most programs contain several episodes that span across the pandemic, with some episodes airing before and others after its onset. Each program's total number of audiences represent its consumption level. Due to page limit, we presented the detailed model and analysis findings in the Appendix. In

short, consistent with *t*-test result, the DID model estimation results provided convincing evidence that the pandemic significantly increased people's consumption of historical nostalgia TV programs compared to before, whereas no such trend was observed for non-nostalgia control TV programs. This study demonstrated that time of distress enhanced people's historical nostalgia consumption, suggesting its potential psychological benefits.

Study 2: Trait historical nostalgia

This study tested our hypotheses by examining the relationship between people's trait historical nostalgia proneness and self-transcendence level, with other-focus tendency as the mediator.

Method

198 participants (65.2% female, $M_{\text{age}} = 38.07$) from Prolific participated this study. Trait historical nostalgia proneness was measured with 5 items that assessed their general tendency to nostalgise about historical past (e.g., "think about a time before I was born"; adapted from Baldwin et al. 2018). Participants also indicated whether they undertook 11 historical nostalgia activities (e.g., visiting museums, and reading classic books) in the past year, and evaluated the value of these activities (adapted from Xia et al. 2021). Next, participants reported self-focus (think about "yourself") and other-focus ("others", "someone else", "a public figure", "family", "friends"; Chang and Hung 2018) tendency. Self-transcendence was measured using Reed's Self-Transcendence Scale (Reed 1991). Participants' time perception of time ("limited" and "plentiful"; Rudd, Vohs, and Aaker 2012), and holistic thinking (3 items; Pan and Jiang 2022) were measured as alternative accounts.

Results

A regression analysis showed that participants' trait historical nostalgia ($\alpha = .89$) positively predicted their engagement in historical nostalgia activities ($\beta = 1.25, t = 5.56, p < .001$), supporting the validity of this measure. Regressing participants' self-transcendence ($\alpha = .87$) on trait historical nostalgia revealed a positive predicting role of historical nostalgia tendency ($\beta = .72, t = 1.93, p = .056$). Mediation analysis (PROCESS Model 4, Hayes 2013, with 5,000 bootstrapping samples) with trait historical nostalgia as the independent variable, other-focus as mediator, and STS as the

dependent variable indicated a significant mediation via other-focus ($B = .325$, $SE = .153$, $CI_{95} : .084, .668$), with the direct effect dropping to insignificant level ($p = .32$). Treating time perception ($r = .61$, $p < .001$) and holistic thinking ($\alpha = .87$) as mediators in the PROCESS model revealed no significant mediations (time perception: $B = -.087$, $SE = .073$, $CI_{95} : -.248, .030$; and holistic thinking: $B = -.012$, $SE = .079$, $CI_{95} : -.182, .150$), ruling them out as alternative explanations.

Study 3: Manipulating historical nostalgia

This study manipulated historical nostalgia to further examine its causal effect on self-transcendence and the mediation via other-focus orientation. Alternative explanations were examined.

Method

203 participants (86 males; $M_{age} = 37.87$, $SD = 12.77$) participated in this single-factor (historical nostalgia vs. control) between-subjects study. Participants reflected on and wrote about either “a time in history before you were born” (historical nostalgia condition) or “what you did yesterday” (control condition; adapted from Baldwin, White, and Sullivan 2018). Nostalgic feeling (manipulation check) and general affect (alternative explanation) were measured (all measures rated on 7-point scales unless otherwise specified). Next, they evaluated self-focus (think about “yourself”) and other-focus (“others”, “important issues”, and “something greater than myself”). Then they completed the Self-Transcendence Scale (1 = not at all, 4 = very much; Reed 1991), and two behavioral measures of prosocial behaviors (donating time to help a prosocial cause and donating money to a charity; Haugan et al. 2011). Finally, they completed measures of holistic thinking (Analysis-Holism Scale; Choi et al. 2007) and perception of stability (Han and Newman 2021).

Results

Manipulation check. As intended, participants in the historical nostalgia condition reported significantly stronger nostalgic feelings than those in the control condition ($M_{history} = 4.19$, $SD = 1.79$ vs. $M_{control} = 3.20$, $SD = 1.81$; $F(1, 201) = 15.34$, $p < .001$, $\eta_p^2 = .07$).

Self-Transcendence and prosocial behavior. An ANOVA revealed that participants in the historical nostalgia condition exhibited greater self-transcendence ($\alpha = .90$) than those in the control

condition ($M_{\text{history}} = 3.02$, $SD = .52$ vs. $M_{\text{control}} = 2.86$, $SD = .55$; $F(1, 201) = 4.25$, $p < .001$, $\eta_p^2 = .07$). Participants in the historical nostalgia (vs. control) condition reported to donate significantly greater time ($M_{\text{history}} = 2.90$, $SD = 1.75$ vs. $M_{\text{control}} = 2.20$, $SD = 1.76$; $F(1, 201) = 7.82$, $p < .001$). The difference of money donation across conditions was of similar pattern but not significant ($M_{\text{history}} = 9.90$, $SD = 8.96$ vs. $M_{\text{control}} = 8.35$, $SD = 8.25$; $p = .20$).

Self-focus vs. other-focus. Self-focus was not significantly different across conditions ($F(1, 201) = .001$, $p = .97$). ANOVA on other-focus ($\alpha = .76$) revealed that participants in the historical nostalgia condition were more other-focused than those in the control condition ($M_{\text{history}} = 4.85$, $SD = 1.24$ vs. $M_{\text{control}} = 3.97$, $SD = 1.50$; $F(1, 201) = 20.10$, $p < .001$, $\eta_p^2 = .09$).

Mediation. Mediation analysis (PROCESS Model 4, Hayes 2013, with 5,000 bootstrapping samples) was performed with condition as the independent variable, self-focus and other-focus as two parallel mediators, and STS as the dependent variable. The results indicated a significant mediation via other-focus ($B = .126$, $SE = .038$, $CI_{95\%}: .059, .209$); conversely, self-focus did not mediate the main effect ($B = .00$, $SE = .013$, $CI_{95\%}: -.025, .028$).

Alternative explanations. Separate mediation analyses (PROCESS Model 4, Hayes 2013) with each alternative explanation (affect, holistic thinking, stability) as the mediator respectively revealed no significant mediation (affect: $B = -.030$, $SE = .033$, $CI_{95\%}: -.096, .036$; global thinking: $B = .007$, $SE = .024$, $CI_{95\%}: -.041, .057$; stability: $B = .033$, $SE = .042$, $CI_{95\%}: -.049, .117$), ruling these out as possible alternative accounts.

Discussion

The current research identifies an adaptive strategy of coping with hardships—historical nostalgia consumption. We contribute to theoretical understanding of historical nostalgia and self-transcendence by uncovering the beneficial effects of historical nostalgia consumption on self-transcendence as well as the underlying mechanism via other-focus orientation. Practically, marketer can leverage historical nostalgia to help and connect with consumers at times of uncertainty and challenges.

TABLE 1

T-test results of program viewership before vs. after the onset of pandemic

Program Rating	Mean		Std. Err		t-value	p-value (H0: before = after)
	Before	After	Before	After		
Nostalgia (in total)	104.21	231.46	2.85	15.96	9.13	<0.001
Historical Nostalgia	58.64	158.47	2.36	13.72	8.35	<0.001
Personal Nostalgia	45.58	72.98	1.02	3.69	8.19	<0.001
Non-nostalgia	243.80	202.13	8.56	5.88	-3.70	>.10

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APPENDIX

Study 1 Model Specification and Results

Model

The DID model is as follows:

$$Viewing_{it} = constant + \alpha \times DuringPandemic_{it} + \beta \times HIS_Nostalgia_i \times DuringPandemic_{it} + \gamma \times PER_Nostalgia_i \times DuringPandemic_{it} + \mathbf{X}'_{it} \times \boldsymbol{\eta} + \tau_i + D_{it} + \varepsilon_{it}$$

The dependent variable $Viewing_{it}$ is the number of audiences, averaging over all broadcasting minutes in episode t of program i . Variable $DuringPandemic_{it}$ indicates that the episode t of program i is broadcast during the pandemic of COVID-19, i.e., after December 31, 2019. It equals one if the program is broadcasted after the pandemic outbreak and zero if it is broadcast before the pandemic. α is the parameter corresponding to $DuringPandemic_{it}$. Programs which are nostalgic (either historical or personal) are our treatment group and other non-nostalgia programs are control group. The dummy variable $HIS_Nostalgia_i$ takes value one if program i is identified as a historical nostalgia program, and the dummy variable $PER_Nostalgia_i$ equals one if the program is personal nostalgia type. The coefficients β and γ for the interaction terms $HIS_Nostalgia_i \times DuringPandemic_{it}$ and $PER_Nostalgia_i \times DuringPandemic_{it}$, respectively, represent DID estimators that capture how the number of audiences of historical and personal nostalgia programs in the treated group change after the onset of the pandemic, in comparison to non-nostalgia programs in the control group during the same period.

The vector \mathbf{X}'_{it} is a collection of program-episode specific control variables. Prior literature show that consumers' TV viewing decisions are affected by lead in (measured as the rating of the program immediately prior to the current program episode, e.g., Danaher and Mawhinney 2001; Jardine et al. 2016), genre match (i.e., dummy, whether the genre of the current program episode is the same as that of preceding program, e.g., Danaher and Dagger 2012; Jardine et al. 2016), and broadcasting time such as daypart or prime time or not (e.g., Wilbur et al. 2013; Wolf & Donato 2019), day of the week, and season (e.g., Wilbur et al. 2013; Deng and Mela 2018). Therefore, we include these variables in \mathbf{X}'_{it} and the column vector $\boldsymbol{\eta}$ represents the corresponding coefficients. In addition, we include a program fixed effect τ_i to capture the unobserved impact which are identical for the same program but differs across episodes. Such impact may come from the TV program's country of origin (Danaher et al., 2011), program genre (e.g., Deng and Mela 2018), program length (e.g., Danaher and Mawhinney 2001; Yoo and Kim 2002), whether the program is rerun (e.g., Danaher et al. 2011; Danaher and Dagger 2012), and etc.

Since the number of audiences of the later episodes of a series program is usually higher than the earlier episodes due to consumers' continuous involvement in the program (Song et al. 2021), we also include a dummy variable D_{it} to capture this time trend. For each program i , D_{it} is set to zero for its first two-thirds of episodes and to one for the last one-third of episodes. The random error term ε_{it} is

i.i.d. across episode t of program i .

Results

Parallel Test. The results of DID analysis would be valid only when the treatment group and control group satisfy the parallel trend assumption before the treatment occurs. Since different programs have different number of episodes and one program only appear part of the entire sample period, i.e., different programs t -th episodes are not corresponding to the same calendar day, conducting the parallel test is not straightforward as what can be done in balanced sample. Following Li et al. (2021), a recent paper with unbalanced data, we conduct the following analyses to examine the parallel trend assumption with the matched sample data in our context.

First, we present a graphical representation of pre-treatment trends over time by calculating weekly rating for both non-nostalgia and nostalgia programs in the total and matched sample, respectively, as depicted in Figure A1 and A2. The first week starts on December 31 2019, which aligns with the first pandemic announcement by Wuhan Municipal Health Commission. In Figure A1, the first intersection is approximately located in the first week, at that time, the rating of the nostalgia program overtook the non-nostalgia program, and the second intersection is approximately located in the 10th week (from 2019.3.3 to 2019.3.9). The two graphical representations exhibit a pattern consistent with the requirements of the parallel trend assumption for DID analysis.

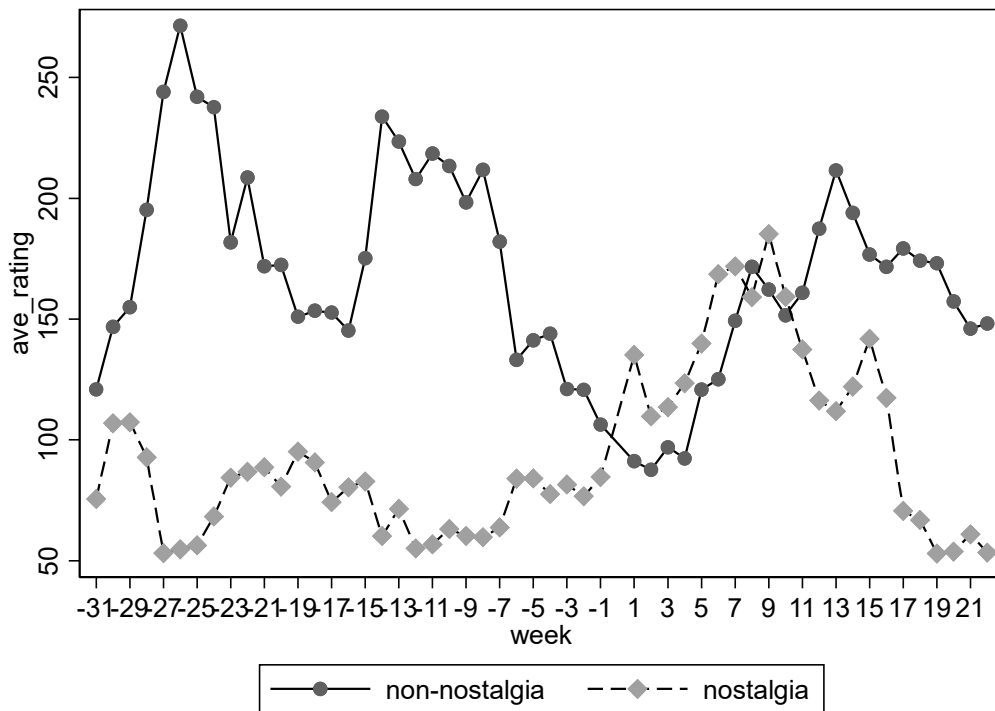


Figure A1. Non-matched rating trend between nostalgia and non-nostalgia group over time

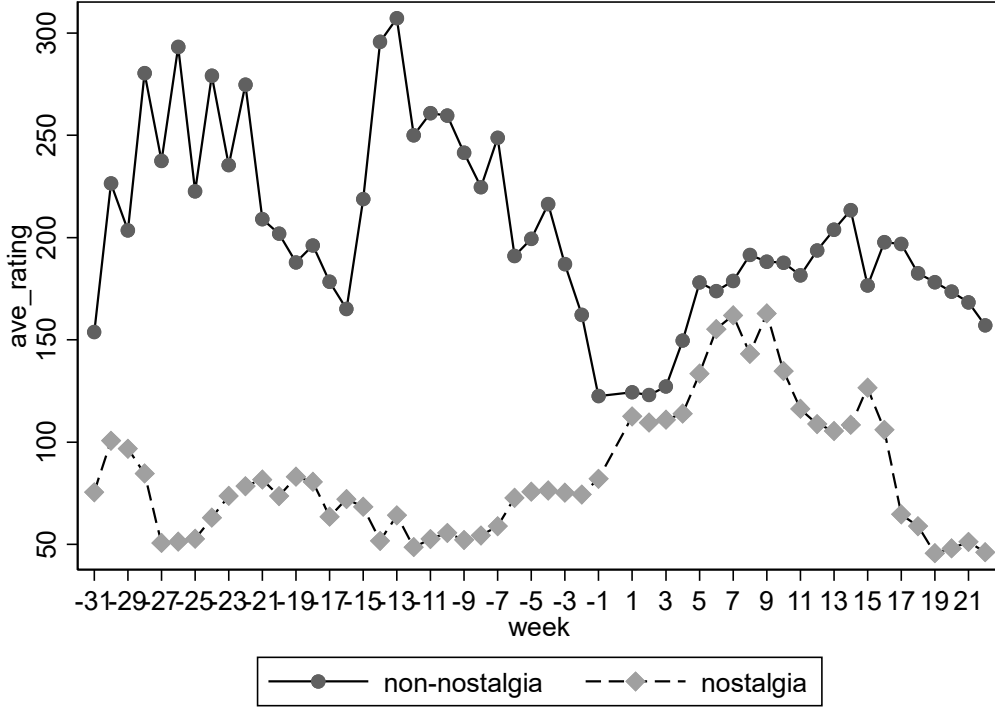


Figure A2. CEM rating trend between nostalgia and non-nostalgia group over time

Parallel Test - - Pre-treatment Regression. Second, we conduct the following regression analysis with the data in pre-treatment period (before December 31 2019):

$$Viewing_{it} = \tau_i + \mu \times t + \varphi \times Nostalgic_i \times t + \varepsilon_{it} \quad (2)$$

As in equation (1), $Viewing_{it}$ is the number of audiences, averaging over all broadcasting minutes in episode t of program i . The explanatory variables include program fixed effect τ_i , a linear trend variable for episodes t , and interactions between nostalgia nature dummy of programs with the episode trend. μ and φ are the corresponding coefficients of the episode trend and the interaction term. As reported in Table A1, the coefficient of the interaction term is insignificant ($-0.001, p = 0.356$), indicating nostalgia and non-nostalgia programs have a parallel trend before the Covid-19.

Table A1. Parallel trend test on rating before Pandemic

	Estimate (SE)	p-value
t_Nostalgia	-0.001 (0.001)	0.544
t_Nostalgia (CEM)	-0.001 (0.002)	0.356
Program Fixed Effect	Included	Included

Estimation Results. The estimation results, as shown in Table A2, revealed that, viewing of historical nostalgia programs increased after the pandemic onset compared to before the pandemic. Similar pattern was observed for personal nostalgia program. However, the non-nostalgia control

programs did not exhibit a positive trend after versus before the pandemic.

Table A2. CEM-DID Estimation Results

	rating
DuringPandemic_historical_nostalgia	0.133** (0.043)
DuringPandemic_personal_nostalgia	0.239*** (0.057)
DuringPandemic	-0.083 (0.047)
Prime time	0.445*** (0.050)
Genre match	0.023 (0.060)
Lead_in	0.004*** (0.000)
e	0.007 (0.017)
Monday	-0.143 (0.087)
Tuesday	-0.133 (0.084)
Wednesday	-0.145 (0.086)
Thursday	-0.139 (0.090)
Friday	-0.180** (0.061)
Saturday	-0.093 (0.099)
Summer	0.030 (0.016)
Autumn	0.004 (0.030)
Winter	-0.024 (0.055)
Constant	3.607*** (0.130)
<i>Obs</i>	3752

adj. R^2	0.567
AIC	376.920
BIC	476.600

Notes: Standard deviations are in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

AIC (Akaike's information criterion) = $2k - 2\ln(L)$; BIC (Bayesian information criterion) = $-2\ln(L) + \ln(n) * k$ L = likelihood function, n = sample size, k = number of parameters.



MS0105: Does Commercial Reform Embracing Digital Technologies Mitigate Stock Price Crash Risk?

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Does digitalization promote the effectiveness of commercial reform?

Evidence from stock price crash risk

Abstract

Improving information transparency and monitoring corporate commercial activities are the core content of commercial reform, which is conducive to creating a good commercial environment and promoting high-quality economic development. Over the past decade or so, the Chinese government implemented a series of digital technologies to accelerate the process of commercial reform. To explore its economic effectiveness, we examine how it impacts firms' stock price crash risk. We find that the commercial reform that applies digital technologies mitigates stock price crash risk and achieves so via enhancing information quality and monitoring for firms. This finding is more prominent for firms with higher levels of digitalization and innovation and those with weaker internal governance. Overall, our findings highlight a potential benefit of applying digital technologies to regulatory reform, encouraging governments to adopt digital tools to improve information environments and monitoring for firms, and thereby promoting a more stable and efficient capital market.

Keywords: commercial activities; commercial reform; digitalization; stock price crash risk; innovation; governance

JEL codes: G12; G14; G18

1 | INTRODUCTION

Commercial reform involves the improvement of laws, regulations, and systems that govern commercial activities such as registration, operation, expansion, alteration, and bankruptcy. Its primary goals are to provide commercial convenience for enterprises, ensure fair and transparent regulation of corporate activities, and promote high-quality development of commercial activities within a country. To this end, it is essential to improve the disclosures of commercial information and enhance the government monitoring of corporate commercial activities, which are the core content of commercial reform. In the era of digitalization, the Chinese government has adopted digital technologies in commercial reform to enhance its effectiveness. In this study, we investigate whether and how the government's utilization of digital technologies promotes the effectiveness of commercial reform by providing evidence from stock price crash risk.

Digitalization-applied commercial reform pertains to the utilization of digital technologies by the government to transform and upgrade government activities, with the primary objective of facilitating and regulating corporate commercial activities. The application of digital technologies serves two crucial roles in a commercial reform. First, it may improve information transparency of firms' commercial activities. By providing convenient digital commercial registration and approval services, the government can efficiently collect an extensive array of commercial information, integrate it into a comprehensible form, promptly analyze this big data, and accurately transmit it among government departments, firms, and the public. Second, digitalization may also enhance the monitoring of firms' commercial activities. Implementing digital and intelligent monitoring in the commercial reform allows the government to improve interdepartmental regulatory cooperation, promote diverse monitoring approaches, and raise firms' awareness of commercial credit. These digital monitoring tools would help standardize firm-relevant

commercial conducts, and prevent firms from engaging in suboptimal, illegal, or value-destroying commercial activities.

However, applying digital technologies in commercial reform may be ineffective in increasing information transparency and enhancing the monitoring of firms' commercial activities if we consider the associated risks and costs. Prior studies document that technological obsolescence (Acemoglu, 2002), privacy concerns (Dinev and Hart, 2006), and cybersecurity risks (Rosati et al., 2022), which are involved in the practices of digitalization, may deter firms from enhancing information transparency and monitoring. In addition, applying digital technologies to commercial reform requires considerable time and entails substantive expenses, learning costs, and uncertainties (Luo, 2022). Therefore, it is unclear whether digitalization-involved commercial reform would improve the information environment and enhance the monitoring of firms' commercial activities.

To address the open question, we investigate the impact of digitalization-applied commercial reform on stock price crash risk. Such risk results from manager opportunism that leads to overvaluation of stocks (e.g., Hutton et al., 2009; Kim et al., 2011), and is closely bound up with both information opacity and inadequate monitoring of corporate activities (e.g., Hutton et al., 2009; Kim et al., 2011). Therefore, by examining the effect of digitalization-involved commercial reform on stock price crash risk, we may shed light on the effectiveness of the government's adoption of digital technologies in commercial reform. If the digitalization-involved commercial reform improves information transparency and monitoring of firms' commercial activities, stock price crash risk is supposed to decrease.

We focus on the digitalization-involved commercial reform in China for two reasons. First, it provides a nice institutional setting for a quasi-natural experiment. Since 2014, the Chinese

government has initiated a commercial reform, wherein the Market Supervision Administration (MSA) in each city is established over different years and takes the main responsibility for implementing the commercial reform. For the reform, the municipal MSA actively adopted digital technologies to streamline corporate online applications, acceptances, reviews, license issuances, and publicity for enterprise commercial activities and to process relevant commercial information intelligently for monitoring the activities. This setup provides a reasonable context for employing a staggered difference-in-differences research design to establish causality. Second, the information environment and monitoring of commercial activities are relatively weak in China compared with those of developed countries (e.g., Piotroski and Wong, 2012). Hence, a study on the effectiveness of Chinese commercial reform and the role digitalization plays therein is potentially generalizable to other countries, especially the developing ones.

We manually collected data on the timing of establishing the MSA in each city to proxy for the timing of enacting the digitalization-involved commercial reform across cities. A staggered difference-in-differences model is applied on a propensity-score matched sample to explore whether the digitalization-involved commercial reform mitigates firms' stock price crash risk. We find evidence to suggest that the commercial reform reduces crash risk. The finding is robust to firm-fixed-effects regression analyses, controls of region effects, placebo tests, and alternative measures of crash risk. Further, we provide evidence that improved information quality and monitoring are the underlying mechanisms through which the attenuating effect of digitalization-involved commercial reform on crash risk realizes. We also find that this mitigating effect is more evident for firms with higher levels of digitalization and innovation and those with weaker internal governance.

Our paper makes two main contributions. First, we extend existing studies on the effect of

digitalization. Prior literature documents the economic consequences of corporate utilization of digital technologies (e.g., Ferreira et al., 2019; Blichfeldt and Faullanti, 2021; Ciampi et al., 2021; Matarazzo et al., 2021; Chen et al., 2022; Xu et al., 2022), and have paid little attention on government application of digital technologies. Our paper is the first to show how governmental adoption of digital technologies in a regulatory reform would achieve the desired regulatory outcomes. By exploring the impact of digitalization-applied commercial reform on crash risk, our research enriches the understanding of the economic consequences of digitalization from a macro perspective. Second, we offer some insights into the policy implementation. By showing that digitalization-involved commercial reform reduces stock price crash risk via effectively improving information transparency and monitoring of firms' commercial activities, we highlight the benefits of applying digital technologies to achieve regulatory objectives. Our study is also the first among the existing literature to document the benefits of government digitalization to firms and other stock market participants.

The remainder of the paper is organized as follows. Section 2 introduces the institutional background, and proposes the research hypothesis from two aspects – the information channel and the monitoring channel. Section 3 describes the data and methodologies for our empirical analysis. Section 4 discusses empirical results. Section 5 concludes our study.

2 | INSTITUTIONAL BACKGROUND AND RESEARCH HYPOTHESIS

2.1 | The commercial reform in China

In 2013, the Chinese government held several national conferences on reforming the commercial registration system to simplify the registration processes, ease market access, and

strengthen the supervision and management of commercial activities.¹ Following these conferences, in 2014, the Chinese government launched a commercial reform nationwide which emphasizes the application of digital technologies. Specifically, local governments in each city are required to provide online services regarding commercial activities for local firms, and use digital technologies to promote data processing as well as data sharing and integration across different departments.

In the practice of this commercial reform, the municipal governments establish different online integrated data platforms, including the National Enterprise Credit Information Publicity Platform (NECIPP), to aggregate a broad spectrum of corporate commercial information and disclose it to the public, not least the media and market participants. The information covers financial records, credit ratings, business registration, licensing, regulatory compliance, administrative penalties, commercial transactions, labor relations, shareholder changes, and intellectual property, among other aspects. Data on this diverse information are consolidated and sent to the cloud server, allowing the governments to store and further process them in a big-data platform. Then, leveraging the cloud-based repository, the governments implement a data-sharing system across various departments by using blockchain technology. This ensures trackable data records, data privacy, and seamless data flows among departments. The application of blockchain technology focuses mainly on e-certificates, business registration, and e-invoices. Under the data-sharing system, the same type of credentials and information need to be submitted only once and can be used interchangeably across departments.

¹ On 28th February 2013, the Chinese government held the Second Plenary Session of the 18th Communist Party of China (CPC) Central Committee, where it decided to reform the commercial registration system, ease the market access, and strengthen the supervision and management of corporate commercial activities. Later, on 12th November of the same year, the Third Plenary Session of the 18th CPC Central Committee further called for promoting the commercial reform.

Meanwhile, big data analytics and cloud computing are employed to analyse and scrutinize the data. On the one hand, governments use these techniques to extract useful information from big databases and gain insights into industry trends, market demands, investment details, patents, bidding, etc. They then share this information with enterprises, assisting them in bolstering their competitive edge. On the other hand, big data analytics enable governments to swiftly pinpoint operational risks, detect potential frauds, issue risk alerts, and initiate appropriate regulatory actions. Furthermore, artificial intelligence (AI) is also incorporated into some government online services. Digital features like AI service expedite the governments' processing of firms' requests by quickly providing guidance and undertaking initial reviews, such as review of business registration, effectively lightening the workload for government employees.² All the foregoing information processed by digital technologies will be used for the governmental monitoring on the firms' commercial activities; some processed information, such as the one related to abnormal business operations, will be released publicly, improving the information environments of firms.

This reform with emphasis on the application of digital technologies integrates government operations, enhances the information system, and elevates management standards for the government. To this end, the Market Supervision Administration (MSA) is established in a staggered way in each city at different years and takes the main responsibility of executing the local commercial reform. Decisions on the timing of the establishment of MSA are autonomously made by the local government in each city, and are orthogonal to firms' characteristics and events. As firms cannot anticipate the specific timing of establishing the local MSA, they are unlikely to

² More information about the application of digital technologies in the government works can be obtained from the "research report on the modernization of national governance in the digital age - experiences, challenges, and responses in using digital technologies for government governance" by the China Academy of Information and Communications Technology (CAICT). The Chinese version of this report can be accessed via the link <http://www.caict.ac.cn/kxyj/qwfb/ztbg/202212/P020221207530304282075.pdf>.

respond to the reform in advance. Therefore, it facilitates us to examine its causal impact on stock price crash risk via a staggered difference-in-differences research design.

2.2 | Hypothesis development

Stock price crash risk refers to the possibility of a sudden and significant decline in the stock price (Chen et al., 2001). It is primarily attributed to managers' opportunistic behaviours (e.g., withholding of bad news) leading to investors' overvaluation of stocks (Jin and Myers, 2006). The information asymmetry between investors and managers and the inadequate monitoring of the latter would make it difficult to detect managerial opportunism and potentially hidden corporate bad news, thereby increasing stock price crash risk (e.g., Hutton et al., 2009; Kim et al., 2011; He et al., 2019). Therefore, it is of great importance for regulators to reduce stock price crash risk by enhancing the information environment and monitoring in a commercial reform.

The utilization of digital technologies for commercial reform may enhance the government's ability to collect, process, and share various corporate commercial information, thereby improving the quality and transparency of corporate information as well as external monitoring on firms. Regarding the information acquisition, a variety of digital government services provided during the commercial reform (e.g., online application systems, self-service terminals, and mobile terminals) help firms independently complete commercial registration procedures and swiftly publish commercial information related to their products, services, sales, business expansion, etc., and disclose additional details especially those concerning the creditworthiness of their commercial activities. In such a case, the government can promptly collect a wide range of up-to-date commercial information from different firms, even before its public announcements, and form a big database for comprehensive data analyses on a timely basis.

The application of digital technologies also contributes to effective and efficient information processing. On the one hand, by utilizing advanced big data analytics and cloud computing, the government can classify and group unstructured data from various sources across firms, such as images, news, videos, and audio. This facilitates the government to track and analyze commercial information through the process of a firm's commercial activities, from product design, quality monitoring, marketing, and sales to distribution. Some processed information especially related to abnormal business operations will be published on the government's online service platforms, increasing corporate information transparency. On the other hand, by analyzing the structured data, the government can perform dynamic, real-time, and intelligent monitoring on both the upstream and downstream firms in the supply chain (Gomber et al., 2018; Cong and He, 2019). For instance, using the technique of big data analytics, governments could foresee potential operational risks and generate risk alerts once identified by the digital risk-warning system. Other diversified monitoring through internet technologies, such as e-government platforms in real-time, allows the public to monitor and report in good time any violations of rules related to firms' commercial activities, internal controls, and financial reports. This prompt reporting by the public further facilitates regulators to detect firms' non-compliant activities so that penalties and corrections can be imposed in a timely manner.

Furthermore, using digital technologies such as blockchain significantly improves information sharing across different government sectors. The government can standardize and digitize numerous commercial information, timely transmit valuable commercial information across different departments, and then release it to the public for oversight. Consequently, commercial details concerned by market participants, such as regulatory non-compliance, unethical business practices, poor financial performance, legal complications, and corporate social

irresponsibility, would become more transparent. Better information sharing would also eliminate the overlap of regulatory responsibilities among different governmental departments. This strengthens the accountability of each department and fosters better coordination across departments. As a result, the costs of monitoring decrease while the efficiency of monitoring improves.

In essence, the digitalization in commercial reform may help improve both the information environments and monitoring on the firms' commercial activities. The improved information environment would in turn reduce stock price crash risk. For instance, high information quality and transparency enable managers, based on existing commercial information, to conduct more reliable assessments on future commercial investments. This improves firms' investment efficiency and prevent managers from investing in commercial projects that have negative present values (Biddle et al., 2009; Lai et al., 2014). Meanwhile, investors in the transparent environment will have better insight into government policies and firms' commercial investment activities, thus reducing their overvaluation of stocks (Drake et al., 2009; Lee and Lee, 2015). Moreover, information transparency raises the costs for managers to commit malpractice or malfeasance in commercial activities and to hide bad commercial news from investors. As a result, the stock price crash risk will diminish.

The improved monitoring due to digitalization-applied commercial reform further contributes to the reduction in stock price crash risk by mitigating firms' agency conflicts (Fan and Wong, 2005), reducing related-party transactions (Gallery et al., 2008), preventing firms from engaging in suboptimal, illegal, or value-destroying commercial activities, and prompting firms to disclose high-quality commercial information on a timely basis. In addition, digital monitoring in commercial reform can strengthen corporate credit education as well as credit monitoring of firms

for their commercial activities. By using diverse digital information disclosure systems, governments can promptly analyze commercial credit information, release it online and issue early warnings when appropriate to relevant parties, thereby guiding and ensuring firms to adhere to laws, regulations, and ethical practices. This is instrumental in fostering the development of a robust commercial credit system and enhancing the standardization and credibility of firms' commercial activities to investors.

However, using digital technologies for a commercial reform does not necessarily increase the transparency of corporate commercial information or the external monitoring of firms' commercial activities. As such, it may not reduce stock price crash risk. This can be attributed to the potential risks and costs that are associated with technological obsolescence, privacy concerns, and cybersecurity risks, among others (Acemoglu, 2002; Dinev and Hart, 2006; Rosati et al., 2022). Technological obsolescence can lead to lower data quality and accuracy, posing challenges for the government to promptly capture the accurate commercial information of firms. Consequently, information opacity will rise (Acemoglu, 2002), impeding the effective monitoring and evaluation of firms' commercial activities and financial performance. Insufficient privacy protection could give rise to mistrust among firms and the public regarding the government's data collection and usage. As such, firms may be reluctant to disclose commercial information, hindering the external monitoring of their behaviors. Cybersecurity risks, such as cyber-attacks and data breaches, pose a threat of insecure data, information losses, or information tampering. These vulnerabilities will limit the government from obtaining accurate commercial information and reduce the monitoring effectiveness. Besides, the adoption of digital technologies brings additional expenses and uncertainties. Implementing new technologies properly requires ample time and substantial investments in hardware, software, and staff training. There are also learning costs associated with

adopting new technologies and the costs of integrating with the existing government management systems. Considering the foregoing risks and costs associated with applying digital technologies in the commercial reform, it might not be effective in improving the information environment and monitoring on firms' commercial activities and thereby reducing stock price crash risk. Based on the above discussion, we propose the following null hypothesis for empirical tests:

H1: The digitalization-applied commercial reform is unrelated to firms' stock price crash risk.

3 | DATA AND METHODOLOGIES

3.1 | Data sources and sample selection

We focus on listed companies in our study.³ Data utilized for the empirical tests come mainly from two databases: China Stock Market & Accounting Research (CSMAR) and Chinese Research Data Services (CNRDS). Data on the stock trading, financial numbers, and governance structure of firms are taken from CSMAR. Data on media news about a firm are gathered from CNRDS. We hand-collected data on the timing of establishing the Market Supervision Administration in each city by searching the Chinese Industry and Commerce Administration Yearbook and/or the official websites of the municipal governments. Data on firm-level digitalization, which are used later for our cross-sectional analysis, are obtained based on the approach proposed by Chen and Srinivasan

³ There are three reasons for focusing on listed firms for the empirical analysis of the effectiveness of digitalization-applied commercial reform. First, the commercial activities of listed firms involve a myriad of stakeholders and concern public interest, investor protection as well as the stability of capital market, among others. Their commercial information accessible via reputable government websites is trusted and sought highly by the stakeholders. Second, the government's digital platforms form an important channel through which listed firms release value-relevant information to investors. Hence, the commercial reform would affect these firms significantly. Third, listed firms often have greater influence and visibility in the market, so their commercial activities can act as a model for reference by other enterprises. In addition, from the methodological point of view, a significantly more comprehensive set of publicly available data from Chinese listed firms, relative to those from non-listed firms, enable us to perform a more rigorous empirical analysis to assure the internal validity of results.

(2023). This method employs the Python Crawler technique to search for and collate the digitalization-related keywords in firms' annual reports.

We focus on the policy implementation period of 2014-2019. Since 2014, the Chinese government across all administrative levels has implemented commercial reform, in which the Market Supervision Administration of each city introduced various digital technologies in a staggered manner. Therefore, we start our policy implementation period from 2014. Considering the confounding impact of COVID-19 on stock price crash risk, we end the policy implementation period in 2019. Meanwhile, we use a six-year period centered on the implementation year of the reform (i.e., a three-year pre-event period and a three-year post-event period) in our staggered difference-in-differences design. As a result, our treatment group only includes firms headquartered in cities that implemented commercial reform between 2014 and 2017. Therefore, our sample period starts from (ends in) 2011 (2019), three years before (since) 2014 (2017), while covering the period of the enactment of digitalization-involved commercial reform.

Our sample selection starts with the population of Chinese listed firms that have A shares traded on the Shenzhen and Shanghai Stock Exchanges for the period 2011-2019. This initial sample consists of 26,345 firm-year observations, corresponding to 4,016 firms. Following prior studies, we exclude firms that receive Special Treatment (ST or *ST) or Particular Transfer (PT), as these firms are of high delisting risk. We then tease out firms in financial industries because the disclosure requirements and accounting rules for firms in financial industries differ significantly from those in the other industries. Firms cross-listed overseas are also deleted from our analysis, as their stock prices are influenced by foreign stock markets. We further eliminate observations with negative incomes. Finally, we remove firm-year observations that do not have the necessary data to construct the variables of interest for our regression analysis. We end up with 16,237 firm-

year observations for 2,577 listed firms. Appendix 1 expounds our sample selection procedure.

3.2 | Measures of stock price crash risk

In line with previous research (e.g., Chen et al., 2001; Hutton et al., 2009; Kim et al., 2011; Chen et al., 2016), we measure stock price crash risk by the negative skewness of weekly stock returns (*NCSKEW*) and down-to-up volatility of weekly stock returns (*DUVOL*) over a fiscal year. For *NCSKEW*, we first calculate the firm-specific weekly raw returns by estimating the following equation:

$$r_{i,s} = \delta + \delta_{1,i}r_{m,s-2} + \delta_{2,i}r_{m,s-1} + \delta_{3,i}r_{m,s} + \delta_{4,i}r_{m,s+1} + \delta_{5,i}r_{m,s+2} + \varepsilon_{i,s} \quad (1)$$

where $r_{i,s}$ is the raw return of stock i in week s ; $r_{m,s}$ is the value-weighted market rate of return of all stocks in week s . In particular, the lag terms (i.e., $r_{m,s-1}$, $r_{m,s-2}$) and lead terms (i.e., $r_{m,s+1}$, $r_{m,s+2}$) are also included to allow for the nonsynchronous stock trading (Dimson, 1979). $\varepsilon_{i,s}$ is the residual return from Equation (1). The firm-specific weekly return of stock i in week s , $w_{i,s}$, is measured as the natural logarithm of one plus the residual return in Equation (1), that is, $w_{i,s} = \ln(1 + \varepsilon_{i,s})$ (e.g., Kim et al., 2011).

NCSKEW for a firm i in a fiscal year t is measured by taking the negative of the third moment of firm-specific weekly returns for each sample firm-year and dividing it by the standard deviation of firm-specific weekly returns raised to the third power:

$$NCSKEW_{i,t} = - \left[n(n-1)^{\frac{3}{2}} \sum w_{i,s}^3 \right] / \left[(n-1)(n-2) (\sum w_{i,s}^2)^{\frac{3}{2}} \right] \quad (2)$$

where n is the number of trading weeks for stock i in year t .

DUVOL captures asymmetric volatilities between the negative and positive firm-specific weekly returns and is calculated as follows:

$$DUVOL_{i,t} = \ln \left[(n_u - 1) \sum_{down} w_{i,s}^2 \right] / \left[(n_d - 1) \sum_{up} w_{i,s}^2 \right] \quad (3)$$

Where n_u (n_d) is the number of weeks in which the firm-specific weekly returns of stock i are

higher (lower) than the annual average return. The larger the negative skewness of weekly stock returns (*NCSKEW*) or the down-to-up volatility of weekly stock returns (*DUVOL*), the greater the probability of stock price crashes for the firm.

3.3 | Staggered difference-in-differences research design

Given that the municipal MSA is the primary responsible authority for commercial reform in each city, we utilize the timing of establishing municipal MSA to reflect the timing of implementing the commercial reform. MSA is established in different cities at different years, so we adopt a staggered difference-in-differences (DID) approach to evaluate the economic effect of commercial reform on firms' stock price crash risk. The DID research design requires identifying a treatment (control) group, of which firms are (not) subject to the exogenous regulatory event. Accordingly, our treatment group comprises firms headquartered in cities that established MSA from 2014 to 2017. To maintain a clean identification of the control groups for matching with treatment firms for a year t (Baker et al., 2022; Roth et al. 2023), we classify firms, headquartered in cities that did not establish MSA during the six-year period from year $t-3$ to $t+2$ nor before year $t-3$, into our control group. For example, if a firm is based in the city where an MSA was established in 2014, the control firms used to match these treatment firms in 2014 are firms with headquarters in cities that did not have an MSA at or before 2016.

The staggered DID regression model is specified as follows:

$$\begin{aligned}
 NCSKEW_{i,t} \text{ or } DUVOL_{i,t} = & \\
 & \alpha_0 + \alpha_1 Treat_t \times Post_i + \alpha_2 Treat_t + \alpha_3 size_{i,t} + \alpha_4 soe_{i,t} + \alpha_5 roe_{i,t} + \alpha_6 lev_{i,t} \\
 & + \alpha_7 salesgrowth_{i,t} + \alpha_8 cashholdings_{i,t} + \alpha_9 duality_{i,t} + \alpha_{10} boardsize_{i,t} \\
 & + \alpha_{11} topshareholdings_{i,t} + \alpha_{12} hhi_{i,t} + \alpha_{13} ceoshare_{i,t} + \alpha_{14} ret_{i,t} + \alpha_{15} sigma_{i,t} \\
 & + \alpha_{16} share_turnover_{i,t} + \alpha_{17} roa_volatility_{i,t} + year_dummies \\
 & + industry_dummies + city_dummies + \varepsilon_{i,t}
 \end{aligned} \tag{4}$$

where the dependent variable is stock price crash risk (*i.e.*, *NCSKEW* or *DUVOL*). $Treat_i$ is an indicator for the treatment and equals 1 (0) if a firm is in the treatment (control) group at year t . $Post_i$ is the time indicator which equals 1 (0) if a firm is in the three-year post- (pre-) event period that is from year t (year $t-3$) to year $t+2$ (year $t-1$). The coefficient on interaction term, $Treat_i \times Post_i$, captures changes in the stock price crash risk of treatment firms, relative to those of control firms, from the pre-event period to the post-event period. $Post_i$ is not included in the regression as this variable is potentially multicollinear with the year dummies.

Consistent with previous research (*e.g.*, Kim et al., 2011; Chen et al., 2016; Jin et al., 2022), we control for a bunch of variables that may affect stock price crash risk: firm size (*size*), state ownership (*soe*), return on equity (*roe*), financial leverage (*lev*), sales growth (*salesgrowth*), financial health (*cashholdings*), CEO-chair(wo)man duality (*duality*), board size (*boardsize*), the largest shareholder's stock holdings (*top_shareholdings*), industrial concentration (*hhi*), CEOs' stock holdings (*ceoshare*), the average weekly stock returns (*ret*), the volatility of weekly stock returns (*sigma*), share turnover (*share_turnover*), and the volatility of returns on assets (*roa_volatility*). We also include year dummies, industry dummies, and city dummies (*year_dummies*, *industry_dummies*, and *city_dummies*) in our regressions. All variables are winsorized at the 1st and 99th percentiles to avoid the impact of outliers on our results, and are defined in Appendix 2. The standard errors of coefficients in the regressions are clustered at the firm level to control for potential heteroscedasticity and autocorrelation.

3.4 | Propensity score matching

The potential systematic differences in firm characteristics between the treated firms and controlled firms may bias our analysis. To mitigate this concern, we perform the propensity score matching (PSM) and use the post-matched sample to run our DID regression. We do the matching

year by year to ensure that our staggered DID design based on the matched sample will compare the outcome of the treatment for the same treated firm, relative to that of its matched control firm, for the same year of interest. We match each treatment firm, with replacement, with a control firm by the year of establishing MSA in the city where the treatment firm is headquartered. A vector of matching covariates are selected as independent variables to run the following logit regression for the binary variable, $Treat$, to obtain the closest propensity score within a caliper of 1% in each year:

$$\begin{aligned}
 Treat_t = & \\
 & \beta_0 + \beta_1 size_t + \beta_2 roe_t + \beta_3 lev_{i,t} + \beta_4 salesgrowth_{i,t} + \beta_6 cashholdings_{i,t} \\
 & + \beta_6 boardsize_{i,t} + \beta_7 roa_volatility_{i,t} + industry_dummies + city_dummies + \varepsilon_{i,t} \quad (5)
 \end{aligned}$$

The matching covariates include firm size ($size$), return on equity (roe), financial leverage (lev), sales growth ($salesgrowth$), financial health ($cashholdings$), board size ($boardsize$), the volatility of returns on assets ($roa_volatility$), as well as the industry dummies and city dummies. After the matching, we obtain the final sample, which comprises 7,072 firm-year observations corresponding to 1,156 unique firms, for our staggered DID regression analysis.

To check the effectiveness of our matching, we perform a test of the common support in propensity-score matching. The result of the test is displayed in Figure 1. As shown in Figure 1-a, a certain difference exists in propensity scores between the treatment group and the control group prior to the matching. Figure 1-b reveals that after the matching, the distribution trends of the treatment group and the control group become similar. These results indicate that our matching substantively reduces the differences between the treated firms and the non-treated control firms.

To further check the covariate balance, we run the preceding logit regression, Model (5), by year based on the pre-matched and post-matched samples, respectively. Panel A (Panel B) of Table 1 reports the results for the pre-matched (post-matched) sample. While some covariates have

statistically significant coefficients for the pre-matched sample, the coefficients for all covariates become statistically nonsignificant after the matching. These results further support the effectiveness of our propensity-score matching.

3.5 | Descriptive statistics

Panel A of Table 2 reports the summary statistics of all variables, which are based on the sample after PSM and used in our regression analysis. The mean value of *NCSKEW* (*DUVOL*) is -0.243 (-0.195), with a standard deviation of 0.737 (0.506). The mean value of *Treat* is 0.511, indicating that approximately 51.1% of our sample firms are subject to digitalization-applied commercial reform and are classified into the treatment group, while the remaining 48.9% of firms do not experience such a reform and are classified into the control group. Panel B of Table 2 shows the Spearman correlation matrix of variables. *NCSKEW* and *DUVOL* are highly correlated, with the statistically significant correlation coefficient of 0.879, suggesting that these two variables capture the underlying same construct for stock price crash risk. The values of all other correlation coefficients are below 0.6, assuring that multicollinearity is of less concern in our regression analyses.

4 | EMPIRICAL ANALYSIS OF THE EFFECT OF DIGITALIZATION-APPLIED COMMERCIAL REFORM ON STOCK PRICE CRASH RISK

4.1 | Tests of parallel trends assumption

The validity of difference-in-differences research design relies crucially on the parallel trends assumption, which requires similar trends of the outcome variable (i.e., stock price crash risk) for both the treatment and control groups in the pre-event period (i.e., before the implementation of

digitalization-involved commercial reform) (e.g., Beck et al., 2010; Roberts and Whited, 2013).

To test this assumption, we first construct the following model to compare the stock price crash risk of treatment firms with that of control firms for our pre- versus post-event periods:

$$\begin{aligned}
NCSKEW_{i,t} \text{ or } DUVOL_{i,t} = & \\
& \beta_0 + \beta_1 Treat_t \times Pre3 + \beta_2 Treated_t \times Pre2 + \beta_3 Treated_t \times Pre1 \\
& + \beta_4 Treated_t \times Post1 + \beta_5 Treated_t \times Post2 + \beta_6 Treated_t \times Post3 + \beta_7 size_{i,t} \\
& + \beta_8 soe_{i,t} + \beta_9 roe_{i,t} + \beta_{10} lev_{i,t} + \beta_{11} salesgrowth_{i,t} + \beta_{12} cashholdings_{i,t} \\
& + \beta_{13} duality_{i,t} + \beta_{14} boardsize_{i,t} + \beta_{15} top_shareholdings_{i,t} + \beta_{16} hhi_{i,t} \\
& + \beta_{17} ceoshare_{i,t} + \beta_{18} ret_{i,t} + \beta_{19} sigma_{i,t} + \beta_{20} share_turnover_{i,t} + \beta_{21} roa_volatility_{i,t} \\
& + year_dummies + industry_dummies + city_dummies + \varepsilon_{i,t} \tag{6}
\end{aligned}$$

where *Pre3*, *Pre2*, *Pre1*, *Post1*, *Post2*, and *Post3* are the year dummies for the 6-year periods.

Panel A of Table 3 presents the results of running Model (6). The coefficients on interaction terms, *Treat*×*Pre3*, *Treat*×*Pre2*, and *Treat*×*Pre1*, are not statistically significant, supporting the parallel trends assumption for our DID research design. The coefficients on interaction terms, *Treat*×*Post3*, *Treat*×*Post2*, and *Treat*×*Post1*, are all negative and statistically significant. These results indicate that the commercial reform with the application of digitalization affects stock price crash risk in each year of our post-event sample period. From the magnitude of their coefficients, we may infer that the effect of digitalization-applied commercial reform is amplified over the post-event sample years.

We also show in Figure 2 the dynamic economic effects of digitalization-applied commercial reform in different years. It reveals that before the implementation of commercial reform, the estimated coefficient is close to 0, with no obvious difference over the years. However, after the implementation of reform, the policy effect becomes prominent. This finding lends further support to the parallel trends assumption and suggests that the reduced risk of stock price crashes is attributed to the commercial reform other than potential omitted time-series factors.

4.2 | Empirical results of the staggered difference-in-differences regression

Table B of Table 3 reports the results of our staggered difference-in-differences regression (i.e., Model (4)). The coefficients on $Treat \times Post$ are negative and statistically significant at the 1% level for both $NCSKEW$ and $DUVOL$. The point estimate on $Treat \times Post$ is -0.161 (-0.159), which accounts for 21.85% (31.42%) of one standard deviation of $NCSKEW$ ($DUVOL$) for the matched sample and is economically significant. These results reject the null hypothesis H1 and suggest that firms subject to the digitalization-applied commercial reform experience a decrease in stock price crash risk relative to those unaffected by the reform. In addition, the regression results for control variables are in line with those reported in prior studies (e.g., Kim et al., 2014; Piotroski et al., 2015; Chen et al., 2016).

4.3 | Robustness Tests

4.3.1 | Control for firm-fixed effects and within-city correlations of residuals

The commercial reform might cause exogenous changes in some unobserved firm-specific characteristics that affect firms' stock price crash risk. To allay this concern, we include firm-fixed effects and run both the univariate and multivariate regressions on $Treat \times Post$ for $NCSKEW$ and $DUVOL$. Panel A of Table 4 presents the results. All the coefficients on $Treat \times Post$ are negative with the statistical significance level of 1%. The point estimate on $Treat \times Post$ in our multivariate regression for $NCSKEW$ ($DUVOL$) is -0.145 (-0.117), which accounts for 19.67% (23.12%) of one standard deviation of $NCSKEW$ ($DUVOL$) for the matched sample and is economically significant. These results substantiate that our baseline DID regression results are immune to the bias associated with potential omitted time-invariant factors.

The residuals of observations might be correlated across firms and years within each city.

Thus, in addition to the control of city-fixed effects, we also cluster the standard errors of coefficients by city. Panel B reports the results, which appear qualitatively identical to our baseline results.

4.3.2 | Placebo test

As with previous studies (e.g., Ferrara et al., 2012; Alder et al., 2016), we conduct a placebo test to check whether our baseline regression results are free from the potential confounding effect of random factors or omitted variables. To this end, we first randomly assign our control firms into the treatment and control groups to generate a fake treatment group, $Treat^{fake}$, and associated fake commercial reform time, $Post^{fake}$, for each year. We repeat this trial for 1,000 times to enhance the efficacy of our placebo test. Figure 3 displays the distribution and corresponding p values of estimated coefficients on the interaction term, $Treat^{fake} \times Post^{fake}$. The placebo DID estimators for both *NCSKEW* and *DUVOL* are normally distributed and centered around 0. Almost all the placebo DID coefficients are positioned to the right of the baseline DID coefficient (as depicted by the vertical dotted line) and have p values higher than 0.1. In our one-sample t-test, the mean value of the placebo DID estimators shows no statistically significant difference from 0 (p=0.234 and 0.211). It can be inferred from these results that the reduction in stock price crash risk is not accidental or driven by omitted factors; rather, it is attributed to the effectiveness of commercial reform.

4.3.3 | Alternative measures of stock price crash risk

Following previous research (e.g., Hutton et al., 2009; Kim et al., 2011), we generate two alternative measures of stock price crash risk, *CRASH1* and *CRASH2*, to re-test our main hypothesis. *CRASH1* equals 1 if a firm experiences at least one crash week in the fiscal year, and

0 otherwise. *CRASH2* equals the natural logarithm of 1 plus the frequency of crash weeks of the firm during a fiscal year. We report the results for this robustness check in Panel C of Table 4. Column (1) (Column (3)) shows the results from using *CRASH1* (*CRASH2*) to test the parallel trends assumption. The coefficients on *Treat×Pre3*, *Treat×Pre2*, and *Treat×Pre1* are statistically nonsignificant, indicating that the parallel trend assumption is satisfied for the DID regression analysis. Column (2) (Column (4)) reports the results from using *CRASH1* (*CRASH2*) to run the staggered DID regression. *Treat×Post* takes on significantly negative coefficients, reinforcing the notion that firms subject to the digitalization-involved commercial reform enjoy lower stock price crash risk.

4.4 | Mechanism tests for the association between digitalization-involved commercial reform and stock price crash risk

As discussed in Section 2.2, the digitalization-applied commercial reform might enhance the information transparency and monitoring of corporate commercial activities, leading to the decrease in firms' stock price crash risk. Therefore, information transparency and monitoring are arguably two channels through which the digitalization-involved commercial reform reduces stock price crash risk. To lend credence to these mechanisms, we conduct two tests.

We first test the mediating role of information transparency, which is measured by abnormal accruals (*Ab_accrual*) and media news (*Media_coverage*). *Ab_accrual* is the abnormal accruals of a firm for a fiscal year, which is estimated using the modified Jones model (Dechow et al., 1995). *Media_coverage* is computed as the natural logarithm of a firm's total number of media news in a fiscal year. A lower (higher) value of *Ab_accrual* (*Media_coverage*) indicates higher information transparency.

We next test whether the enhanced monitoring of firms' commercial activities is another mechanism. Given the difficulty of directly measuring the monitoring level, we use two outcome-based measures, that is, related party transactions (*Related_transaction*) and other accounts receivable (*Other_receivable*), to capture the strength of monitoring on firms' commercial activities. These measurements are in line with previous research (e.g., Jiang et al., 2010; Brockman et al., 2019). *Related_transaction* is computed as the natural logarithm of the non-market-price transactions of commodities and services between a firm and its closely related business parties (i.e., its parent company or subsidiaries) during a fiscal year. *Other_receivable* is calculated as the amount of other accounts receivable, divided by the total assets of the firm, at the end of a fiscal year. A higher value of *Related_transaction* or *Other_receivable* implies a lower degree of the monitoring strength that a firm confronts. We perform the mediation analysis by running the following regressions:

$$\begin{aligned}
& Ab_accrual, Media_coverage, Relate_transaction \text{ or } Other_receivable_{i,t} = \\
& \beta_0 + \beta_1 Treat_t \times Post_i + \beta_2 Treated_t + \beta_3 size_{i,t} + \beta_4 soe_{i,t} + \beta_5 roe_{i,t} + \beta_6 lev_{i,t} \\
& + \beta_7 salesgrowth_{i,t} + \beta_8 cashholdings_{i,t} + \beta_9 duality_{i,t} + \beta_{10} boardsize_{i,t} \\
& + \beta_{11} top_shareholdings_{i,t} + \beta_{12} hhi_{i,t} + \beta_{13} ceoshare_{i,t} + \beta_{14} ret_{i,t} + \beta_{15} sigma_{i,t} \\
& + \beta_{16} share_turnover_{i,t} + \beta_{17} roa_volatility_{i,t} + year_dummies \\
& + industry_dummies + city_dummies + \varepsilon_{i,t} \tag{7}
\end{aligned}$$

$$\begin{aligned}
& NCSKEW \text{ or } DUVOL_{i,t} = \\
& = \beta_0 + \beta_1 Ab_accrual, Media_coverage, Related_transaction \text{ or } Other_receivable_{i,t} \\
& + \beta_2 size_{i,t} + \beta_3 soe_{i,t} + \beta_4 roe_{i,t} + \beta_5 lev_{i,t} + \beta_6 salesgrowth_{i,t} + \beta_7 cashholdings_{i,t} \\
& + \beta_8 duality_{i,t} + \beta_9 boardsize_{i,t} + \beta_{10} top_shareholdings_{i,t} + \beta_{11} hhi_{i,t} + \beta_{12} ceoshare_{i,t} \\
& + \beta_{13} ret_{i,t} + \beta_{14} sigma_{i,t} + \beta_{15} share_turnover_{i,t} + \beta_{16} roa_volatility_{i,t} \\
& + year_dummies + industry_dummies + city_dummies + \varepsilon_{i,t} \tag{8}
\end{aligned}$$

where the mediator variables are *Ab_accrual*, *Media_coverage*, *Related_transaction*, and *Other_receivable*, which are defined in Appendix 2. If the mediating effect exists, the coefficients

of $Treat \times Post$ for $Ab_accrual$, $Related_transaction$, and $Other_receivable$ ($Media_coverage$) in Equation (7) should be negative (positive) and statistically significant at conventional levels, while their coefficients in Equation (8) should be significantly positive (negative).

Panel A of Table 5 reports the results of the mechanism tests for the information channel. Both the coefficients of $Treat \times Post$ for the first-stage regressions (reported in Columns (1) and (4)) and those of the mediators ($Ab_accrual$ and $Media_coverage$) for the second-stage regressions (reported in Columns (2), (3), (5), and (6)) are statistically significant at the 1% level with the predicted signs. These results support the conjecture that the digitalization-involved commercial reform lowers stock price crash risk by enhancing information transparency. Panel B shows the results of the mechanism test for the monitoring channel. The coefficients on $Treat \times Post$ in Columns (1) and (4) for the first-stage regressions are negative and statistically significant. The coefficients for the mediators ($Related_transaction$ and $Other_receivable$) in Columns (2), (3), (5), and (6) for the second-stage regressions are positive and statistically significant at the 1% level. Combined, these results corroborate that the increased strength of monitoring is another channel through which the digitalization-involved commercial reform reduces stock price crash risk.⁴

4.5 | Cross-sectional analyses of the association between digitalization-applied commercial reform and stock price crash risk

We also explore how our baseline results vary under different circumstances. Apart from the government, firms might reshape their commercial processes and models by utilizing digital

⁴ Including the interaction term $Treat \times Post$ in the second-stage regression, the estimations in both mechanism tests yield similar results: the coefficients of $Treat \times Post$ and those of the mediators (i.e., $Ab_accrual$, $Related_transaction$, $Other_receivable$, and $Media_coverage$) remain statistically significant with the predicted signs.

technologies such as artificial intelligence, blockchain, cloud computing, or big data analytics. Adopting digital technologies enables firms to better transmit their internal information to the government authorities in real time. This enhanced transmission enables the government to efficiently access more comprehensive and accurate information about different aspects of the firm, such as internal operations, production, and sales, thereby facilitating the digitalization-involved commercial reform to take even stronger attenuating effect on stock price crash risk. In this regard, the favorable impact of the commercial reform on reducing crash risk is expected to be more pronounced for firms with a higher level of digitalization.

Innovation plays a crucial role in maintaining competitive advantages, achieving commercial success, and ensuring sustainable development (Le et al., 2006; Jiménez-Jiménez and Sanz-Valle, 2011). Yet, pursuing innovation not only requires long-term substantial investments but also involves significant uncertainty as the innovation outcomes are often unpredictable *inter alia* for reasons of the rapid developments of technologies by competitors and the unforeseeable changes in market demands. Hence, monitoring firms that invest largely in innovation becomes challenging. Meanwhile, managers who are more familiar with their firms enjoy the information advantages in the productivity and value of innovation projects, not least compared to external investors (Aboody and Lev, 2000). This information asymmetry makes it even more difficult to monitor these firms. Consequently, the crash risk of such firms is plausibly higher. Given that the application of digital technologies for commercial reform reduces the crash risk by enhancing information transparency and external monitoring, we expect this impact to be particularly stronger for firms with a high level of innovation. Accordingly, the negative association between digitalization-involved commercial reform and stock price crash risk should be more prominent for firms with intensive innovation activities.

Firms with strong internal governance have effective internal control mechanisms to handle diverse risks, improve the quality of information disclosures, and avoid information distortion. Moreover, strong corporate governance facilitates more effective monitoring of managers, which helps deter managers' self-serving behaviors and decreases the likelihood of them concealing negative news (e.g., Jin et al., 2022). In contrast, weak internal governance implies an opaque information environment and weak monitoring. Hence, we expect that the digitalization-applied commercial reform has a more pronounced mitigating effect on stock price crash risk for firms with weaker internal governance, as the application of digital technologies helps improve information transparency and strengthen external monitoring mechanisms for these firms.

To test the moderating effects, we create binary variables based on the full-sample medians of corporate digitalization (*Digit* and *Digit1*), corporate innovation (*Innovation* and *Innovation1*), and internal governance (*CG* and *CG1*), respectively. *Digit* equals the natural logarithm of the total number of words related to digital technologies in the annual report of a firm during a fiscal year;⁵ *Digit1* equals the digital-technology-related intangible assets disclosed in a firm's annual report, divided by the total intangible assets of the firm during a fiscal year.⁶ *Innovation* is computed by the research and development (R&D) expenditures of a firm, divided by its total sales during a fiscal year; *Innovation1* is calculated by the natural logarithm of the number of invention patents

⁵ We take the following steps to construct the variable for corporate digitalization. First, we sort out the annual reports of listed companies and extract all the text content by virtue of Python Crawler technologies. Second, we use python open source with "Jiaba" participle features to extract the text content, which involves the keywords of digital technologies based on the semantic system of national-level digital economy-related policy documents in China. The text content on digital technologies is shown in Appendix 3, which include artificial intelligence, blockchain, cloud computing, and big data analytics. Finally, we count the frequency of keywords on the digital technologies and take the natural logarithm of it as the indicator for corporate digitalization (*Digit*).

⁶ Pursuant to the Chinese accounting standards for enterprises, investments in digital technologies are recorded as intangible assets. These assets are named with keywords that are related to digital technologies, such as "digital platforms", "digital management system", "intelligent automation", or associated patents. We classify these asset items as "digital-technology-related intangible assets".

that are applied by a firm in a year and subsequently granted by the China National Intellectual Property Administration (CNIPA). CG is calculated as the number of independent directors, divided by the total number of directors of a firm, at the end of a fiscal year; $CG1$ is calculated as the number of shares held by the board members of a firm, divided by the number of its total shares outstanding, at the end of a fiscal year. The moderator variables (Dum_Digit , Dum_Digit1 , $Dum_Innovation$, $Dum_Innovation1$, Dum_CG , and Dum_CG1) equal 1 if the values of $Digit$, $Digit1$, $Innovation$, $Innovation1$, CG , and $CG1$ are higher than their sample medians, respectively, and 0 otherwise. We then augment the baseline model (4) by including the moderator variable and its interaction with $Treat \times Post$.

Table 6 shows the results of the moderation analysis. Panel A, Panel B, and Panel C report the moderating effects of firm-level digitalization, corporate innovation, and internal governance, respectively, when using $NCSKEW$ and $DUVOL$ as the proxies for stock price crash risk. The coefficients on ternary interaction terms are all statistically significant with the expected signs, indicating that the digitalization-involved commercial reform has a more prominent attenuating effect on stock price crash risk for firms with higher levels of digitalization and innovation and for those with weaker internal governance.

We further visualize the moderating effects of the three moderators in Figure 4, Figure 5, and Figure 6, respectively. The moderation effect is captured by the interaction terms between the moderator and the interaction term, $Treat \times Post$. As depicted in Figures 4-6, the digitalization-involved commercial reform has a restraining effect on firms' stock price crash risk, regardless of the level of moderators. However, for firms with greater digitalization, higher innovation, and weaker internal governance, the mitigating effect of commercial reform on stock price crash risk

is more evident. These results are thus consistent with our predictions.⁷

5 | CONCLUSION

Optimizing commercial environments and promoting high-quality economic growth are reliant on effective commercial reform, which emphasizes the improvement of commercial information disclosures and the efficient monitoring of corporate commercial activities. In recent years, the Chinese government has applied digital technologies to accelerate the process of commercial reform. To assess the effectiveness of this digitalization-involved commercial reform, we examine its impact on firms' stock price crash risk. We provide robust evidence of a causal link between digitalization-involved commercial reform and a reduction in firms' stock price crash risk. Our mediating analyses reveal that the reform improves commercial information transparency as well as monitoring of corporate commercial activities and thereby lowers the stock price crash risk of firms. We also find that higher levels of corporate digitalization and innovation and weaker internal governance amplify the mitigating effect of digitalization-involved commercial reform on crash risk.

Our findings underline the positive impact of digitalization-involved commercial reform on information environments and emphasize its potential in facilitating well-organized commercial activities and mitigating risks. In this regard, the government should make good use of digital

⁷ In addition, we test whether our baseline results differ between state-owned firms and non-state-owned firms. To this end, we generate a moderator variable (*soe*) that indicates whether a firm is state-owned, augment Model (4) with the moderator variable (*soe*) and its interaction with *Treat*×*Post*, and run the augmented regression model. In the results not tabulated, the coefficients on the ternary interaction term *Treat*×*Post*×*soe* are statistically nonsignificant, while those on the interaction term *Treat*×*Post* remain negative and statistically significant at the 1% level. This suggests that there is no statistically significant difference in the negative coefficients of *Treat*×*Post* between the state-owned and non-state-owned firms, and thus that the attenuating effect of commercial reform on crash risk does not vary with the firms' state ownership.

technologies, ideally in a way that minimizes their associated risks and costs, in order to improve firms' commercial information transparency and effectively monitor their commercial activities. In addition, our finding as to the strengthening moderating effect of firm-level digitalization also offers valuable implications for the government. To better realize the economic benefits of digitalization-involved commercial reform, the government may encourage firms to actively integrate digital technologies into corporate business structures and activities.

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Appendix 1: Sample selection

The sample selection procedure	No. of observations	No. of firms
Observations of the population of companies listed on the Shenzhen or Shanghai Stock Exchanges for the period 2011-2019	26,345	4,016
Less: observations of firms labeled with ST, ST *, or PT	(1,935)	(234)
Less: observations of firms in the financial industry	(512)	(89)
Less: observations of firms cross-listed overseas	(35)	(9)
Less: observations of loss firms	(58)	(18)
Less: observations with missing values in regressors	(7,568)	(1,089)
Sample before propensity-score matching	16,237	2,577
Final sample after propensity-score matching	7,072	1,156

Appendix 2: Summary of variable definitions

Variables	Definitions
<i>NCSKEW</i>	A measure of stock price crash risk that captures the negative skewness of firm-specific weekly stock returns over a fiscal year. See Equation (2) for detail.
<i>DUVOL</i>	The down-to-up volatility measure of stock price crash risk, calculated as the natural logarithm of the ratio of the standard deviation of firm-specific weekly stock returns in the “down” weeks to that in the “up” weeks. See Equation (3) for detail.
<i>CRASH1</i>	1 if a firm has at least one crash week in a fiscal year, and 0 otherwise. The crash week is defined as a week when the firm-specific weekly stock return falls by 3.2 standard deviations of the weekly returns for the year.
<i>CRASH2</i>	The natural logarithm of 1 plus the frequency of crash weeks of a firm during a fiscal year.
<i>Treat</i>	1 (0) for a treatment (control) firm. The treatment firm is defined as subject to the digitalization-involved commercial reform in which the Market Supervision Administration was established to introduce digital commercial registration system for improving information environments and monitoring on commercial activities of firms. The control firm is defined as not subject to the digitalization-involved commercial reform in the six-year period centered at the beginning of the year of the reform for the treatment firm, nor before the period.
<i>Post</i>	1 (0) if a treatment firm is in the three-year period since (before) the digitalization-involved commercial reform took place.
<i>Related_transaction</i>	The natural logarithm of the non-market-price transactions of commodities and services between a firm and its closely related business parties (i.e., its parent company or subsidiaries) during a fiscal year.
<i>Other_receivable</i>	The amount of other accounts receivable of a firm, divided by the total assets of the firm, at the end of a fiscal year.
<i>Media_coverage</i>	The natural logarithm of the total number of media news about a firm in a fiscal year.
<i>Ab_accrual</i>	The abnormal accruals of a firm for a fiscal year, which are estimated by using the modified Jones model (Dechow et al., 1995).
<i>Digit</i>	The natural logarithm of the total number of words related to digital technologies in the annual report of a firm during a fiscal year, and 0 if there is no such word in the annual report.
<i>Digit1</i>	The digital-technology-related intangible assets, divided by the total intangible assets of a firm, during a fiscal year.
<i>Innovation</i>	The R&D expenditures by a firm, divided by the total sales of the firm, during a fiscal year.
<i>Innovation1</i>	The natural logarithm of the number of invention patents that are applied by a firm in a year and subsequently granted by the China National Intellectual Property Administration.
<i>CG</i>	The number of independent directors, divided by the total number of directors on the board of a firm, at the end of a fiscal year.
<i>CG1</i>	The number of shares held by the board members of a firm, divided by the number of its total shares outstanding, at the end of a fiscal year.
<i>size</i>	The natural logarithm of the total assets of a firm at the end of a fiscal year.
<i>soe</i>	1 if a firm is a state-owned enterprise (i.e., the firm of which the largest ultimate shareholder pertains to a government entity), and 0 otherwise.

<i>roe</i>	Return on equity, calculated as the net profit of a firm for a fiscal year, divided by the total assets of the firm at the end of the fiscal year.
<i>lev</i>	The total debt of a firm, divided by the total assets of the firm, at the end of a fiscal year.
<i>salesgrowth</i>	The difference between the firm's sales for the current fiscal year and the sales for the previous year, divided by the sales for the previous year.
<i>cashholdings</i>	The cash flows of a firm, divided by the total assets of the firm, at the end of a fiscal year.
<i>duality</i>	1 if the CEO of a firm and the chairman/chairwoman of the board are the same person for a fiscal year.
<i>boardsize</i>	The natural logarithm of the total number of board members of a firm at the end of a fiscal year.
<i>top_shareholdings</i>	The number of shares held by the largest shareholder of a firm, divided by the number of its total shares outstanding, at the end of a fiscal year.
<i>hhi</i>	The Herfindahl-Hirschman Index computed on firms' sales for each industry in a fiscal year; industries are classified based on the industrial classification guidance released by the China Securities Regulatory Commission in 2012.
<i>ceoshare</i>	The percentage of outstanding shares owned by a firm's CEO at the end of a fiscal year.
<i>ret</i>	The mean of firm-specific weekly stock returns in a fiscal year.
<i>sigma</i>	The standard deviation of firm-specific weekly stock returns in a fiscal year.
<i>share_turnover</i>	The detrended stock trading volume, calculated as the average monthly share turnover for the current fiscal year minus the average monthly share turnover for the previous fiscal year. The monthly share turnover is the monthly trading volume divided by the number of the total floating shares in the month.
<i>roa_volatility</i>	The standard deviation of a firm's returns on assets for the recent five fiscal years.

Appendix 3: Glossary of corporate digitalization

Digitalization	Specific digital technologies
Artificial intelligence technology	Artificial intelligence, business intelligence, image understanding, investment decision support system, intelligent data analysis, machine learning, deep learning, intelligent robotics, semantic search, biometric technology, face recognition, voice recognition, identity verification, autonomous driving, and natural language processing
Blockchain technology	Blockchain, digital currency, distributed computing, differential privacy technology, and smart financial contract
Cloud computing technology	Cloud computing, stream computing, graph computing, in-memory computing, multi-party security computing, brain-like computing, green computing, cognitive computing, fusion architecture, billion level concurrency, exabyte storage, Internet of things, and information physics system
Big data technology	Big data, data mining, text mining, data visualization, heterogeneous data, credit reporting, augmented reality, mixed reality, and virtual reality

Table 1: Propensity-score matching between the treatment and control firms**Panel A: Logit regressions run by year for estimating propensity scores based on the pre-matched sample**

Variables	(1) 2014	(2) 2015	(3) 2016	(4) 2017
<i>size_t</i>	-0.1531*** (-2.7627)	-0.0831*** (-4.4918)	-0.0912* (-1.6741)	-0.0426 (-0.5204)
<i>roe_t</i>	1.8439*** (3.0658)	-0.0548 (-0.1033)	0.4761 (0.6149)	0.4937*** (3.4030)
<i>lev_t</i>	0.4215 (1.2213)	-0.0789 (-0.2174)	-0.1989 (-0.5679)	-0.1372 (-0.2663)
<i>salesgrowth_t</i>	-0.0281 (-0.7767)	-0.0068 (-0.7332)	0.0072*** (3.0177)	0.0007 (0.0658)
<i>cashholdings_t</i>	-4.6840 (-1.3649)	-1.3945 (-0.4237)	4.3861* (1.6510)	7.0830*** (4.5412)
<i>boardsize_t</i>	-0.0558 (-0.1877)	-0.0547 (-0.1928)	0.2190*** (7.7989)	0.1685 (0.4102)
<i>roa_volatility_t</i>	4.3793 (1.5004)	3.0264 (1.0426)	-1.3763 (-0.6181)	-6.5241 (-1.6002)
Observations	2,022	2,125	2,306	2,137
Pseudo R ²	0.010	0.009	0.013	0.007
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

Notes: Panel A of Table 1 reports the results of the logit regression, which is run by year for estimating propensity scores based on the pre-matched sample. The sample period ranges from 2011 to 2019. We use seven covariates - *size*, *roe*, *lev*, *salesgrowth*, *cashholdings*, *boardsize*, and *roa_volatility*. The definitions of all variables are provided in Appendix 2. The treatment indicator variable, *Treat*, equals 1 (0) for a treatment (control) firm. The treatment firm is defined as subject to the digitalization-involved commercial reform in which the Market Supervision Administration was established to introduce digital commercial registration system for improving information environments and monitoring on commercial activities of firms. The control firm is not subject to the digitalization-involved commercial reform in the six-year period centered on the beginning of the year of reform for the treatment firm, nor before the period. Industry-fixed effects and city-fixed effects are controlled in each regression, but their results are not reported for simplicity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel B: Tests of covariate balance for the post-matched sample

Variables	(1) 2014	(2) 2015	(3) 2016	(4) 2017
<i>size_t</i>	0.0154 (0.2269)	-0.0461 (-0.7385)	-0.0507 (-0.8618)	-0.0357 (-0.3790)
<i>roe_t</i>	0.4841 (0.6626)	0.1686 (0.3175)	0.2704 (0.3626)	-0.0250 (-0.0194)
<i>lev_t</i>	-0.2889 (-0.7415)	0.2375 (0.6256)	0.2313 (0.6219)	0.3527 (0.5529)
<i>salesgrowth_t</i>	0.0357 (0.9044)	0.0038 (0.6704)	-0.0003 (-0.0645)	0.0907 (1.3699)
<i>cashholdings_t</i>	0.6760 (0.6642)	0.2070 (0.2117)	0.9401 (1.0147)	-0.8769 (-0.5123)
<i>boardsize_t</i>	0.1398 (0.3888)	0.0814 (0.2485)	0.1754 (0.5541)	-0.3518 (-0.6909)
<i>roa_volatility_t</i>	0.3230 (0.4462)	-0.6001 (-0.8156)	-0.1815 (-0.1275)	0.8991 (0.4323)
Observations	1,032	1,246	1,122	1,024
Pseudo R ²	0.004	0.006	0.004	0.022
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

Notes: Panel B of Table 1 reports the results from testing the covariate balance for the matched sample used in the difference-in-differences regression of stock price crash risk. We use seven covariates - *size*, *roe*, *lev*, *salesgrowth*, *cashholdings*, *boardsize*, and *roa_volatility*. The definitions of all variables are provided in Appendix 2. The treatment indicator variable, *Treat*, equals 1 (0) for a treatment (control) firm. The treatment firm is defined as subject to the digitalization-involved commercial reform in which the Market Supervision Administration was established to introduce digital commercial registration system for improving information environments and monitoring on commercial activities of firms. The control firm is not subject to the digitalization-involved commercial reform in the six-year period centered at the beginning of the year of the reform for the treatment firm, nor before the period. We follow Leuven and Sianesi (2018) to match each treatment firm, with replacement, with a control firm by using the closest propensity score within a caliper of 1% for each year. Industry-fixed effects and city-fixed effects are controlled in each regression, but their results are not reported for simplicity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2: Univariate statistics**Panel A: Summary statistics of variables**

Variables	N	Mean	Min.	10%	25%	Median	75%	90%	Max.	Std. Dev.
<i>NCSKEW</i>	7,072	-0.243	-2.788	-1.150	-0.643	-0.212	0.189	0.597	2.267	0.737
<i>DUVOL</i>	7,072	-0.195	-1.686	-0.790	-0.486	-0.162	0.165	0.474	1.429	0.506
<i>CRASH1</i>	7,072	0.481	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.500
<i>CRASH2</i>	7,072	0.552	0.000	0.000	0.000	0.000	0.423	2.156	4.587	0.429
<i>Treat</i>	7,072	0.511	0.000	0.000	0.000	1.000	1.000	1.000	1.000	0.334
<i>Ab_accrual</i>	7,072	-0.017	-0.326	-0.096	-0.045	-0.006	0.030	0.053	0.066	0.062
<i>Media_coverage</i>	7,072	4.279	0.693	3.132	3.555	4.246	4.344	5.123	8.344	1.047
<i>Related_transaction</i>	7,072	6.159	0.000	0.000	0.000	0.000	18.000	25.279	28.788	10.782
<i>Other_receivable</i>	7,072	0.347	0.000	0.096	0.201	0.345	0.490	0.599	0.806	0.187
<i>Digit</i>	7,072	1.028	0.000	0.000	0.000	0.693	1.792	2.996	6.252	1.278
<i>Digit1</i>	7,072	0.003	0.000	0.000	0.000	0.001	0.003	0.007	0.045	0.007
<i>Innovation</i>	7,072	0.040	0.000	0.002	0.012	0.032	0.049	0.082	1.259	0.049
<i>Innovation1</i>	7,072	0.652	0.000	0.000	0.000	0.000	1.099	2.079	8.034	1.007
<i>CG</i>	7,072	0.405	0.000	0.073	0.216	0.413	0.587	0.711	0.890	0.232
<i>CG1</i>	7,072	0.076	0.000	0.000	0.013	0.054	0.091	0.133	0.652	0.125
<i>size</i>	7,072	22.275	18.964	20.775	21.336	22.082	23.017	24.044	26.297	1.281
<i>soe</i>	7,072	0.411	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.492
<i>roe</i>	7,072	0.423	0.032	0.146	0.257	0.416	0.583	0.702	0.974	0.206
<i>lev</i>	7,072	0.412	0.044	0.156	0.277	0.454	0.565	0.665	0.901	0.189
<i>salesgrowth</i>	7,072	0.395	-0.772	-0.181	-0.030	0.135	0.424	0.992	12.455	1.131
<i>cashholdings</i>	7,072	0.044	-0.208	-0.037	0.006	0.043	0.084	0.126	0.256	0.068
<i>duality</i>	7,072	0.248	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.432
<i>boardsize</i>	7,072	2.152	1.609	1.946	2.079	2.197	2.197	2.398	2.708	0.198
<i>top_shareholdings</i>	7,072	36.186	8.260	17.710	24.195	34.650	46.435	56.850	75.790	14.978
<i>hhi</i>	7,072	0.054	0.001	0.007	0.018	0.038	0.073	0.122	0.304	0.053
<i>ceoshare</i>	7,072	0.003	0.000	0.000	0.001	0.002	0.004	0.007	0.017	0.041
<i>ret</i>	7,072	0.001	-0.034	-0.010	-0.006	-0.001	0.006	0.014	0.081	0.011
<i>sigma</i>	7,072	0.062	0.018	0.038	0.045	0.056	0.071	0.097	0.243	0.026
<i>share_turnover</i>	7,072	-0.019	-0.251	-0.079	-0.033	-0.009	0.006	0.026	0.152	0.049
<i>roa_volatility</i>	7,072	0.041	0.001	0.006	0.010	0.019	0.037	0.078	0.748	0.073

Notes: Panel A of Table 2 reports the descriptive statistics of all variables used in the multivariate tests of the association between the digitalization-involved commercial reform and stock price crash risk. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. The sample period ranges from 2011 to 2019. Observations that have missing values in any of the regressors are excluded from the samples used for the multivariate tests.

Table B: Correlation matrix

Variables	<i>NCSKEW</i>	<i>DUVOL</i>	<i>Treat×Post</i>	<i>size</i>	<i>soe</i>	<i>roe</i>	<i>lev</i>	<i>salesgrowth</i>	<i>cashholdings</i>	<i>duality</i>	<i>boardsize</i>	<i>top_shareholdings</i>	<i>hhi</i>	<i>ceoshare</i>	<i>ret</i>	<i>sigma</i>	<i>share_turnover</i>	<i>roa_volatility</i>	
<i>NCSKEW</i>	1.000																		
<i>DUVOL</i>	0.879***	1.000																	
<i>Treat×Post</i>	0.005	0.003	1.000																
<i>size</i>	0.097***	0.121***	-0.043***	1.000															
<i>soe</i>	0.111***	0.115***	-0.100***	0.410***	1.000														
<i>roe</i>	0.103	0.111***	-0.047***	0.590***	0.350***	1.000													
<i>lev</i>	-0.011	-0.001	0.008	0.086***	-0.008	-0.101***	1.000												
<i>salesgrowth</i>	-0.004	-0.003	-0.004	0.027***	0.013	0.092***	0.040***	1.000											
<i>cashholdings</i>	-0.006	-0.003	0.030***	0.052***	0.029***	-0.148***	0.283***	-0.097***	1.000										
<i>duality</i>	-0.049***	-0.053***	0.050***	-0.209***	-0.292***	-0.166***	-0.008	-0.020**	-0.024***	1.000									
<i>boardsize</i>	0.051***	0.053***	-0.033***	0.277***	0.294***	0.175***	0.039***	-0.028***	0.054***	-0.182***	1.000								
<i>top_shareholdings</i>	0.067***	0.061***	-0.012	0.225***	0.208***	0.106***	0.096***	0.014*	0.076***	-0.043***	0.028***	1.000							
<i>hhi</i>	-0.010	-0.008	0.005	-0.034***	-0.055***	0.080***	-0.042***	0.132***	-0.259***	0.022***	-0.059***	-0.028***	1.000						
<i>ceoshare</i>	-0.050	-0.052***	0.042***	0.023***	-0.144***	-0.067***	0.003	-0.015*	0.001	0.069***	-0.013	0.000	0.088***	1.000					
<i>ret</i>	0.122***	0.124***	0.134***	-0.043***	-0.058***	-0.035***	0.070***	0.041***	0.086***	0.022***	-0.058***	-0.005	-0.008	0.004	1.000				
<i>sigma</i>	0.094***	0.093***	0.100***	-0.212***	-0.161***	-0.082***	-0.109***	0.058***	-0.045***	0.082***	-0.143***	-0.089***	0.057***	0.013	0.593***	1.000			
<i>share_turnover</i>	0.060***	0.063***	0.023***	0.225***	0.167***	0.171***	-0.057***	0.024***	0.073***	-0.105***	0.058***	-0.031***	-0.030***	0.028***	0.383***	0.243***	1.000		
<i>roa_volatility</i>	-0.006	0.000	0.006	-0.090***	-0.037***	-0.073***	-0.104***	-0.012	-0.008	0.012	-0.039***	-0.034***	0.061***	0.046***	0.057***	0.081***	0.047***	1.000	

Notes: Panel B of Table 2 provides the Spearman correlation coefficients for all variables involved in the baseline regression regarding the relationship between digitalization-involved commercial reform and stock price crash risk. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3: Baseline regression**Table A: Multivariate test of the parallel trends assumption**

Variables	(1) Dependent variable = $NCSKEW_t$	(2) Dependent variable = $DUVOL_t$
$Treat \times Pre3$	0.022 (0.447)	0.040 (1.220)
$Treat \times Pre2$	0.037 (0.762)	0.034 (0.984)
$Treat \times Pre1$	0.045 (0.982)	0.031 (0.943)
$Treat \times Post1$	-0.085** (-2.278)	-0.065** (-2.549)
$Treat \times Post2$	-0.100** (-2.133)	-0.076** (-2.364)
$Treat \times Post3$	-0.111** (-2.321)	-0.085*** (-2.605)
$size_t$	0.045*** (5.426)	0.043*** (7.369)
soe_t	0.087*** (5.382)	0.055*** (4.845)
roe_t	0.054 (1.181)	0.029 (0.967)
lev_t	-0.142** (-1.964)	-0.082* (-1.649)
$salesgrowth_t$	-0.019*** (-2.655)	-0.013*** (-2.914)
$cashholdings_t$	-0.122 (-1.200)	-0.096 (-1.327)
$duality_t$	-0.020 (-1.304)	-0.014 (-1.299)
$boardsize_t$	0.058* (1.713)	0.032 (1.331)
$top_shareholdings_t$	0.001*** (3.006)	0.001** (2.074)
hhi_t	-0.192 (-1.616)	-0.134 (-1.615)
$ceoshare_t$	-0.121 (-0.637)	-0.077 (-1.206)
ret_t	10.719*** (10.401)	8.970*** (11.665)
$sigma_t$	5.559*** (11.402)	3.106*** (9.029)
$share_turnover_t$	-0.001 (-0.009)	0.007 (0.070)
$roa_volatility_t$	-0.053 (-0.494)	0.024 (0.350)
Constant	-1.191*** (-6.077)	-1.009*** (-7.336)
Observations	7,072	7,072
Adj. R ²	0.098	0.100
Year-fixed effects	included	included
Industry-fixed effects	included	included
City-fixed effects	included	included

Notes: Table A of Table 3 presents the results of the multivariate test of the parallel trends assumption for the difference-in-differences regression of the association between digitalization-involved commercial reform ($Treat \times Post$) and stock price crash risk ($NCSKEW$ and $DUVOL$). The treatment indicator variable, $Treat$, equals 1 (0) for a treatment (control) firm. The treatment firm is defined as subject to the digitalization-involved commercial reform in which the Market Supervision Administration was established to introduce digital commercial registration system for improving information environments and monitoring on commercial activities of firms. The control firm is not subject to the digitalization-involved commercial reform in the six-year period centered at the beginning of the year of the reform for the treatment firm, nor before the period. $Pre3$, $Pre2$, $Pre1$, $Post1$, $Post2$, and $Post3$ are the year dummies for the 6-year periods. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2.

Table B: Difference-in-differences (DID) regression as to the association between digitalization-involved commercial reform and stock price crash risk

Variables	(1) Dependent variable = $NCSKEW_t$	(2) Dependent variable = $DUVOL_t$
$Treat \times Post$	-0.161*** (-12.579)	-0.159*** (-20.129)
$Treat$	0.726*** (13.244)	0.745*** (22.159)
$size_t$	0.046*** (4.701)	0.045*** (6.354)
soe_t	0.095*** (5.398)	0.061*** (5.023)
roe_t	0.042 (0.996)	0.018 (0.626)
lev_t	-0.121 (-1.626)	-0.073 (-1.567)
$salesgrowth_t$	-0.019** (-2.529)	-0.013*** (-2.967)
$cashholdings_t$	-0.150 (-1.372)	-0.110 (-1.469)
$duality_t$	-0.022 (-1.193)	-0.018 (-1.231)
$boardsize_t$	0.069** (2.149)	0.038* (1.802)
$top_shareholdings_t$	0.002*** (3.046)	0.001* (1.966)
hhi_t	-0.192* (-1.850)	-0.137** (-2.046)
$ceoshare_t$	-0.107*** (-3.668)	-0.069*** (-3.420)
ret_t	10.803*** (9.179)	8.994*** (10.050)
$sigma_t$	5.560*** (11.532)	3.139*** (9.108)
$share_turnover_t$	-0.026 (-0.203)	-0.019 (-0.226)
$roa_volatility_t$	-0.039 (-0.400)	0.033 (0.476)
Constant	-1.348*** (-5.888)	-1.148*** (-6.807)
Observations	7,072	7,072
Adj. R ²	0.119	0.120
Year-fixed effects	included	included
Industry-fixed effects	included	included
City-fixed effects	included	included

Notes: Table B of Table 3 reports the OLS regression results for the association between digitalization-involved commercial reform ($Treat \times Post$) and stock price crash risk ($NCSKEW$ and $DUVOL$). $Treat$ equals 1 (0) for a treatment (control) firm. The treatment firm is defined as subject to the digitalization-involved commercial reform in which the Market Supervision Administration was established to introduce digital commercial registration system for improving information environments and monitoring on commercial activities of firms. The control firm is not subject to the digitalization-involved commercial reform in the six-year period centered at the beginning of the year of the reform for the treatment firm, nor before the period. $Post$ is the time indicator variable that equals 1 (0) if a treatment firm is in the three-year period since (before) the digitalization-involved commercial reform took place. The interaction term, $Treat \times Post$, captures the impact of digitalization-involved commercial reform on stock price crash risk. The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4: Robustness tests of baseline results**Table A: Inclusion of firm-fixed effects in the DID regression**

Variables	(1) Dependent variable = $NCSKEW_t$	(2) Dependent variable = $DUVOL_t$	(3) Dependent variable = $NCSKEW_t$	(4) Dependent variable = $DUVOL_t$
<i>Treat</i> × <i>Post</i>	-0.174*** (-22.781)	-0.147*** (-33.297)	-0.145*** (-22.579)	-0.117*** (-26.476)
<i>size</i> _{<i>t</i>}			0.709*** (22.177)	0.576*** (29.019)
<i>soe</i> _{<i>t</i>}			-0.008 (-0.357)	0.030** (2.088)
<i>roe</i> _{<i>t</i>}			0.074 (0.691)	0.041 (0.806)
<i>lev</i> _{<i>t</i>}			0.126* (1.722)	0.060 (1.042)
<i>salesgrowth</i> _{<i>t</i>}			-0.053 (-0.654)	-0.040 (-0.744)
<i>cashholdings</i> _{<i>t</i>}			-0.025*** (-2.745)	-0.015*** (-2.841)
<i>duality</i> _{<i>t</i>}			-0.202* (-1.817)	-0.076 (-0.932)
<i>boardsize</i> _{<i>t</i>}			0.006 (0.199)	0.005 (0.224)
<i>top_shareholdings</i> _{<i>t</i>}			0.003 (0.040)	-0.014 (-0.285)
<i>hhi</i> _{<i>t</i>}			0.005*** (3.614)	0.002*** (2.750)
<i>ceoshare</i> _{<i>t</i>}			-0.085 (-0.645)	-0.062 (-0.804)
<i>ret</i> _{<i>t</i>}			0.058 (1.527)	0.041* (1.678)
<i>sigma</i> _{<i>t</i>}			10.659*** (8.953)	9.020*** (10.032)
<i>share_turnover</i> _{<i>t</i>}			5.681*** (9.464)	3.072*** (6.808)
<i>roa_volatility</i> _{<i>t</i>}			-0.078 (-0.438)	-0.047 (-0.410)
Constant	0.228*** (58.269)	0.148*** (54.314)	-0.205 (-0.390)	-0.820** (-2.467)
Observations	7,072	7,072	7,072	7,072
Adj. R ²	0.067	0.255	0.113	0.121
Year-fixed effects	included	included	included	included
Firm-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

Notes: Table A of Table 4 reports the firm-fixed-effects difference-in-differences regression results for the association between digitalization-involved commercial reform (*Treat*×*Post*) and stock price crash risk (*NCSKEW* and *DUVOL*). Columns (1) and (2) report the results of the univariate regression that includes *Treat*×*Post* and excludes the control variables. Columns (3) and (4) report the results of the multivariate regression that includes *Treat*×*Post* and the control variables. The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, firm dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table B: Clustering the standard errors of coefficients by city in the DID regression

Variables	(1) Dependent variable = <i>NCSKEW_t</i>	(2) Dependent variable = <i>DUVOL_t</i>	(3) Dependent variable = <i>NCSKEW_t</i>	(5) Dependent variable = <i>DUVOL_t</i>
<i>Treat</i> × <i>Post</i>	-0.174*** (-24.511)	-0.147*** (-33.297)	-0.161*** (-16.597)	-0.179*** (-37.783)
<i>Treat_t</i>			0.726*** (16.188)	0.745*** (46.444)
<i>size_t</i>			0.046*** (3.918)	0.045*** (5.279)
<i>soe_t</i>			0.095*** (5.238)	0.061*** (4.234)
<i>roe_t</i>			0.042 (1.022)	0.018 (0.605)
<i>lev_t</i>			-0.121 (-1.487)	-0.073 (-1.312)
<i>salesgrowth_t</i>			-0.019** (-2.222)	-0.013** (-2.447)
<i>cashholdings_t</i>			-0.150 (-1.585)	-0.110 (-1.373)
<i>duality_t</i>			-0.022 (-1.191)	-0.018 (-1.238)
<i>boardsize_t</i>			0.069** (2.162)	0.038** (2.145)
<i>top_shareholdings_t</i>			0.002*** (2.880)	0.001** (2.013)
<i>hhi_t</i>			-0.192** (-2.009)	-0.137 (-1.599)
<i>ceoshare_t</i>			-0.107*** (-3.900)	-0.069*** (-3.301)
<i>ret_t</i>			10.803*** (7.491)	8.994*** (7.234)
<i>sigma_t</i>			5.560*** (9.613)	3.139*** (7.520)
<i>share_turnover_t</i>			-0.026 (-0.145)	-0.019 (-0.166)
<i>roa_volatility_t</i>			-0.039 (-0.290)	0.033 (0.302)
Constant	0.230*** (88.381)	0.148*** (54.314)	-1.348*** (-4.882)	-1.148*** (-5.602)
Observations	7,072	7,072	7,072	7,072
Adj. R ²	0.067	0.256	0.119	0.120
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

Notes: Table B of Table 4 reports the OLS regression results for the association between digitalization-involved commercial reform (*Treat*×*Post*) and stock price crash risk (*NCSKEW* and *DUVOL*). Columns (1) and (2) report the results of the univariate regression that includes *Treat*×*Post* and excludes the control variables. Columns (3) and (4) report the results of the multivariate regression that includes *Treat*×*Post* and the control variables. The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by city. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table C: Alternative measures of stock price crash risk

Variables	(1) Dependent variable = $CRASH1_t$	(2) Dependent variable = $CRASH1_t$	(3) Dependent variable = $CRASH2_t$	(4) Dependent variable = $CRASH2_t$
$Treat \times Pre3$	-0.006 (-0.169)		0.000 (0.215)	
$Treat \times Pre2$	0.001 (0.034)		-0.001 (-0.639)	
$Treat \times Pre1$	0.011 (0.317)		-0.001 (-0.835)	
$Treat \times Post1$	-0.068*** (-2.629)		-0.005** (-2.289)	
$Treat \times Post2$	-0.079** (-2.379)		-0.008*** (-2.634)	
$Treat \times Post3$	-0.094*** (-2.781)		-0.011*** (-3.079)	
$Treat \times Post$		-0.160*** (-24.904)		-0.104** (-2.278)
$Treat$		0.555*** (27.580)		0.005** (2.367)
$size_t$	0.023*** (3.890)	0.028*** (4.824)	0.006*** (5.990)	0.006*** (5.764)
soe_t	0.050*** (4.086)	0.053*** (4.467)	0.009*** (4.164)	0.008*** (4.032)
roe_t	0.064** (1.977)	0.069** (2.174)	0.996*** (225.676)	0.995*** (216.508)
lev_t	-0.132*** (-2.598)	-0.155*** (-3.040)	0.017* (1.877)	0.018* (1.959)
$salesgrowth_t$	-0.012*** (-2.750)	-0.011** (-2.539)	0.000 (0.636)	0.001 (0.906)
$cashholdings_t$	-0.152* (-1.927)	-0.146* (-1.899)	-0.001 (-0.093)	-0.004 (-0.422)
$duality_t$	-0.020* (-1.750)	-0.022** (-1.967)	-0.002* (-1.909)	-0.003** (-2.100)
$boardsize_t$	0.031 (1.199)	0.038 (1.481)	-0.006 (-1.581)	-0.005 (-1.322)
$top_shareholdings_t$	0.001*** (2.788)	0.001*** (2.999)	-0.000* (-1.890)	-0.000** (-2.050)
hhi_t	-0.254*** (-2.737)	-0.241*** (-2.618)	-0.021** (-2.405)	-0.020** (-2.106)
$ceoshare_t$	-0.068*** (-3.605)	-0.077*** (-4.057)	-0.007*** (-3.100)	-0.008*** (-3.084)
ret_t	5.358*** (7.487)	5.327*** (7.463)	-0.056 (-1.029)	-0.082 (-1.443)
$sigma_t$	3.019*** (10.155)	3.113*** (10.606)	0.067** (2.244)	0.094*** (2.978)
$share_turnover_t$	0.068 (0.607)	0.067 (0.604)	0.040*** (4.801)	0.037*** (4.374)
$roa_volatility_t$	-0.003 (-0.045)	-0.019 (-0.267)	0.013* (1.752)	0.016** (1.995)
Constant	-0.229 (-1.625)	-0.442*** (-3.357)	-1.084*** (-50.929)	-1.095*** (-49.335)
Observations	7,072	7,072	7,072	7,072
Adj. R ²	0.062	0.054	0.168	0.167
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

Notes: Table C of Table 4 reports the results of the test that uses alternative measures of stock price crash risk (i.e., $CRASH1$ and $CRASH2$). Columns (1) and (3) report the results of the parallel trends assumption test using alternative measures as to $CRASH1$ and $CRASH2$, respectively. Columns (2) and (4) report the results of baseline regression using alternative measures as to $CRASH1$ and $CRASH2$, respectively. The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5: Tests of the mechanisms through which the digitalization-involved commercial reform reduces stock price crash risk

Panel A: The information channel

Variables	(1) Dependent variable = $Ab_accrual_t$	(2) Dependent variable = $NCSKEW_t$	(3) Dependent variable = $DUVOL_t$	(4) Dependent variable = $Media_coverage_t$	(5) Dependent variable = $NCSKEW_t$	(6) Dependent variable = $DUVOL_t$
<i>Treat</i> × <i>Post</i>	-0.003*** (-4.563)			0.263*** (9.248)		
<i>Treat</i>	0.002*** (3.897)			-0.252*** (-9.073)		
<i>Ab_accrual</i>		12.294*** (5.230)	11.011*** (6.925)			
<i>Media_coverage</i>					-0.188*** (-5.808)	-0.142*** (-6.442)
<i>size_t</i>	-0.006*** (-155.824)	0.123*** (7.707)	0.112*** (10.068)	0.033*** (7.461)	0.052*** (6.249)	0.048*** (8.284)
<i>soe_t</i>	0.000 (1.030)	0.086*** (5.276)	0.054*** (4.743)	-0.090*** (-8.835)	0.070*** (4.340)	0.042*** (3.717)
<i>roe_t</i>	0.028*** (134.692)	-0.292*** (-3.770)	-0.280*** (-5.252)	-0.206*** (-8.882)	0.012 (0.273)	-0.002 (-0.079)
<i>lev_t</i>	-0.001*** (-2.797)	-0.137* (-1.878)	-0.077 (-1.540)	0.105*** (3.988)	-0.125* (-1.732)	-0.069 (-1.400)
<i>salesgrowth_t</i>	0.000 (0.436)	-0.019*** (-2.679)	-0.013*** (-2.954)	0.005** (2.106)	-0.018** (-2.551)	-0.012*** (-2.786)
<i>cashholdings_t</i>	0.002*** (3.474)	-0.146 (-1.429)	-0.115 (-1.587)	0.030 (0.726)	-0.117 (-1.161)	-0.092 (-1.286)
<i>duality_t</i>	0.000 (1.076)	-0.020 (-1.316)	-0.014 (-1.308)	0.002 (0.297)	-0.019 (-1.248)	-0.013 (-1.228)
<i>boardsize_t</i>	-0.000 (-0.673)	0.058* (1.709)	0.031 (1.298)	0.041** (2.211)	0.065* (1.927)	0.037 (1.571)
<i>top_shareholdings_t</i>	-0.000 (-1.496)	0.001*** (3.095)	0.001** (2.169)	0.011*** (40.158)	0.004*** (6.028)	0.002*** (5.714)
<i>hhi_t</i>	-0.000 (-0.748)	-0.187 (-1.566)	-0.129 (-1.563)	0.094** (2.040)	-0.178 (-1.498)	-0.124 (-1.499)
<i>ceoshare_t</i>	0.000 (0.479)	-0.124*** (-4.775)	-0.079*** (-4.368)	0.065*** (5.376)	-0.110*** (-4.216)	-0.069*** (-3.765)
<i>ret_t</i>	-0.026*** (-6.313)	11.019*** (10.715)	9.222*** (12.013)	1.877*** (7.785)	11.087*** (10.786)	9.241*** (12.034)
<i>sigma_t</i>	-0.006*** (-3.404)	5.620*** (11.534)	3.171*** (9.221)	0.825*** (5.843)	5.708*** (11.714)	3.223*** (9.390)
<i>share_turnover_t</i>	-0.004*** (-5.754)	0.040 (0.274)	0.046 (0.435)	-0.960*** (-21.677)	-0.184 (-1.251)	-0.131 (-1.222)
<i>roa_volatility_t</i>	0.001** (2.475)	-0.068 (-0.649)	0.011 (0.161)	-0.072* (-1.943)	-0.064 (-0.603)	0.015 (0.224)
Constant	0.131*** (147.677)	-2.913*** (-8.537)	-2.533*** (-10.543)	2.844*** (29.404)	-0.770*** (-3.629)	-0.691*** (-4.692)
Observations	7,072	7,072	7,072	7,072	7,072	7,072
Adj. R ²	0.859	0.100	0.103	0.473	0.101	0.103
Year-fixed effects	included	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included	included
City-fixed effects	included	included	included	included	included	included

Notes: Panel A of Table 5 reports the results as to the test of the information channel through which the digitalization-involved commercial reform reduces stock price crash risk. Column (1) reports the results of the regression of abnormal accruals (*Ab_accrual*) on digitalization-involved commercial reform (*Treat*×*Post*). Columns (2) and (3) report the results of the regression of the baseline regression that is augmented by *Ab_accrual* but excludes *Treat*×*Post* and *Treat*. Column (4) reports the results of the regression of media news (*Media_coverage*) on digitalization-involved commercial reform (*Treat*×*Post*). Columns (5) and (6) report the results of the baseline regression that is augmented by *Media_coverage* but excludes *Treat*×*Post* and *Treat*. The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel B: The monitoring channel

Variables	(1) Dependent variable = <i>Related_transaction_t</i>	(2) Dependent variable = <i>NCSKEW_t</i>	(3) Dependent variable = <i>DUVOL_t</i>	(4) Dependent variable = <i>Other_receivable_t</i>	(5) Dependent variable = <i>NCSKEW_t</i>	(6) Dependent variable = <i>DUVOL_t</i>
<i>Treat</i> × <i>Post</i>	-0.153*** (-5.345)			-0.0760*** (-5.543)		
<i>Treat</i>	0.123*** (5.243)			-0.0830*** (-4.591)		
<i>Related_transaction</i>		0.018** (2.182)	0.012** (2.034)			
<i>Other_receivable</i>					0.244*** (5.195)	0.197*** (5.989)
<i>size_t</i>	0.957*** (56.503)	0.028** (2.468)	0.032*** (3.912)	0.010*** (6.681)	0.043*** (5.242)	0.041*** (7.171)
<i>soe_t</i>	0.024 (0.637)	0.087*** (5.352)	0.054*** (4.809)	0.028*** (9.221)	0.080*** (4.974)	0.049*** (4.352)
<i>roe_t</i>	0.372*** (4.039)	0.044 (0.971)	0.022 (0.739)	-0.012 (-1.433)	0.054 (1.184)	0.029 (0.964)
<i>lev_t</i>	-1.170*** (-9.203)	-0.126* (-1.734)	-0.071 (-1.429)	-0.031** (-2.345)	-0.137* (-1.914)	-0.078 (-1.583)
<i>salesgrowth_t</i>	-0.079*** (-5.921)	-0.017** (-2.464)	-0.012*** (-2.702)	-0.003** (-2.236)	-0.018*** (-2.578)	-0.013*** (-2.812)
<i>cashholdings_t</i>	1.957*** (10.121)	-0.158 (-1.547)	-0.120* (-1.652)	-0.049** (-2.461)	-0.111 (-1.097)	-0.087 (-1.208)
<i>duality_t</i>	-0.029 (-1.024)	-0.018 (-1.223)	-0.013 (-1.212)	-0.002 (-0.769)	-0.019 (-1.248)	-0.013 (-1.224)
<i>boardsize_t</i>	0.295*** (3.741)	0.053 (1.547)	0.028 (1.172)	0.004 (0.663)	0.057* (1.677)	0.031 (1.287)
<i>top_shareholdings_t</i>	0.003*** (2.746)	0.001*** (2.936)	0.001** (2.016)	-0.000*** (-3.913)	0.002*** (3.223)	0.001** (2.329)
<i>hhi_t</i>	-1.685*** (-8.291)	-0.162 (-1.349)	-0.114 (-1.359)	-0.136*** (-5.653)	-0.160 (-1.347)	-0.107 (-1.301)
<i>ceoshare_t</i>	-0.217*** (-4.525)	-0.118*** (-4.560)	-0.076*** (-4.142)	-0.017*** (-3.184)	-0.118*** (-4.552)	-0.075*** (-4.103)
<i>ret_t</i>	3.148*** (2.842)	10.686*** (10.406)	8.943*** (11.650)	-4.964*** (-26.487)	11.950*** (11.157)	9.959*** (12.541)
<i>sigma_t</i>	-3.321*** (-5.420)	5.610*** (11.468)	3.143*** (9.108)	-1.633*** (-20.181)	5.951*** (12.165)	3.427*** (9.978)
<i>share_turnover_t</i>	0.592*** (3.432)	-0.015 (-0.102)	-0.002 (-0.015)	-0.124*** (-4.265)	0.026 (0.182)	0.030 (0.284)
<i>roa_volatility_t</i>	0.050 (0.368)	-0.050 (-0.470)	0.026 (0.375)	-0.022 (-1.219)	-0.045 (-0.424)	0.030 (0.438)
Constant	-1.426*** (-3.882)	-1.278*** (-6.723)	-1.080*** (-8.059)	0.258*** (7.646)	-1.368*** (-7.244)	-1.148*** (-8.661)
Observations	7,072	7,072	7,072	7,072	7,072	7,072
Adj. R ²	0.798	0.098	0.100	0.435	0.100	0.103
Year-fixed effects	included	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included	included
City-fixed effects	included	included	included	included	included	included

Notes: Panel B of Table 5 reports the results of the test of the monitoring channel through which the digitalization-involved commercial reform reduces stock price crash risk. Column (1) reports the results of the regression of related party transactions (*Related_transaction*) on digitalization-involved commercial reform (*Treat*×*Post*). Columns (2) and (3) report the results of the baseline regression that is augmented by *Related_transaction* but excludes *Treat*×*Post* and *Treat*. Column (4) reports the results of the regression of other accounts receivable (*Other_receivable*) on digitalization-involved commercial reform (*Treat*×*Post*). Columns (5) and (6) report the results of the baseline regression that is augmented by *Other_receivable* but excludes *Treat*×*Post* and *Treat*. The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6: The moderation analysis of the association between digitalization-applied commercial reform and stock price crash risk

Panel A: The moderating effect of corporate digitalization

Variables	(1) Dependent variable = $NCSKEW_t$	(2) Dependent variable = $DUVOL_t$	(3) Dependent variable = $NCSKEW_t$	(4) Dependent variable = $DUVOL_t$
$Treat \times Post \times Dum_Digit$	-0.088** (-2.449)	-0.052** (-2.131)		
$Treat \times Post \times Dum_Digit1$			-0.071** (-2.136)	-0.053** (-2.049)
Dum_Digit	-0.026*** (-2.764)	-0.022** (-1.996)		
Dum_Digit1			-0.039*** (-2.582)	-0.036*** (-3.417)
$Treat \times Post$	-0.071*** (-11.363)	-0.046*** (-18.575)	-0.203*** (-10.654)	-0.111*** (-17.060)
$Treat$	0.721*** (12.355)	0.739*** (20.031)	0.709*** (12.136)	0.728*** (19.564)
$size_t$	0.053*** (6.016)	0.048*** (7.716)	0.051*** (5.825)	0.046*** (7.519)
soe_t	0.084*** (5.193)	0.052*** (4.594)	0.084*** (5.246)	0.052*** (4.650)
roe_t	0.074 (1.352)	0.041 (1.121)	0.079 (1.428)	0.044 (1.213)
lev_t	-0.542*** (-4.117)	-0.275*** (-2.910)	-0.552*** (-4.192)	-0.281*** (-2.981)
$salesgrowth_t$	-0.025*** (-2.989)	-0.017*** (-3.214)	-0.025*** (-3.015)	-0.017*** (-3.255)
$cashholdings_t$	0.243* (1.692)	0.082 (0.818)	0.265* (1.849)	0.099 (0.987)
$duality_t$	-0.018 (-1.193)	-0.013 (-1.196)	-0.018 (-1.190)	-0.012 (-1.178)
$boardsize_t$	0.091* (1.685)	0.061 (1.620)	0.091* (1.679)	0.061 (1.634)
$top_shareholdings_t$	0.002*** (3.252)	0.001** (2.568)	0.002*** (3.349)	0.001*** (2.712)
hhi_t	-0.023 (-0.186)	-0.036 (-0.414)	-0.042 (-0.330)	-0.052 (-0.588)
$ceoshare_t$	-0.122*** (-4.398)	-0.078*** (-4.030)	-0.121*** (-4.392)	-0.078*** (-4.019)
ret_t	4.871*** (4.193)	5.474*** (6.534)	4.815*** (4.132)	5.435*** (6.465)
$sigma_t$	6.871*** (11.961)	3.699*** (9.425)	6.835*** (11.864)	3.675*** (9.328)
$share_turnover_t$	1.147*** (3.434)	0.957*** (3.959)	1.163*** (3.479)	0.971*** (4.016)
$roa_volatility_t$	-0.117 (-1.049)	-0.023 (-0.305)	-0.110 (-0.986)	-0.018 (-0.235)
Constant	-1.655*** (-7.695)	-1.315*** (-8.656)	-1.589*** (-7.446)	-1.263*** (-8.381)
Observations	7,072	7,072	7,072	7,072
Adj. R ²	0.100	0.103	0.101	0.100
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

Notes: Panel A of Table 6 reports the results for the moderating effect of corporate digitalization ($Digit$ and $Digit1$) on the association between digitalization-involved commercial reform and stock price crash risk ($NCSKEW$ and $DUVOL$). The moderating effect is captured by the interaction term between the indicator for corporate digitalization (i.e., Dum_Digit and Dum_Digit1) and $Treat \times Post$. Dum_Digit (Dum_Digit1) equals 1 if the value of $Digit$ ($Digit1$) is higher than its full-sample median, and 0 otherwise. Columns (1) and (2) report the moderating effect of Dum_Digit . Columns (3) and (4) report the moderating effect of Dum_Digit1 . All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel B: The moderating effect of corporate innovation

Variables	(1) Dependent variable = <i>NCSKEW_t</i>	(2) Dependent variable = <i>DUVOL_t</i>	(3) Dependent variable = <i>NCSKEW_t</i>	(4) Dependent variable = <i>DUVOL_t</i>
<i>Treat</i> × <i>Post</i> × <i>Dum_Innovation</i>	-0.089** (-2.367)	-0.079*** (-3.018)		
<i>Treat</i> × <i>Post</i> × <i>Dum_Innovation1</i>			-0.148** (-2.260)	-0.097** (-1.999)
<i>Dum_Innovation</i>	-0.025 (-1.453)	-0.015 (-1.270)		
<i>Dum_Innovation1</i>			-0.017 (-0.658)	0.008 (0.434)
<i>Treat</i> × <i>Post</i>	-0.078*** (-9.592)	-0.040*** (-16.803)	-0.091*** (-10.868)	-0.105*** (-18.670)
<i>Treat</i>	0.629*** (10.658)	0.686*** (18.592)	0.638*** (10.905)	0.693*** (18.958)
<i>size_t</i>	0.044*** (5.370)	0.042*** (7.335)	0.045*** (5.398)	0.042*** (7.178)
<i>soe_t</i>	0.084*** (5.223)	0.053*** (4.671)	0.088*** (5.425)	0.055*** (4.857)
<i>roe_t</i>	0.039 (0.839)	0.019 (0.612)	0.049 (1.084)	0.027 (0.894)
<i>lev_t</i>	-0.145** (-1.999)	-0.084* (-1.685)	-0.148** (-2.047)	-0.087* (-1.758)
<i>salesgrowth_t</i>	-0.018*** (-2.603)	-0.013*** (-2.851)	-0.019*** (-2.640)	-0.013*** (-2.900)
<i>cashholdings_t</i>	-0.127 (-1.248)	-0.099 (-1.374)	-0.121 (-1.190)	-0.097 (-1.334)
<i>duality_t</i>	-0.017 (-1.134)	-0.012 (-1.096)	-0.019 (-1.292)	-0.013 (-1.276)
<i>boardsize_t</i>	0.059* (1.728)	0.032 (1.334)	0.059* (1.720)	0.032 (1.316)
<i>top_shareholdings_t</i>	0.001*** (3.021)	0.001** (2.098)	0.001*** (3.047)	0.001** (2.127)
<i>hhi_t</i>	-0.203* (-1.703)	-0.142* (-1.713)	-0.199* (-1.672)	-0.138* (-1.672)
<i>ceoshare_t</i>	-0.117*** (-4.511)	-0.074*** (-4.077)	-0.123*** (-4.747)	-0.078*** (-4.299)
<i>ret_t</i>	10.706*** (10.416)	8.955*** (11.679)	10.760*** (10.472)	8.981*** (11.714)
<i>sigma_t</i>	5.570*** (11.389)	3.118*** (9.044)	5.554*** (11.389)	3.116*** (9.070)
<i>share_turnover_t</i>	-0.012 (-0.084)	-0.000 (-0.001)	-0.009 (-0.062)	0.001 (0.005)
<i>roa_volatility_t</i>	-0.048 (-0.449)	0.028 (0.407)	-0.052 (-0.482)	0.025 (0.361)
Constant	-1.266*** (-6.643)	-1.071*** (-7.988)	-1.303*** (-6.747)	-1.077*** (-7.923)
Observations	7,072	7,072	7,072	7,072
Adj. R ²	0.099	0.101	0.098	0.100
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

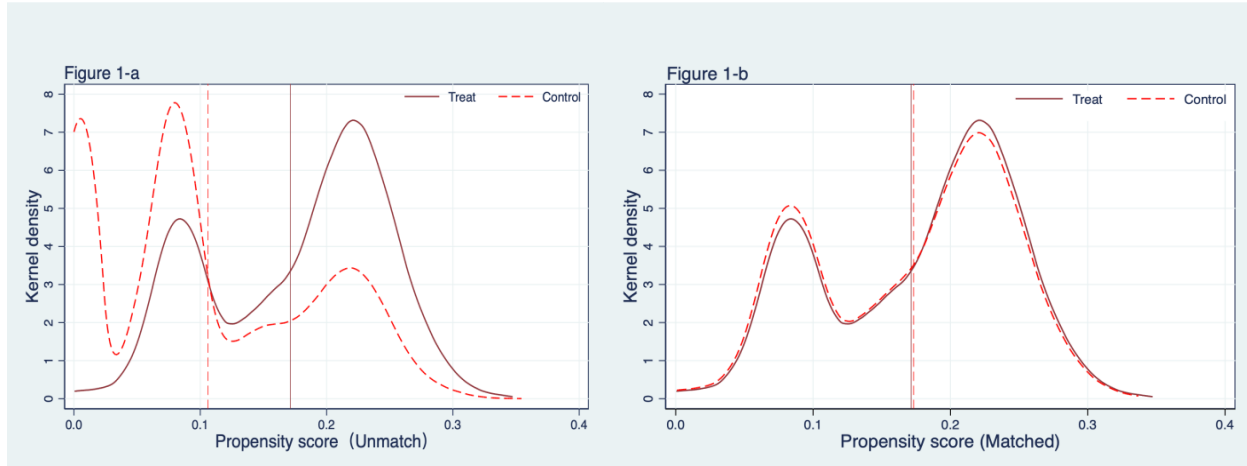
Notes: Panel B of Table 6 reports the results for the moderating effect of corporate innovation (*Innovation* and *Innovation1*) on the association between digitalization-involved commercial reform and stock price crash risk (*NCSKEW* and *DUVOL*). The moderating effect is captured by the interaction term between the indicator for corporate innovation (i.e., *Dum_Innovation* and *Dum_Innovation1*) and *Treat*×*Post*. *Dum_Innovation* (*Dum_Innovation1*) equals 1 if the value of *Innovation* (*Innovation1*) is higher than its full-sample median, and 0 otherwise. Columns (1) and (2) report the moderating effect of *Dum_Innovation*. Columns (3) and (4) report the moderating effect of *Dum_Innovation1*. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for the sake of brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel C: The moderating effect of corporate governance

Variables	(1) Dependent variable = $NCSKEW_t$	(2) Dependent variable = $DUVOL_t$	(3) Dependent variable = $NCSKEW_t$	(4) Dependent variable = $DUVOL_t$
$Treat \times Post \times Dum_CG$	0.082** (2.205)	0.053** (2.031)		
$Treat \times Post \times Dum_CG1$			0.123*** (3.293)	0.063** (2.393)
Dum_CG	-0.006 (-0.339)	-0.004 (-0.335)		
Dum_CG1			0.019 (1.228)	0.012 (1.052)
$Treat \times Post$	-0.183*** (-11.066)	-0.121*** (-18.520)	-0.181*** (-10.754)	-0.114*** (-17.942)
$Treat$	0.634*** (10.747)	0.689*** (18.735)	0.630*** (10.704)	0.686*** (18.719)
$size_t$	0.045*** (5.057)	0.043*** (6.958)	0.046*** (5.585)	0.043*** (7.526)
soe_t	0.087*** (5.387)	0.055*** (4.846)	0.086*** (5.352)	0.054*** (4.814)
roe_t	0.048 (1.043)	0.025 (0.818)	0.045 (0.983)	0.023 (0.765)
lev_t	-0.145** (-2.000)	-0.084* (-1.695)	-0.132* (-1.829)	-0.077 (-1.557)
$salesgrowth_t$	-0.019*** (-2.687)	-0.013*** (-2.936)	-0.019*** (-2.682)	-0.013*** (-2.931)
$cashholdings_t$	-0.124 (-1.215)	-0.097 (-1.343)	-0.148 (-1.449)	-0.111 (-1.528)
$duality_t$	-0.019 (-1.241)	-0.013 (-1.222)	-0.018 (-1.218)	-0.013 (-1.210)
$boardsize_t$	0.058* (1.704)	0.032 (1.321)	0.057* (1.687)	0.031 (1.300)
$top_shareholdings_t$	0.001*** (3.048)	0.001** (2.125)	0.001*** (3.012)	0.001** (2.093)
hhi_t	-0.198* (-1.664)	-0.138* (-1.674)	-0.181 (-1.519)	-0.129 (-1.556)
$ceoshare_t$	-0.122*** (-4.695)	-0.078*** (-4.263)	-0.122*** (-4.730)	-0.078*** (-4.285)
ret_t	10.774*** (10.487)	8.999*** (11.734)	10.701*** (10.429)	8.953*** (11.672)
$sigma_t$	5.546*** (11.376)	3.101*** (9.018)	5.574*** (11.445)	3.117*** (9.075)
$share_turnover_t$	-0.008 (-0.057)	0.003 (0.026)	-0.003 (-0.024)	0.006 (0.052)
$roa_volatility_t$	-0.051 (-0.477)	0.025 (0.367)	-0.054 (-0.509)	0.023 (0.341)
Constant	-1.285*** (-6.380)	-1.085*** (-7.697)	-1.322*** (-6.946)	-1.107*** (-8.255)
Observations	7,072	7,072	7,072	7,072
Adj. R ²	0.098	0.100	0.099	0.100
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
City-fixed effects	included	included	included	included

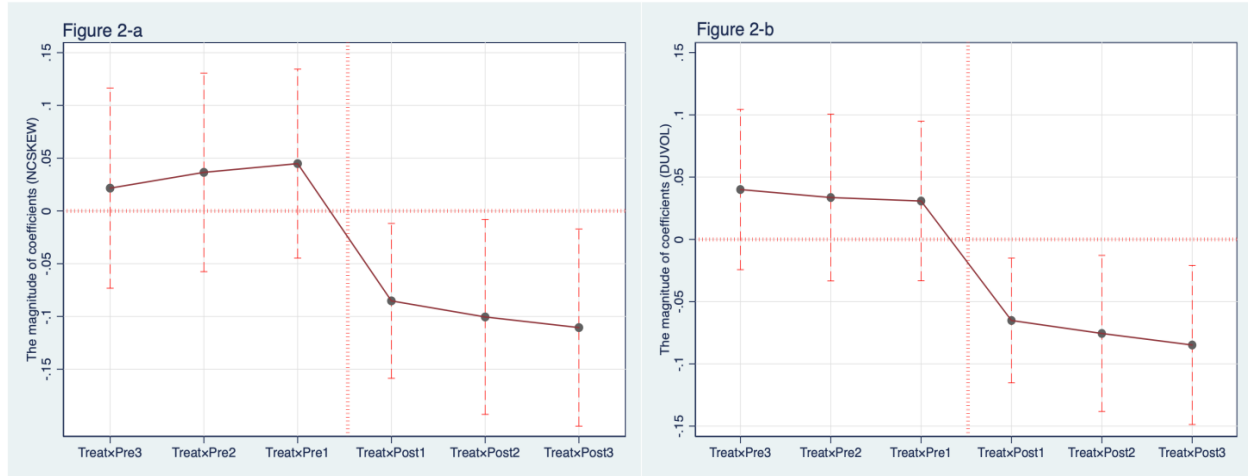
Notes: Panel C of Table 6 reports the results for the moderating effect of corporate governance (CG and $CG1$) on the association between digitalization-involved commercial reform and stock price crash risk ($NCSKEW$ and $DUVOL$). The moderating effect is captured by the interaction term between the indicator for corporate governance (i.e., Dum_CG and Dum_CG1) and $Treat \times Post$. Dum_CG (Dum_CG1) equals 1 if the value of CG ($CG1$) is higher than its full-sample median, and 0 otherwise. Columns (1) and (2) report the moderating effect of Dum_CG . Columns (3) and (4) report the moderating effect of Dum_CG1 . The sample period ranges from 2011 to 2019. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 2. Year dummies, industry dummies, and city dummies are included in each regression, but their results are not reported for brevity. The t-statistics are based on robust standard errors adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Figure 1: Kernel density distribution of propensity matching



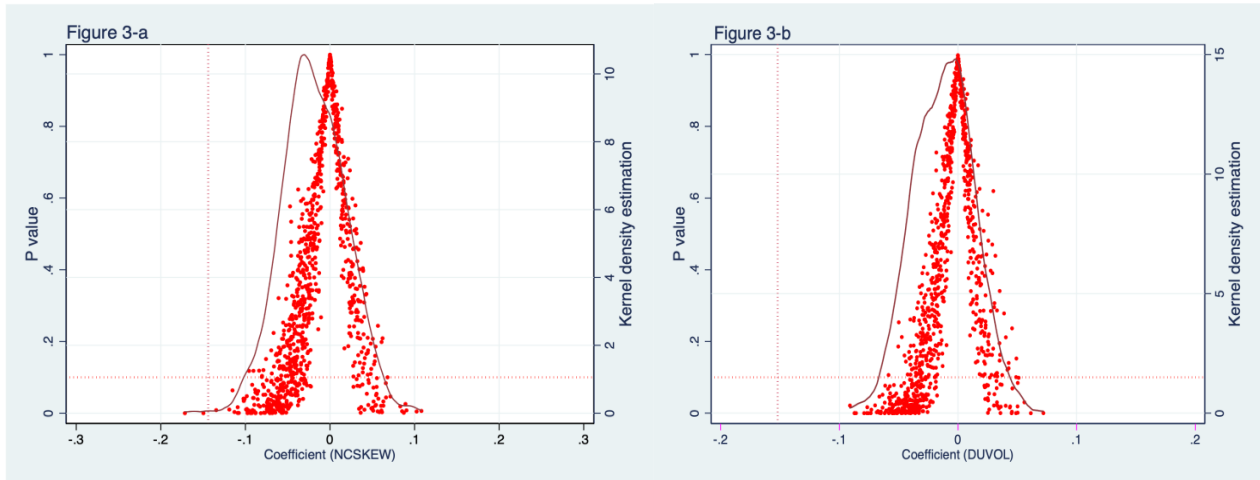
Notes: Figure 1 shows the distribution, in the form of kernel density curve, of propensity scores for the treatment group and control group before and after the matching. The horizontal axis represents the propensity scores; the vertical axis represents the probability density. The left (right) figure shows the distribution of propensity scores before (after) the matching. The sample period ranges from 2011 to 2019. The treatment indicator variable, *Treat*, equals 1 (0) for a treatment (control) firm. The treatment firm is defined as subject to the digitalization-involved commercial reform in which the Market Supervision Administration was established to introduce digital commercial registration system for improving information environments and monitoring on commercial activities of firms. The control firm is not subject to the digitalization-involved commercial reform in the six-year period centered at the beginning of the year of the reform for the treatment firm, nor before the period. The solid (dashed) curves represent the distribution of propensity scores for the treatment (control) firms. We follow Leuven and Sianesi (2018) to match each treatment firm, with replacement, with a control firm by using the closest propensity score within a caliper of 1% for each year.

Figure 2: Parallel trend test



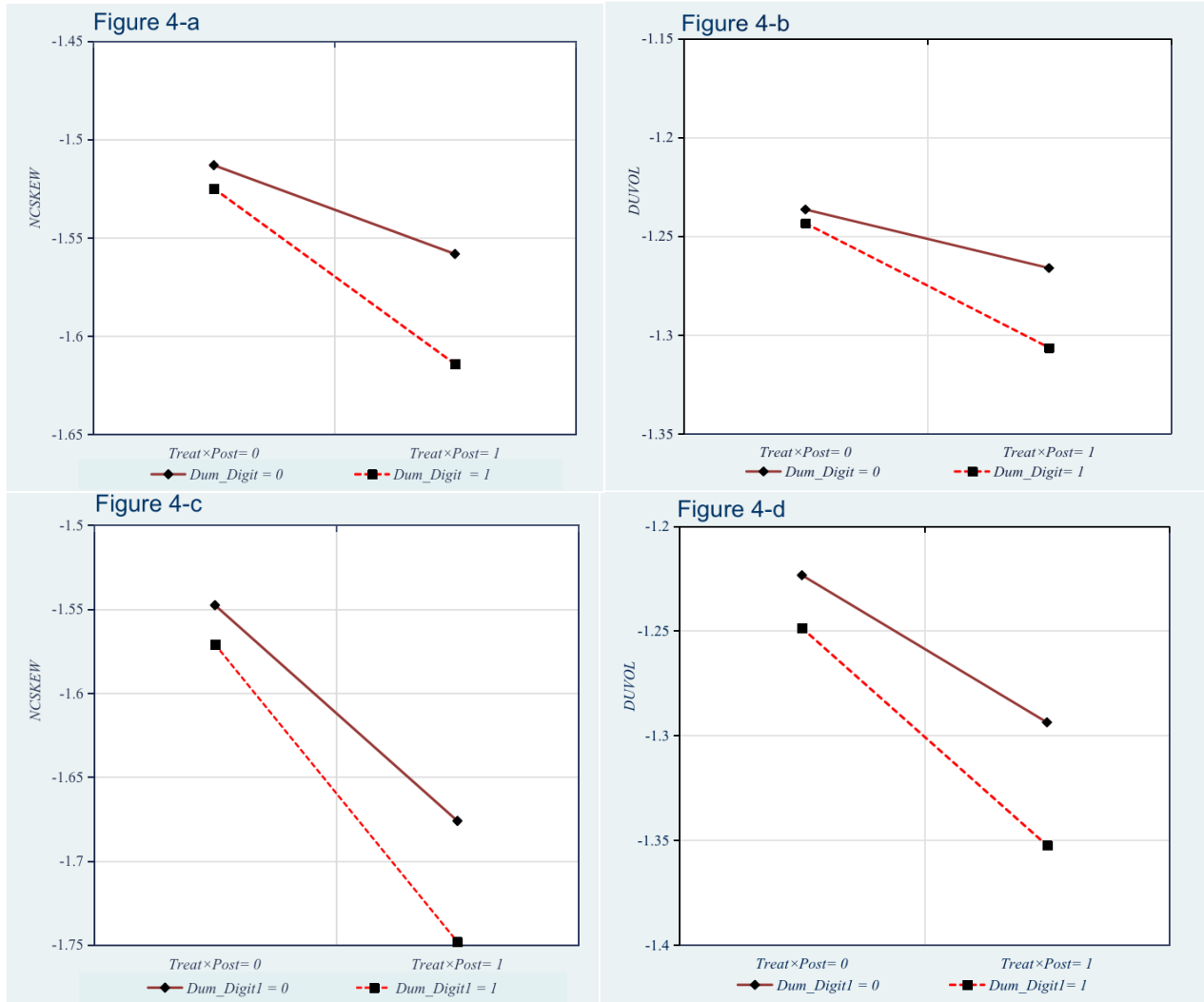
Notes: Figure 2 presents the results of the coefficient test of the parallel trends assumption for the difference-in-differences (DID) regression estimation. Specifically, Figure 2-a (2-b) shows the graphical diagnostic of parallel trend assumption for the DID regression where *NCSKEW* (*DUVOL*) is the dependent variable. The horizontal axis represents the interaction terms between *Treat* and *Pre** (*Post**); the vertical axis represents the magnitude of the coefficient of *Treat*×*Pre** (*Treat*×*Post**). The short dashed lines, which are perpendicular to the horizontal axis, are the corresponding 95% confidence interval for each coefficient. We consider a 6-year period and report the coefficients of *Treat*×*Pre** (*Treat*×*Post**), which are estimated from the regression model (6). *Pre** and *Post** include *Pre3*, *Pre2*, *Pre1*, *Post1*, *Post2*, and *Post3*, which are the year dummies for the 6-year period. The standard errors of the coefficients are adjusted for heteroskedasticity and clustered by firm. All the continuous variables are winsorized at 1 and 99 percentage points, respectively, and are defined in Appendix 2.

Figure 3: Placebo test



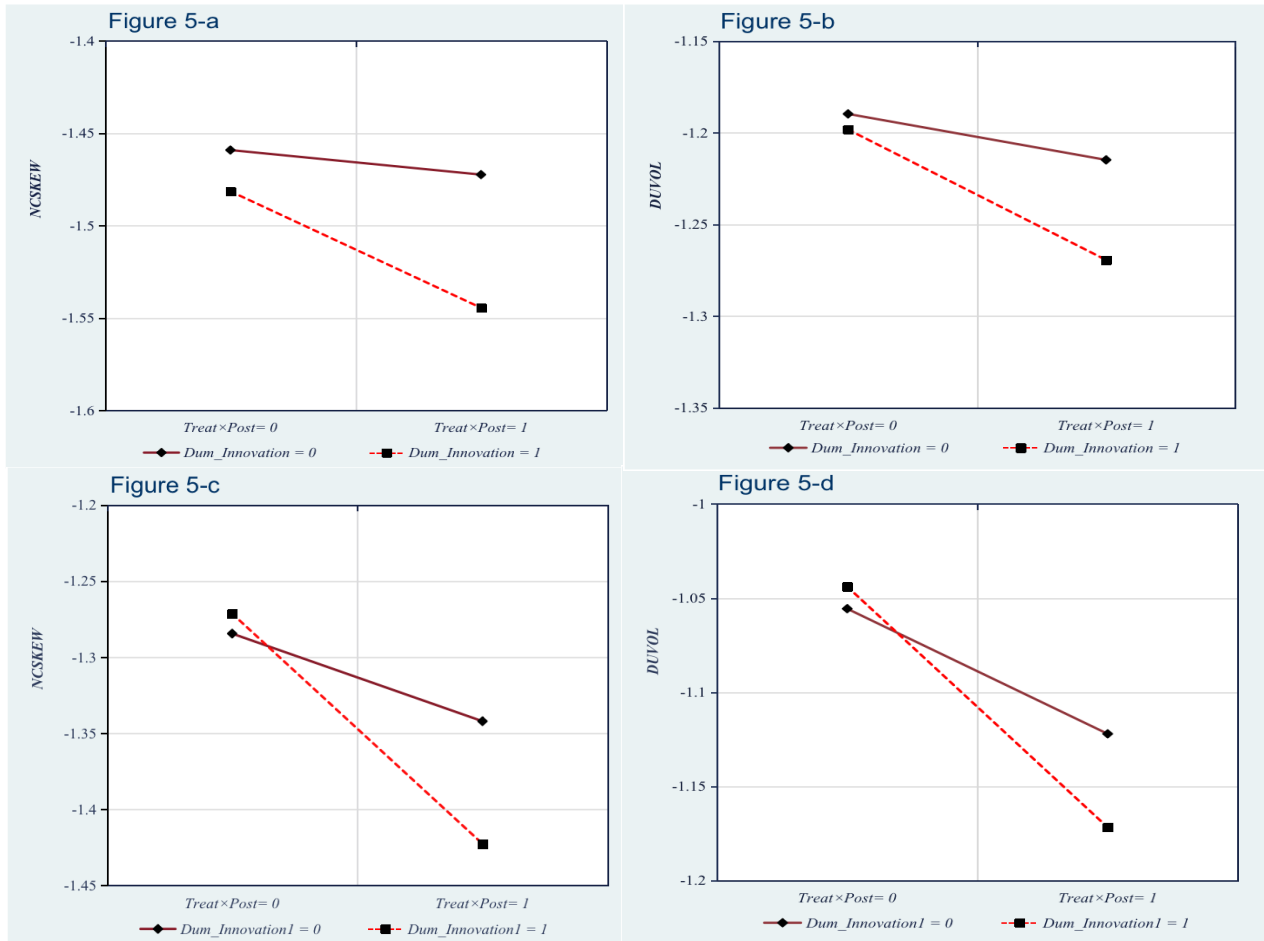
Notes: Figure 3 plots the cumulative distribution density of the 1,000 coefficient estimates in a placebo test. We randomly assign observations, which are not subject to the digitalization-involved commercial reform, to generate a fake treatment group $Treat^{fake}$ and associated fake reform time $Post^{fake}$ for each year and repeat this trial for 1,000 times to obtain 1,000 DID estimators for the interaction term $Treat^{fake} \times Post^{fake}$. The horizontal axis represents the magnitude of the estimated coefficients of the interaction term $Treat^{fake} \times Post^{fake}$; the vertical axis represents its corresponding p values on statistical significance and kernel density estimates, respectively. The dots (solid curve) represent (s) the distribution of kernel density (p values) of the estimated coefficients in the placebo test; the left (right) figure shows such results for $NCSKEW$ ($DUVOL$). The dotted vertical line represents the estimated coefficient on $Treat \times Post$ for the baseline regression of $NCSKEW$ ($DUVOL$), corresponding with the result of Column (1) (Column (2)), under Table B of Table 3.

Figure 4: The moderating effect of corporate digitalization



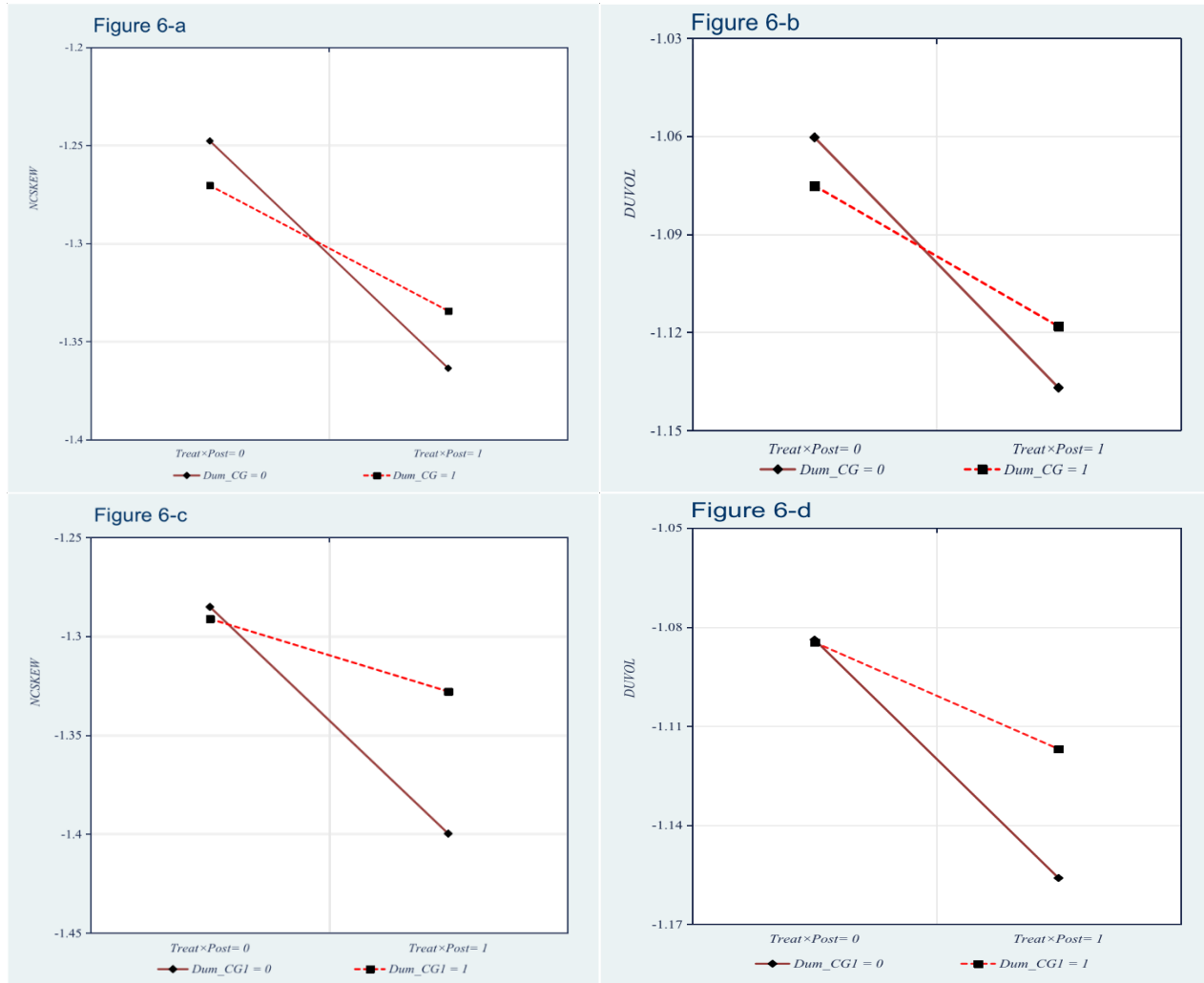
Notes: Figure 4 shows the diagram as to the linear interaction effect of corporate digitalization (*Digit* and *Digit1*) on the association between digitalization-involved commercial reform and stock price crash risk. The interaction effect is captured by the ternary interaction term between the indicator variable for corporate digitalization *Dum_Digit* (*Dum_Digit1*) and the DID interaction term *Treat* \times *Post*. *Dum_Digit* (*Dum_Digit1*) equals 1 if the value of *Digit* (*Digit1*) is higher than its full-sample median, and 0 otherwise. The horizontal axis represents the value of the interaction term *Treat* \times *Post*. The vertical axis represents the levels of stock price crash risk (i.e., *NCSKEW* and *DUVOL* for the left figure and right figure, respectively).

Figure 5: The moderation effect of corporate innovation



Notes: Figure 5 shows the diagram as to the linear interaction effect of corporate innovation (*Innovation* and *Innovation1*) on the association between digitalization-involved commercial reform and stock price crash risk. The interaction effect is captured by the interaction term between the indicator variable for corporate innovation *Dum_Innovation* (*Dum_Innovation1*) and the DID interaction term *Treat*Post*. *Dum_Innovation* (*Dum_Innovation1*) equals 1 if the value of *Innovation* (*Innovation1*) is higher than its full-sample median, and 0 otherwise. The horizontal axis represents the value of the interaction term *Treat*Post*. The vertical axis represents the levels of stock price crash risk (i.e., *NCSKEW* and *DUVOL* for the left figure and right figure, respectively).

Figure 6: The moderating effect of corporate governance



Notes: Figure 6 shows the diagram as to the linear interaction effect of corporate governance (CG and $CG1$) on the association between digitalization-involved commercial reform and stock price crash risk. The interaction effect is captured by the interaction term between the indicator variable for corporate governance Dum_CG (Dum_CG1) and the DID interaction term $Treat \times Post$. Dum_CG (Dum_CG1) equals 1 if the value of CG ($CG1$) is higher than its full-sample median, and 0 otherwise. The horizontal axis represents the value of the interaction term $Treat \times Post$, and the vertical axis represents the levels of the stock price crash risk (i.e., $NCSKEW$ and $DUVOL$ for the left figure and right figure, respectively).



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MS0106: Do Marketing-experienced Executives with Longer Tenure in Top Management Team Contribute to Higher Corporate Investment Efficiency? Evidence from Chinese Listed Companies

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Does the executives' marketing experience from their firms boost investment efficiency? Evidence from Chinese listed companies

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Data availability:

Data used in this study are available from the sources identified in the text.

Does the executives' marketing experience from their firms boost investment efficiency? Evidence from Chinese listed companies

Abstract: This study explores whether executives with more marketing experience in their firm (measured by the average length of executives holding senior marketing position in the top management team) would contribute to higher corporate investment efficiency. We define a firm's investment efficiency as the degree to which the firm's products and services resulting from its investments would meet the market demand. Based on a large sample of Chinese listed firms for the period 2010-2019, we find evidence to suggest that the more the executives obtain marketing experience from their firm, the higher its investment efficiency. This result is robust to using a high-dimensional fixed-effects regression and a stacked difference-in-differences (DID) research design to control for potential endogeneity. In particular, our DID results indicate that investment efficiency decreases following the exit of marketing-experienced executives from the firm's top management team, reinforcing the importance of their role in sustaining efficient corporate investments. Our moderation analysis further reveals that the marketing experience of executives in their current firm is more positively associated with its investment efficiency when the firm has stronger development of digital infrastructure, stronger market power, stronger social networks of executives, and higher consumer-oriented social responsibility. Overall, our results emphasize the importance of experienced marketing leadership to corporate investment efficiency, and imply that firms may take advantage of their digital infrastructures, market power, social networks and customer-oriented CSR initiatives to further enhance the positive role experienced marketing leadership plays in boosting investment efficiency of firms.

Keywords: experienced marketing leadership; corporate investment efficiency; digitalization; market power; social networks; customer-oriented CSR



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MS0107: Advancing Accounting Education: The Role of AI Language Technologies

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Advancing accounting education: The role of AI language technologies

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The rapid development of technologies has significantly influenced higher education around the world over the past decade. Especially in recent years, the advances in artificial intelligence (AI) have introduced various opportunities, while posing a range of challenges to educators in universities. In accounting education, the implication of such an advanced technology is complicated yet lacks insightful discussions. This chapter focuses on a typical AI language technology – ChatGPT, and analyzes its impact on accounting education. Accounting modules can be divided into two types. One equips students with skills and knowledge of preparing and assuring financial reports for accounting information users. The other type of modules instructs students in learning how to use accounting information for various business decision-making. We seek to do comparative and comprehensive analyses of the application of ChatGPT for student learning and assessments between these two types of modules and their implications for teaching. By this way, we shed light on how this advanced technology is shaping the future of accounting education and contribute to the ongoing debate on the integration of AI in educational settings.



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MS0108: Capital Market Implications of Corporate Digitalization: Evidence from Analyst Forecasts

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Capital market implications of corporate digitalization: Evidence from analyst forecasts

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Capital market implications of corporate digitalization: Evidence from analyst forecasts

Abstract: In recent decades, digital transformation proliferates and prevails among firms, profoundly affecting their operations, investments and information management. While applying digital technologies has pros and cons to business activities, its implications for future firm performance remain uncertain to stock market participants. This paper focuses on financial analysts, who play the role as information intermediaries in the stock market, and examines how their forecasts for firms are shaped by corporate digitalization. Based on a sample of Chinese listed firms for the period 2010-2022, we provide evidence that analysts covering firms with higher levels of digitalization are likely to make more accurate forecasts. This result is robust to using two-stage least squares regression, difference-in-differences regression, and firm-fixed-effects regression to mitigate potential endogeneity concerns. Our mediation analysis reveals that digital transformation improves firms' operational efficiency, investment efficiency and information quality, and thereby increases analyst forecast accuracy. We also find that the association between corporate digital transformation and analyst forecast accuracy is more pronounced for analysts with greater work capabilities and more information resources, as well as for firms with lower levels of innovation. Our study provides new insights into the capital market implications of corporate digitalization through the lens of financial analysts.

Keywords: digitalization; analyst forecasts; operational efficiency, investment efficiency; information quality

JEL classification: G14; G17; O33



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MS0110: Factory Location and Travel time in Thailand: How Long Can Companies Accept?

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Factory Location and Travel time in Thailand: How long can companies accept?

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Faculty of Economics, Nagasaki University

Abstract

The purpose of our study is to investigate where factories are located in Thailand, a country that has achieved economic progress by foreign direct investment. Combining the building footprints provided by Microsoft with the OSRM travel time calculation service, we detected 17 agglomerated areas, of which 5 included industrial estates. The remaining 12 areas were composed of municipal areas, including shops and houses. Travel times from the five areas to the airports were less than 78 min. Our results suggest that factories appear to be in limited areas, and that priorities travel times to airports.

Keywords Thailand; Agglomeration; Travel time; K-means clustering; and Airport

Introduction

The purpose of this study was to investigate and classify factory locations in terms of travel time to airports or ports in Thailand. Travel time is a vital issue for the expansion of companies. The eclectic paradigm generalizes that advantages, including travel time, often enhance expansion into a country (Dunning 1973, 1995). In light of the above, the location of the companies in Thailand is interesting. Since the 1960s, foreign manufacturers have expanded and established a vital international production basis while increasing their spatial distribution. In

addition, Thailand has shed light on a part of the eastern economic corridor, and studies have focused on travel time from a variety of perspectives (Phatrabuddha et al., 2018; Pueboobpaphan et al., 2022; Rungskunroch et al., 2024; Satiennam et al., 2016; Suwanno et al., 2023). The distribution of travel time from factories, however, has not been examined and clarified, despite its importance.

Materials and methods

Understanding the travel time from factories in Thailand to certain ports and airports is challenging owing to the lack of a comprehensive list of factory locations. Instead, as surrogate data for factory location, we used building footprint data from Microsoft (<https://github.com/microsoft/GlobalMLBuildingFootprints>). The data included approximately 24 million building footprints in Thailand. To calculate travel time, we applied the following procedure. First, we split the entire country of Thailand into a 2,000m-sized-square mesh. Second, we calculated the total area of the building footprint using mesh to detect the agglomeration of Moran's I statistics. Third, we computed the travel times from Suvarnabhumi Airport, Chiang Mai International Airport, and Laem Chabang Port from the agglomerated mesh using OSRM, a travel time calculation algorithm provided by OpenStreetMap (<https://project-osrm.org/>). Fourth, using the travel time for each agglomeration, agglomerations were classified using the K-means method.

Results

We found 1,932 agglomerated meshes out of 96,067 meshes distributed to 75 provinces other than Nakhon Sawan and Narathiwat. When the agglomerations were classified according to travel time, there were 17 clusters in Thailand (Appendix 1). Clusters that include industrial estates where companies are likely to be located are limited to Clusters 1, 6, 9, 13, and 15. The remaining 12 clusters are likely to be areas where residences and other buildings agglomerate in the municipality. The distribution of the travel times in the four clusters (refer to Appendix) indicates that the travel times to Suvarnabhumi airport are less than 80 min. Namely, 36.25 minutes for cluster 6; 78.90 minutes in the cluster 9; 67.37 minutes in the cluster 13; and 47.70 minutes in the cluster 15. In the rest of the cluster, located near Chiang Mai airport and including Lamphun industrial estate, the travel time to the Suvarnabhumi airport is 518.68 minutes. Instead, the travel time to Chiang Mai airport is 32.29 minutes. In summary, the agglomerated meshes are relatively close to the airports.

Discussion and conclusion

In this study, while identifying the location of a cluster of companies using the building area, we classified the cluster locations in terms of travel distance from the same location. The K-means method was used for classification, and OSRM was used to calculate the travel distance. The results revealed the following. First, there are 17 building clusters, 13 of which can be

considered municipalities, four of which are probably factory clusters. This suggests that factory clusters can be found by identifying building clusters. Second, the time required from a factory cluster to the Suvarnabhumi airport or Chiang Mai airport is approximately less than 78 min. This finding suggests that firms can tolerate this level of travel time.

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Appendices 2 Summary statistics of travel time by destination

C	Destination	N. of mesh	Total area (Unit: km ²)	Mean area by mesh	Mdn area by mesh	Mean of travel time by car (Unit: Min.)
1	Chiang_Mai	195	2,445,070.9	12,538.8	11,059.2	32.29
	Leam_Chabang					595.38
	Suvarnabhumi					518.68
2	Chiang_Mai	48	432,260.5	9,005.4	7,767.6	641.20
	Leam_Chabang					327.53
	Suvarnabhumi					283.53
3	Chiang_Mai	90	891,158.7	9,901.8	8,241.6	577.83
	Leam_Chabang					186.25
	Suvarnabhumi					126.69
4	Chiang_Mai	117	1,198,271.1	10,241.6	8,558.5	454.50
	Leam_Chabang					170.28
	Suvarnabhumi					93.65
5	Chiang_Mai	105	1,107,901.3	10,551.4	8,577.4	140.34
	Leam_Chabang					511.44
	Suvarnabhumi					434.75
6	Chiang_Mai	82	1,170,156.0	14,270.2	11,227.4	531.22
	Leam_Chabang					84.32
	Suvarnabhumi					36.25
7	Chiang_Mai	51	549,591.6	10,776.3	8,681.1	605.94
	Leam_Chabang					56.73
	Suvarnabhumi					107.36
8	Chiang_Mai	70	637,279.8	9,104.0	6,636.1	591.33
	Leam_Chabang					243.74
	Suvarnabhumi					195.98
9	Chiang_Mai	160	1,765,200.9	11,032.5	10,075.5	541.66
	Leam_Chabang					153.39
	Suvarnabhumi					78.90
10	Chiang_Mai	166	1,863,250.3	11,224.4	7,688.8	562.27
	Leam_Chabang					423.56
	Suvarnabhumi					369.52
11	Chiang_Mai	53	539,121.1	10,172.1	7,798.8	376.14
	Leam_Chabang					272.44
	Suvarnabhumi					195.74
12	Chiang_Mai	156	1,658,792.8	10,633.3	8,083.8	759.26
	Leam_Chabang					501.48
	Suvarnabhumi					456.71
13	Chiang_Mai	88	1,060,115.0	12,046.8	10,199.9	565.86
	Leam_Chabang					39.19
	Suvarnabhumi					67.37
14	Chiang_Mai	201	3,119,624.1	15,520.5	12,612.1	498.21
	Leam_Chabang					123.57
	Suvarnabhumi					47.70
15	Chiang_Mai	156	1,766,536.4	11,324.0	8,482.0	1139.38
	Leam_Chabang					734.52
	Suvarnabhumi					663.80
16	Chiang_Mai	103	898,117.1	8,719.6	7,632.9	184.56
	Leam_Chabang					690.30
	Suvarnabhumi					613.60
17	Chiang_Mai	91	975,294.1	10,717.5	7,676.8	275.67
	Leam_Chabang					392.70
	Suvarnabhumi					316.00



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MS0111: Smile Science: Unraveling the Temporal and Spatial Dynamics of Expressions in Marketing Videos

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Smile Science:

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1. Introduction

Smiles are a fundamental form of communication, frequently displayed in social interactions, but their complexity often leads to misunderstandings of their true nature. Although extensive research has explored the effects of smiles, typically using static images, the literature remains fragmented, leaving key questions unanswered, such as whether certain types of smiles are inappropriate or when it is inappropriate to smile (Bagozzi, Gopinath, and Nyer 1999). Smiles play a crucial role in shaping interpersonal interactions, influencing perceptions of attractiveness, sincerity, trustworthiness, warmth, and competence, which can encourage cooperative behavior. In marketing, smiles are strategically employed to create positive consumer impressions, enhance customer satisfaction, and increase sales (Tsai 2001; Hennig-Thurau et al. 2006).

The positive effects of smiling are attributed to emotional contagion—where emotions are transferred between individuals—and inferential processes, where observers interpret the intentions and emotions of the smiler (Hennig-Thurau et al. 2006). However, smiles can also convey nervousness, submissiveness, or a facade, potentially leading to adverse effects, such as perceptions of lower social status or reduced competence and dominance. Despite the rich findings, previous studies have been limited in capturing both the morphological and dynamic features of smiling expressions at more granular levels, particularly in wild settings (Bharadwaj et al. 2022).

To address these limitations, we propose a spatiotemporal framework to analyze the morphological and dynamic aspects of smiles in pre-recorded marketing videos. This framework accounts for the timing, duration, intensity, and asymmetry of smiles. Applying this framework to a dataset of Udemy promotional videos, we found that while an excessively large smile itself does not affect student enrollments, prolonged smiles have a positive impact, which can be reversed by facial

asymmetry and inappropriate timing. These findings have significant implications for both theory and practice, offering insights into the strategic use of smiles in marketing.

2. Literature and Framework

Smiles can be analyzed through their morphological (spatial) and dynamic (temporal) characteristics. Spatial properties include features such as intensity, asymmetry, mouth angle, and cheek raising, while temporal properties involve the duration and speed of the smile. Although research has mainly focused on spatial traits (Keltner 1995), advancements in automatic face analysis now allow for more accurate measurement of dynamic smile traits (Bharadwaj et al. 2022). In this research, we introduce a comprehensive framework for analyzing smiles, as illustrated in Figure 1.

(Insert Figure 1 about here)

Smiles can be categorized into involuntary (genuine) and voluntary (posed) types. Previous studies have demonstrated that the spatial and temporal characteristics of facial expressions can effectively differentiate between these types of smiles. For instance, genuine smiles are more symmetrical, develop gradually, and last longer, while posed smiles are often asymmetrical and shorter in duration (Schmidt, Liu, and Cohn 2006; Schmidt, VanSwearingen, and Levenstein 2005). Smile appropriateness and genuineness are critical factors that influence consumer perceptions. Emotional expressions that align with situational norms and expectations are more likely to elicit favorable responses (Van Kleef 2009). And authentic emotional displays are crucial for enhancing trust, credibility, and viewer engagement (Ekman, Levenson, and Friesen 1983). The interplay between spatial and temporal properties of smiles is also significant. Specifically, Helwig et al. (2017) elucidate that an effective smile arises from a delicate balance of mouth angle, smile extent, and dynamic symmetry, and can be expressed through various spatiotemporal patterns. Contextual influences, such as visual or verbal cues, further shape the interpretation of smiles (Krumhuber, Hyniewska, and Orłowska 2021).

3. Methodology and Estimation Results

3.1 Data Description

Udemy is a leading online learning platform with 64 million learners, offering over 210,000 courses in nearly 75 languages, where instructors worldwide often use short promotional videos to

showcase their expertise and engage potential students. Up until December 2021, we collected publicly available course data from Udemy in the finance and personal development categories. After excluding courses without preview videos or those featuring multiple instructors, our final dataset included 12,298 videos. Smiling expressions in videos were measured by extracting five frames per second. Our analytics pipeline includes face detection, emotion extraction, and metrics construction.

3.2 Measurements

Face Detection and Emotion extraction. We use a face detection algorithm to identify the presence of a presenter’s face in each extracted video frame. After detecting and aligning faces using a 3D Dense Face Alignment model, we process each face through the pre-trained EmoNet model to estimate emotion categories, continuous valence and arousal levels (Toisoul et al. 2021). This step yields probability between 0 and 1 for eight expressions, including the seven universal emotions and a neutral state. For each image identified as smiling expression (happiness), we further calculate its intensity and asymmetry.

Spatial Metrics - intensity. Intensity is derived from a composite score of valence (positivity) and arousal (excitement), measured on a 2D Cartesian system, with values ranging from -1 to +1 to capture subtle variations in the smile.

$$Intensity = \sqrt[2]{Valence^2 + Arousal^2}$$

Spatial Metrics – asymmetry. We first align the face image vertically, then segment it to create left and right composite faces, respectively. For each detected face image f of video i , asymmetry is represented by the difference between scores of the target’s left and right composite face emotion e , where e indicates one of the eight emotion categories (Banker et al. 2024).

$$FAsy_{i,f}^e = Score_{i,f,e}^{Right} - Score_{i,f,e}^{Left}$$

We then calculate the average intensity and asymmetry of all frames that display smiling face.

Temporal Metrics – duration. A second is marked as containing a smile if detected in any of the five frames per second; otherwise, it is marked as 0. We identify "permasmiles" when smiles persist for four or more consecutive seconds. Smile duration is then quantified by calculating the proportion of seconds with permasmiles relative to the total video length.

Temporal Metrics – timing. We divided the duration of a promotional video into four equal

segments (quartiles) and compiled the intensity, asymmetry, and smile duration for each segment. A variable "timing" was created to label these segments to evaluate the time-varying impact of each characteristic related to smiling.

In addition, we recorded information related to each course and its instructor as our control variables. Detailed variable definitions and summary statistics are provided in Table 1.

(Insert Table 1 about here)

3.3 Estimation results

We initially examined the main effects of the three focal characteristics on student enrolments as shown in Table 2. The results show that smile intensity may not have a strong influence on enrollments by itself ($\beta_{Intensity} = -0.035$, $p > 0.10$). In contrast, smile asymmetry significantly decreases student enrollments ($\beta_{Asymmetry} = -.093$, $p < 0.10$), while longer-lasting smiles positively impact enrollments ($\beta_{Duration} = 0.161$, $p < 0.05$). Additionally, a significant interaction between smile duration and timing ($\beta_{Duration \times timing} = -0.351$, $p < 0.05$) indicated that the positive effect of prolonged smiles decreases as the presentation progresses.

(Insert Table 2 about here)

4. Discussion

This study deepens the understanding of how spatial and temporal dimensions of smiles influence consumer perceptions in prerecorded marketing videos by introducing advanced automated facial analysis techniques that capture fine-grained metrics of smiling expressions, offering more ecologically valid insights than traditional methods. It also highlights the importance for marketers to strategically use genuine, symmetric smiles, while being mindful of the timing and potential diminishing returns of prolonged smiles in video promotions. However, future research should explore the causal mechanisms behind smile effects in controlled settings, examine gender differences in consumer reactions, and investigate screen-mediated face-to-face interactions, particularly in live-stream e-commerce environments with real-time viewer engagement.

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Figure 1. A Spatiotemporal framework of smile analytics

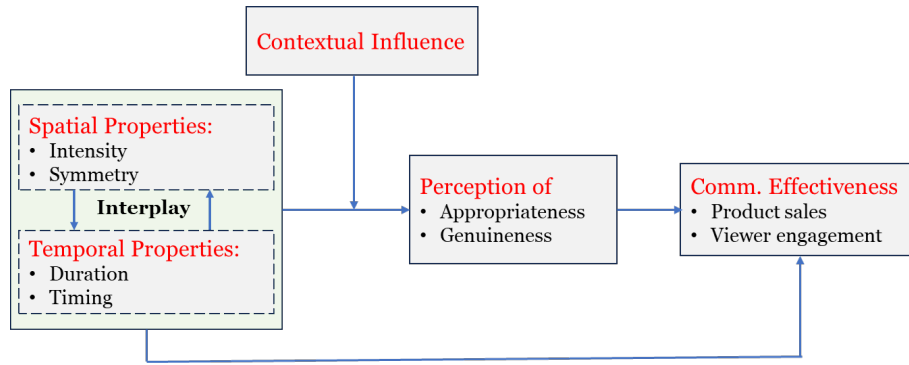


Table 1. Variable Definitions and Summary Statistics of UdeMy Data

Variable	Definition	N	Min	Max	Mean	SD
Dependent Variable						
Log (Student enrollment)	Log of the total number of students enrollment	17375	0.000	12.663	5.250	2.761
Spatial Characteristics						
Intensity	Average intensity of all frames with smiling faces	12298	0.000	0.947	0.238	0.185
Asymmetry	Average facial asymmetry of all frames with detected faces	12298	0.000	1.410	0.598	0.285
Temporal Characteristics						
Duration	Proportion of seconds of perma-smiles (a sequence of 4 or more seconds with detected smiles) to all seconds in the video	12298	0.000	1.019	0.099	0.197
Timing	Four quartiles of a video (1=1 st quartile; 2=2 nd &3 rd quartiles; 3=4 th quartile)	36894	1	3	2	0.817
Video Characteristics						
Video length	Length of the preview video	17079	4.500	7473.700	227.441	342.281
Video quality	Score calculated by a no-reference video quality assessment method	17079	0.350	1.001	0.740	0.080
Teacher Characteristics						
Male	Binary indicator of the teacher gender: male = 1, otherwise = 0	12298	0	1	0.79	0.409
Facial attractiveness	Score calculated based on SCUT-FBP5500 dataset	12298	1.533	5.173	2.929	0.476
Teacher rating	The reputation rating of the instructor	17375	0.000	5.000	4.067	1.055
Number of courses	Number of courses taught by the same teacher	17375	0	454	23.98	61.835
Log (# of students)	Log of the number of students the teacher has	17375	0.000	14.745	7.436	3.246
Course Characteristics						
Course fee	Listing price of the course	17375	0.00	199.99	16.322	24.881
Course length	The length of the course in hours	17114	0.05	189.00	3.40	6.11
Course age	Age of a course since being created in days	12298	43.00	4278.00	1064.54	766.49
Course rating	Overall rating of the course	17375	0.000	5.000	3.804	1.476
Log (length of course description)	Log of the total number of words in the course description	17375	0.000	3.401	2.374	0.643
Course categories	Category of the course: pd = 1, fin = 0	17375	0	1	0.53	0.499

Table 2. Estimated Effects for UdeMy Data (DV: Log (Students Number))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Spatial Characteristics										
Intensity	-0.035				-0.106		0.163			-0.074
Asymmetry		-0.093*			-0.123*	-0.126**		-0.065		
Temporal Characteristics										
Duration			0.161**			-0.069			1.062***	0.417**
Timing				-0.000			0.013	-0.014	0.009	
Interplay										
Intensity x Asymmetry					0.140					
Duration x Asymmetry						0.396				
Intensity x Timing							-0.072			
Asymmetry x Timing								0.027		
Duration x Timing									-0.351**	
Intensity x Duration										-0.621
Control Variables										
...										
# of observations	12298	12298	12298	36894	12298	12298	36894	36894	36894	12298
R ²	0.702	0.703	0.703	0.702	0.703	0.703	0.702	0.702	0.703	0.703



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MS0113: English as the Corporate Official Language: Why Is It So Unpopular in Japan?

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English as the Corporate Official Language: Why is it so unpopular in Japan?

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The present study investigates the implications of adopting English as the corporate official language in non-Anglophone business environments, specifically focusing on Japanese businesses and the perceptions of non-native English-speaking (NNES) professionals. It also explored the impact and implications on NNES's use of English in the workplace. English is Japan's de facto second official language and first foreign language, and its use is growing in various industries. Nonetheless, the study indicated that the majority of Japanese workplaces lack cultural and linguistic diversity, making it unnecessary for the corporation to use English as a business lingua franca internally. Japanese businesspeople view the corporate policy of mandating the exclusive use of English in the workplace as impractical. Also, NNESs who work in ENL (English as Native Language) corporate environments encounter significant challenges in informal conversations and social settings, which can lead to feelings of exclusion and disadvantage. Cultural differences exacerbate these challenges, highlighting the need for greater awareness and support. The study emphasizes the importance of understanding the distinctive difference between the English used by NNES and ENL in building workplace relationships. It also calls for real-life communicative practice over traditional language learning methods. It advocates for inclusive language management policies that recognize NNES English's unique qualities, aiming to create a more equitable and supportive corporate environment for NNES professionals.

Keywords: Global English, Non-native English, English as a lingua franca, Cross-cultural communication, English as International Business Language

1. Introduction

English has emerged as a widely adopted lingua franca around the world, resulting in a significant rise in its importance within the context of international business. Non-Anglophone companies, including those in Japan, use English as their official or common language (Charles, 2007; Neeley, 2012; 2017). Recently, scholars in multiple academic disciplines have been studying language-related issues in international business (IB) (e.g., Brannen et al., 2014; Harzing & Feely, 2008).

2. Literature and Framework

International business researchers frequently associate multilingualism or language diversity in business with negative connotations. They contend that headquarters and local operations must manage and coordinate the communication difficulties caused by the diversity of languages for MNEs (Harzing & Feely, 2008; Harzing, Köster, & Magner, 2011; Luo & Shenkar, 2006). Therefore, it seems the easiest solution is to use English as the common corporate language for many multinational corporations, even non-Anglophone MNEs.

However, although the goal of a common corporate language is to enhance internal communications and foster corporate harmony, it can also operate as a linguistic barrier in multinational enterprises (MNEs) since it is not the native language of the companies' employees in many circumstances.

Beechler and Bird (1999) investigated Japanese multinational corporations, where English was the common corporate language for global operations. They discovered that using English as a common language of communication did not eradicate the significant language barrier between Japanese expatriates and local staff. Further, Tenzer et al. (2013) studied the trust-building of multinational teams (MNT) and found that using English as a common language did not contribute to building trust among MNT members.

The Global English paradigm

The Global English paradigm encompasses the concepts of world English, English as a lingua franca (ELF), and English as an international language (EIL), as well as similar concepts such as translanguaging and the multilingual turn. The underlining belief of the paradigm is that that English is

no longer the sole property of native English speakers (NESs) but a global language utilized by millions of individuals with diverse linguistic and cultural backgrounds.

The paradigm's fundamental premise is empowering and has emancipating effects on NNESs who, like me, have struggled with the English language. It has had a substantial impact on how non-native English speakers (NNESs) should perceive their English use and English education, focusing on English as a common language used by speakers with different first languages and how NNESs use it when there is no other option.

English used by NNESs differs from English as a native language (ENL) and English as a foreign language (EFL). NNESs use English as a means of communication to achieve their goals. Therefore, the paradigm's focus is on effective communication rather than on the grammar, vocabulary, or accents of native speakers. NNESs often use English without native speakers, and in NNES communication, NESs frequently find themselves in a minority of interlocutors.

Scholars found English to be dynamic, creative, hybrid, and fluid when used in the internal and external communications of globally operating MNEs. It does not conform to native English norms, and the norms of native English speakers are irrelevant (Ehrenreich, 2010; Kankaanranta & Planken, 2010).

3. Method and Results

The study involved interviews and an online survey of 125 Japanese business professionals, primarily bilingual and using English for their businesses. The interview data was collected using semi-structured and open-ended questions to explore their experiences, opinions, and feelings about using English.

The data was transcribed or paraphrased in the original languages used during the interviews, and the data was coded and categorized into themes using MAXQDA software.

The study revealed that the majority of Japanese workplaces remained highly monolingual and lacked diversity in terms of languages and cultures, including even internationally known firms. English is considered increasingly necessary in a variety of industries in Japan, including large MNEs as well as small and medium-sized businesses.

Japanese corporations are increasingly using English, but to a limited extent. As mentioned above, English is rarely used in daily business. Also, it was mentioned that most employees of well-known large MNEs do not use English for their work, such as Participant 14 who mentioned that his experience with consumer product manufacturers where very few employees used English.

In addition, online survey responses from a wider range of participants also revealed that Japanese businesspeople rarely use English at work.

4. Discussion

The participants in the current study used English as a lingua franca when speaking with people whose native language is different from theirs. They believe the language used should be the one that facilitates the most effective communication. They believe it is absurd to insist on Japanese employees to communicate in English when they can just as easily do so in Japanese, and that requiring them to do so is irrational.

NNESs in the English-Native Language (ENL) workplace face various challenges, including difficulty in small talk and casual conversations, which are crucial for establishing positive interpersonal connections. Cultural differences and the lack of awareness among NNESs about the unique features of NNE (Native English) can lead to feelings of marginalization and difficulty building trust.

NNESs working for Japanese branches of American corporations may experience a sense of alienation in environments where English as a native language (ENL) is the prevailing norm. The firms' management does not distinguish between ENL and NNE, viewing NNESs as individuals still in the process of learning English. This lack of awareness may lead to psychological stress and anxiety for NNESs.

NNESs use English when communicating with individuals from diverse linguistic and cultural backgrounds, and despite its superficial resemblance to English, it possesses numerous distinguishing characteristics that deviate from the norms of conventional English. Therefore, NNESs must be aware of the fundamental qualities and characteristics of NNE when conversing with NNESs to ensure successful communication and avoid alienation and marginalization.

Japanese businesspeople often struggle with English communication, despite their efforts to study English. Despite efforts to improve their English competence, many Japanese businesspeople still struggle with communication due to limited opportunities. To improve their communication, they need to learn NNES communicative competence, which extends beyond lexicogrammar and abstract pragmatic norms. Cultural differences should not be viewed as inherent traits but as a result of ongoing interactions and negotiations. Learning specific behaviors, such as Hofstede's Cultural Dimensions Framework, is less effective when interacting with NNESs from diverse cultures. Both NNES and NESs should actively participate in real-world interactions to enhance communication skills in multicultural and multilingual work environments. A monolingual-myopic mindset in Japan can lead management to believe that everything must be in English, forcing NNESs to exert unnecessary effort and discourage them from using English. Language is a living thing that changes greatly depending on the values, culture, and lifestyle of the people who use it.

English as the Corporate Official Language: What is the Prerequisite?

A study of a Japanese company that implemented English as the official language (Ujiie, 2020) suggested that the majority of the company's employees did not need English for their daily work, which hindered the full implementation of the English official language policy. The company should have focused on diversifying its workforce by recruiting talent from many ethnicities, cultures, and languages before making English the official language. Instead, the company prioritized mandating the use of "English" without considering its relevance to employees.

The study suggested that the lack of employee diversity was the main reason for the ineffectiveness of the language policy. At the time, the company's Japanese staff did not see the need to use English, and there was little motivation to use the language without a compelling purpose.

I suggest the following solutions: The proposed remedies include (1) raise awareness of the distinction between NNE and ENL among NNES and NES personnel; (2) taking advantage of foreign training possibilities; (3) bringing more international staff members from the company's overseas offices; and (4) recruiting more employees from abroad to promote language and cultural diversity in the workplace.

5. Reference

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MS0115: Stay or Leave: Nationalist Movement Against Foreign Subsidiaries' Parent Country and Local Managers' Exits

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Stay or Leave: Nationalist Movement Against Foreign Subsidiaries' Parent Country and Local Managers' Exits

Abstract. We study how nationalist movements affect local managers' turnovers. Drawing on social identity theory, we argue that nationalist movements against foreign subsidiaries' parent country trigger the conflict between local managers' foreign organizational identity and national identity and heighten the salience of their national identity, thereby prompting them to exit foreign firms in support of their national identity. The effect is attenuated with higher local ownership and longer manager tenure but is amplified with more sister subsidiaries experiencing the movement. We find support for these ideas by employ a DID-Cox-PH model to exploit the Chinese anti-Japan protests in 2012.

Keywords: nationalist movement, liability of foreignness, identity conflict, manager turnovers

INTRODUCTION

Nationalism is an increasingly important topic of inquiry in the international business field (Alvarez & Rangan, 2019; Luo, 2024; Rammal et al., 2022). Scholars have recently explored the impact of nationalism on firms' financial performance (Barwick, Li, Wallace, & Weiss, 2019; Pandya & Venkatesan, 2016) and responsive strategies based on the varying organizational theories (Ertug, Cuypers, Dow, & Edman, 2023; Yiu, Wan, Chen, & Tian, 2022) and how firms take advantage of the nationalism in their strategies (Edman, Cuypers, Ertug, & Aguilera, 2024; Lubinski & Wadhvani, 2020).

Even though we have accumulated much knowledge about the influence of nationalism at the organizational level, less attention has been paid to its influence on the identity-based liability of foreignness (LOF) for managers. Extant two lines of LOF literature have focused on the foreign-identity-triggered LOF for foreign-owned firms and foreign managers respectively (Bertrand, Betschinger, & Moschieri, 2021; Lu, Ma, & Xie, 2022; Thams & Rickley, 2023). Little is known about when and how LOF can spill over from foreign-owned firms to local managers. This lack of attention may not be surprising, as local managers in foreign subsidiaries may not suffer the LOF under the general globalization background because working for foreign firms is congruent with societal norms in the context of globalization (Goerzen, Asmussen, & Nielsen, 2024). However, this may not hold well with the rise of nationalism when the blind attachment to one's own country and derogation and hostility toward another country dominate the society (Mylonas & Tudor, 2021; Rajiman, Davidov, Schmidt, & Hochman, 2008). Therefore, it deserves our attention how nationalist movements shape identity-based liability spillover from foreign firms to local managers and affect their turnovers.

Building on social identity theory (Ashforth & Mael, 1989; Brewer, 2001; Withers, Corley, & Hillman, 2012), we argue that nationalist movements against foreign subsidiaries' parent country trigger the conflict between local managers' national identity and foreign identity and increase the salience of their national identity, thereby prompting these local managers to exit from foreign firms as a response to mitigate the identity conflict. The impact of nationalist movement on local managers' exit is weakened when the strength of identity conflict decreases with higher local ownership in foreign subsidiaries and when the subjective importance of foreign identity increases with longer manager tenure in foreign subsidiaries, but it is strengthened when the situational relevance rises with more peer subsidiaries experiencing the movement.

To examine these propositions, we exploit the Chinese anti-Japan movement in 2012 out of the Diaoyu/Senkaku Islands issue as the research context. We employ a difference-in-differences design in the survival analysis framework to examine the turnover likelihood of 1055 Chinese managers in 915 Japanese subsidiaries from 2008 to 2014. We found strong support for our propositions. This study contributes to the literature on nationalist movements, liability of foreignness, and international corporate governance.

THEORY AND HYPOTHESES

Nationalist Movement and Local Manager Exits

Local managers in foreign subsidiaries typically possess dual identities that come into conflict during the nationalist movement. On the one hand, they hold a distinct foreign organizational identity shaped by their membership in the foreign subsidiaries. On the other hand, they have a deeply ingrained local national identity, aligning themselves with the local-national social group based on their nationality (Lee, Kim, &

You, 2023). As managers of foreign firms, they have a fiduciary duty to act in the best interest of the foreign owners (Thams & Rickley, 2023). As local nationals, the societal norms that strongly shape their behaviors differ significantly in the context of globalization versus nationalist movement. Under the general globalization background, where openness to foreign culture and businesses is the societal norm (Goerzen et al., 2024), local managers do not experience the conflict between serving foreign firms and adhering to societal expectations. However, during nationalist movements against foreign subsidiaries' parent country, where the societal norm shifts into the animosity against the target country and relevant entities (Brewer, 1999; Gries, Steiger, & Wang, 2016), local managers may find their fiduciary duties at odds with the societal norm and could even be perceived as unpatriotic or traitorous (Tian et al., 2021).

In the meanwhile, the nationalist movement will heighten the salience of national identity by increasing its subjective importance and invoking its situational relevance. Regarding the subjective importance that is defined by an identity's internal preference (Ashforth & Johnson, 2001), national identity *per se* is rather important because it "provides a powerful means of defining and locating individual selves in the world" (Smith, 2013: 17). Given that the nationalist movement will shape the internal preference by promoting the blind love for one's own nation, it will increase the subjective importance of national identity (Davidov, 2009; Huddy & Khatib, 2007). The situational relevance of an identity, on the other hand, is influenced by its comparative fit, which refers to the extent to which the within-group differences are smaller than the between-group differences (Haslam & Naomi, 2005). As the nationalist movement will amplify the between-nation differences by promoting the animosity against the target nation, it will heighten the situational relevance of national identity and make the faultline between the two nations more evident. In sum, the nationalist movement will improve the salience of the national identity by enhancing its subjective importance and promoting its situational relevance.

The more salient the social identity, the more likely one's behaviors are to align in support of that identity because the social group where the identity is derived will be seen as an extension of self (Withers et al., 2012). As the nationalist movement triggers the conflict between local managers' foreign organizational identity and national identity and enhances the salience of national identity, local managers in cities experiencing the nationalist movement are more inclined to exit the foreign firms in support of the national identity than those in cities not experiencing the movement. Thus, we hypothesize that:

H1: Local managers in cities experiencing the nationalist movement against foreign subsidiaries' parent country are more likely to exit the foreign subsidiaries than those in cities not experiencing the movement.

Moderation Effect of Local Ownership

The perceived foreignness of an organizational identity is largely influenced by its ownership structure (Cannella, Jones, & Withers, 2015). With more local ownership in the foreign subsidiary, the firm will be seen as less foreign, meaning that the local managers are serving the best interest of not only foreign owners from the target country but also local owners. Thus, their fiduciary duty as local managers will be less incompatible with the societal norm among local nationals during the nationalist movement.

Therefore, among local managers in cities where nationalist movement happens, those in foreign subsidiaries with more local ownership will confront less identity conflict and thus be less likely to exit the foreign subsidiaries than those in foreign firms with less local ownership. Thus, we hypothesize that:

H2: The positive relationship between the nationalist movement and local manager turnovers will be weakened if the foreign subsidiaries have more local ownership.

Moderation Effect of Local Managers' Tenure

Extended tenure provides ample opportunities for local managers to integrate into the organizational fabric, develop meaningful relationships with colleagues, and gain a deep understanding of the company's culture, values, and operations (Bullis & Bach, 1989). As they spend more time in the foreign firm, they may have more internal preference of the organization and thus consider the foreign organizational identity more important (Ashforth, Harrison, & Corley, 2008; Ashforth & Mael, 1989). Therefore, given the same increase in national identity's subjective importance among local managers in cities experiencing the nationalist movement, those assigning more importance to the foreign organizational identity are less inclined to exit the foreign firms to support the national identity than those considering the foreign

organizational identity less important. Thus, we hypothesize that:

H3: The positive relationship between the nationalist movement and local manager turnovers will be weakened if the local managers have longer tenure in the foreign subsidiaries.

Moderation Effect of Sister Subsidiaries Experiencing the Movement

As subsidiaries under control of the same parent firm, sister subsidiaries hold a cohesive network with shared information, resources, and management (Ghoshal & Bartlett, 1990; Kim, Lu, & Rhee, 2012; Meyer, Li, & Schotter, 2020). With more sister subsidiaries experiencing the movement, local managers' perceived movement strength will be stronger, rendering the between-nation differences and faultline more evident. As an identity's situational relevance is influenced by the extent to which the between-group differences outweigh the within-group difference and is reflected in the prominence of the between-group faultline in a situation, the sister subsidiaries experiencing the movement will increase the situational relevance of the national identity. Adding that local managers' foreign organizational identity is in conflict with their national identity during the nationalist movement, those with more sister subsidiaries experiencing the movement are more likely to exit the foreign firms to support their national identity than those with fewer such sister subsidiaries. Thus, we hypothesize that:

H4: The positive relationship between the nationalist movement and local manager turnovers will be strengthened if more sister subsidiaries experience the movement.

METHODS

Research Context and Data Sample

In this study, we used the anti-Japan nationalist movement in 2012 in China out of the Diaoyu/Senkaku Islands issue as the quasi-experimental research context to examine its influence on Chinese managers turnovers in Japanese-owned subsidiaries.

We restrict our analysis from 2008 to 2014. The sample period starts from 2008 to exclude the contaminating effect from another small-scale anti-Japan movement in 2005. The ending period is chosen because the leaders of the Chinese and Japanese governments had a meeting at the end of 2014, indicating the recovery of the bilateral relationship. As we implement the survival analysis to examine the local manager turnovers in response to the nationalist movement, we obtained 915 Japanese subsidiaries with 1055 local general managers composing of 3448 observations, who started their recent tenures in the sample period to avoid the left-truncation issue.

DID approach in survival analysis framework.

As the outcome of interest is the turnovers of local general managers in foreign subsidiaries, we choose Cox proportional hazard (PH) model (Agarwal, Sing, Song, & Zhang, 2024). But prior research based on the survival analysis might suffer the endogeneity issue due to the fact that the variations of underpinning mechanisms are not completely exogenous. To resolve this issue, we use an exogenous shock (nationalist movement) to obtain the exogenous variations in the identity conflict and salience and apply difference-in-differences (DID) approach in the survival analysis framework to infer the causal relationship between nationalist movement and local manager turnovers.

Measures

Dependent variable. *Local manager exit* receives the value of one in the year when the local general manager departs from the foreign subsidiary and zero otherwise.

Independent variable. *Treated* receives the value of one if the local general manager is in a subsidiary in the city where the anti-Japan nationalist movement occurred and 0 otherwise. *Post* is coded as one if the year is in the post period (2012-2014) and zero otherwise. *DID* is the interaction term between *treated* and *post*. The locations of the anti-Japan nationalist movement, as identified by Tian, Tse, Xiang, Li, and Pan (2021), are based on data collected from reputable Chinese and foreign media sources, including Baidu, Tiexuewang, and Xinhua, CNN, BBC, VOA, the Associated Press, NPR, Reuters, and Wikipedia. The validity of this location list has been confirmed.¹

¹ Protest cities: Anqing Beijing Changsha Changzhi Changzhou Chengdu Chongqing Dongguan Dongying Fuzhou Guangzhou Guiyang Harbin Hangzhou Hefei Jincheng Jinzhou Kunming Lanzhou Luoyang Nanchang Nanjing Nanning Pingxiang Qingdao Qijing Shanghai Shaoguan Shenyang Shenzhen Shiyuan Suzhou Taiyuan Taizhou Tangshan Tianjin Wenzhou Wuhan Xian Xuzhou

Moderators. *Local ownership* represents the share of Chinese equity in the Japanese subsidiaries in China. *Manager tenure* is measured as the number of years a local general has been in the general manager position before his or her recent tenure. This measure is log-transformed because the raw values are highly skewed. *Ratio of sister subsidiaries experiencing movement* is measured as the ratio of sister subsidiaries experiencing the movement to the total number of sister subsidiaries in a given year.

Control variables. We controlled the factors influencing manager exits at parent firm, subsidiary, manager, industry, and district levels.

RESULTS

Table 1 is the descriptive statistics and correlation matrix for the full sample, and we found a significantly positive correlation between *DID* and *local manager exit*, which provides the preliminary support for the predicted positive relationship between nationalist movement and local managers' exits. To check for potential multicollinearity issues, we calculated variance inflation factor (VIF) scores for all the independent, moderator, and control variables. The largest individual VIF value was 2.23, well below the recommended value of 10. The average VIF value was less than 1.23, much lower than the threshold of 5. Thus, multicollinearity is not a concern in this research.

[Insert Table 1 about here]

As we constructed the DID design, the parallel-trend assumption is examined and satisfied before further analysis. We reported the hazard coefficients in the result tables. The positive coefficients indicate the increase in the hazard rate, and the negative ones mean the decrease in the hazard rate.

Table 2 presents the results of the impact of the anti-Japanese nationalist movement on local general managers' exits and the three moderation effects. Model 1 is the baseline model with only control and moderator variables as the covariates. Model 2 displays the statistical results of H1. The coefficient of *DID* is positively significant ($\beta=0.935$, hazard ratio= 2.547^2 , $p<0.001$), indicating that local general managers' exit rate after the nationalist movement increases by 155 percent³ relative to that of comparable local managers in the control group. Thus, we find statistical support for the positive impact of the nationalist movement on local managers' exits. Model 3 shows the moderation effect of *local ownership*. The coefficient of the interaction term between *DID* and *local ownership* is negatively significant ($\beta=-1.543$, $p=0.003$). The result shows that a rise in local ownership in the Japanese subsidiaries weakens the positive relationship between the nationalist movement and local managers' exits, thereby providing support for H2. Model 4 presents the moderation effect of *manager's tenure*. The coefficient of the interaction term between *DID* and *manager's tenure* is negatively significant ($\beta=-0.479$, $p<0.001$) providing support for H3: the positive relationship between the nationalist movement and local manager turnovers will be weakened if the local managers have longer tenure in the foreign subsidiaries. Model 5 is about the moderation effect of the *ratio of sister subsidiaries experiencing the movement*. In support of H4, the coefficient of the interaction term between *DID* and *ratio of sister subsidiaries experiencing the movement* is positively significant ($\beta=1.136$, $p=0.067$), indicating that the higher the ratio of sister subsidiaries experiencing the movement, the higher the probability of local managers' exits after the nationalist movement. Model 6 is the full model, including all the variables, where the result of each hypothesis is consistent. Our results are robust after a battery of robustness tests. Given the space limit, please see the online appendix for the detailed results.

[Insert Table 2 about here]

Discussion

We make three contributions. First, we contribute to the LOF literature by identifying when and how LOF can spill over from organizations into individuals. We move away from conceptualizing LOF as a negative outcome of the given identity of foreign firms or foreign-born managers to conceptualize LOF as a spillover into the local managers working in foreign firms. This work represents an important theoretical shift from a single-identity perspective to a dual-identity perspective, thus broadening the remit of the

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² $(\exp(0.935))*100$

³ $(\exp(0.935)-1)*100$

LOF literature. Second, we advance the literature on nationalism by illuminating the adverse outcomes of nationalist movements incurred by members of one's own nation. Prior research has focused on the adverse outcomes of nationalism experienced by the members and business entities of the other nations (Barwick et al., 2019; Feinstein & Bonikowski, 2021; Heilmann, 2016). However, extant research does not address whether and how members of one's own nation may suffer from the nationalist movement. We fill the gap by showing that local managers in foreign firms will incur LOF during the nationalist movement against foreign firms' parent country because of their foreign organizational identity. This study shifts our attention from the other nations to one's own nation and thus enriches the literature on nationalism. Finally, we contribute to research on manager turnovers in the international business field by highlighting the role of local managers' dual identities in their stay-or-leave decisions. Scholars have explored local manager turnovers by focusing on organizational and individual factors (Peltokorpi & Presbitero, 2024; Yang & Pak, 2022). In contrast, we exploit the influence of a critical environmental factor, nationalism movement. We highlight the identity conflict between local managers' national identity and foreign identity and conceptualize the LOF spillover from foreign firms to local managers, which promotes local managers' exit likelihood. This study introduces a new angle to study the manager turnovers in the international business field.

Note. Please see the online appendix for the detailed results: [Online results.xlsx](#).

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MS0117: The Fox Preys Farthest from His Hole: How Innovation Decoupling Attracts Foreign Investors in China

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The Fox Preys Farthest from His Hole: How Innovation Decoupling Attracts Foreign

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This study examines innovation decoupling, where firms emphasize symbolic innovation disclosures over substantive actions, and its role in attracting foreign institutional investors. Drawing on signaling theory, we hypothesize that foreign investors, compared to local ones, are more responsive to innovation decoupling due to reduced perceived information asymmetry. Analyzing Chinese listed firms' disclosures from 2018–2022 using machine learning, we find that internationalization enhances this effect, whereas higher institutional transparency weakens it. This research contributes to understanding the interplay between symbolic and substantive innovation, foreign investor preferences, and provides a methodological framework for studying innovation decoupling.

Keyword: Innovation decoupling, foreign ownership, internationalization, institutional transparency, machine learning

Innovation is a critical factor in attracting investment, as it demonstrates a firm's potential for long-term economic growth and sustaining core competitiveness (Cohen & Levinthal, 1989; Dahlquist & Robertsson, 2001; Cassiman & Golovko, 2011). However, engaging in innovation is inherently high-risk and requires substantial financial resources (Brown, Fazzari, & Petersen, 2009; Ferreira, Fernandes, & Ferreira, 2019). Firms often need to secure external investment to overcome funding challenges associated with their innovation activities. However, in the process of securing investment, firms encounter a cost disparity between different types of innovation efforts. Substantive innovation, which involves genuine research and development, entails high costs and considerable risk. In contrast, symbolic disclosure—such as publicizing innovation initiatives without substantial backing—are low-cost and often evade strict regulatory oversight (Liu, Zhou, & Li, 2023; Gong, Wang, Zhang, Gao, & Xie, 2023). Thus, similar to the well-documented decoupling in ESG and CSR reporting (Bothello, Ioannou, Porumb, & Zengin-Karaibrahimoglu, 2023; Marquis & Qian, 2014; Tashman, Marano, & Kostova, 2018), firms may perform decoupling behavior in innovation to respond to stakeholders' demands, particularly investors.

Yet, information asymmetry exists between firms and investors, making it difficult for investors to fully understand the specifics of a firm's innovation efforts (Aboody & Lev, 2000, Jiang & Yuan, 2018). Compared to local investors, when assessing firm innovation capabilities, foreign investors may face obstacles in obtaining crucial information (Bell, Filatotchev, & Rasheed, 2012) and be unable to accurately assess the true level and potential of a firm's innovation (Baik, Kang, Kim, & Lee, 2013). This discrepancy can lead to different behaviors between foreign and local investors in their investment decisions. Thus, this paper aims to explore how innovation decoupling impacts different investors, particularly foreign investors.

“Decoupling” is defined as symbolically responding to stakeholder demands without enacting substantive changes (Marquis & Qian, 2014). By integrating the dimensions of symbolic disclosure and substantive change in innovation, we propose the term “innovation decoupling” to capture the disparity

between these two elements. This concept refers to the tendency to prioritize symbolic disclosure of innovation over the implementation of substantive changes, thereby underscoring the critical distinction between form and substance in organizational innovation activities. This research aims to investigate whether and how innovation decoupling affects the results of securing investment.

Drawing from the signaling theory perspective (Connelly, Certo, Ireland, & Reutzel, 2011), where signaling is fundamentally concerned with reducing information asymmetry between parties (Spence, 2002), we propose that the higher the level of innovation decoupling by firms, the higher the proportion of foreign institutional ownership compared to local investor ownership (see Figure 1). Our basic logic is that, despite the actual innovation activities not meeting the proclaimed levels, more frequent disclosures of innovation can reduce information asymmetry and allow companies to successfully convince foreign investors of their innovative capabilities (Dahlquist & Robertsson, 2001; Witt, 2019). Furthermore, because the signaling cost of innovation disclosure is low, firms may maintain this cutting-edge market image through low-cost promotion, releasing a false signal that attracts and retains the support and investment of foreign investors (Di Domenico, Sit, Ishizaka, & Nunan, 2021). Moreover, compared to local investors, foreign investors often lack the capacity to effectively assess a firm's actual innovative capabilities, which further reduces the costs associated with the illegitimacy of innovation decoupling signals. This fabricated image leads foreign investors to subconsciously accept the firm's value and aligns with their expectations of growth potential. Additionally, we find that when firms establish more subsidiaries abroad, indicating a higher degree of internationalization, the signals of innovation decoupling can be further disseminated, thereby enhancing the firm's appeal to foreign investors (Covrig, Lau, & Ng, 2006). However, this appeal is weakened in regions with higher institutional transparency, as the costs associated with the false signals of decoupling are elevated, and foreign investors can effectively obtain accurate information about the firm through alternative means (Du & Zhao, 2023).

Our study specifically focuses on the Chinese context, chosen for its dynamic corporate landscape and its important role for entrepreneurship (Armanios, Eesley, Li, & Eisenhardt, 2017), a context that

provides substantial inter-organizational variations to attest to our hypotheses., making it an exemplary research setting (Chen, Han, Li, Megginson, & Zhang, 2022). Furthermore, following China's accession to the WTO, the Chinese government implemented a series of proactive policies that have significantly attracted foreign investors (Yiu, Wan, Chen, & Tian, 2021; Zhang, 2022). Our sample comprises the most recent five years of data (2018-2022) on Chinese listed companies, sourced from the CSMAR and CNRDS databases. To measure 'overstating innovation', we employed a machine learning (ML) approach to evaluate symbolic innovation within enterprises (Choi, Menon, & Tabakovic, 2021; Bellstam, Bhagat, & Cookson, 2021). This method involved constructing indicators of symbolic innovation by utilizing ML algorithms to analyze and summarize innovation-related vocabulary and themes within annual reports. For substantive innovation, we quantified the number of patents filed by companies annually (see Figure 2). Our empirical results provide robust support for our three hypotheses.

Overall, this study contributes to the literature on three fronts. First, by exploring the uncharted territory of innovation, our research elucidates the dynamics of inconsistencies between symbolic innovation intentions and their practical implementation within firms (Marquis & Qian, 2014). This exploration adds a critical layer of understanding to the preferences of foreign investors (Dahlquist & Robertsson, 2001). Moreover, we enrich the signaling literature by emphasizing that strategic signaling can be a critical tool for firms to convey their underlying quality, thus reducing information asymmetry and attracting investors (Spence, 2002; Connelly et al., 2010). Secondly, by demonstrating that the degree of internationalization and the institutional transparency, we emphasize the role of signal characteristics in shaping investor perceptions and decision-making processes within the context of asymmetric information (Covrig, Lau, & Ng, 2006; Du & Zhao, 2023). Third, the methodological approach employed in this study, including the application of machine learning techniques to assess symbolic innovation and the utilization of comprehensive datasets from CSMAR, offers a template for future research in analyzing overstating innovation and related phenomena in other corporate contexts. The innovative use of textual analysis and quantitative metrics enhances the precision and depth of our analysis.

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Appendix

Table 1 Descriptive statistics

Variables	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Foreign ownership / Local	0.020	0.123	1.000																
Innovation decoupling	1.747	0.910	0.048***	1.000															
Transparency pressure	0.000	1.000	0.003	-0.008	1.000														
Internationalization	0.567	0.835	0.057***	-0.039***	0.022***	1.000													
Firm age	3.007	0.290	-0.080***	-0.175***	-0.017**	-0.006	1.000												
Firm size	22.22	1.328	-0.044***	-0.308***	0.086***	0.344***	0.178***	1.000											
Return on assets	0.034	0.082	0.049***	-0.038***	0.113***	0.011	-0.083***	0.023***	1.000										
Leverage	0.411	0.206	-0.064***	-0.133***	-0.035***	0.151***	0.181***	0.458***	-0.373***	1.000									
Asset growth rate	0.158	0.406	0.035***	0.005	0.021***	0.037***	-0.070***	0.048***	0.262***	0.020***	1.000								
Board size	2.179	0.243	-0.013*	-0.135***	0.025***	0.018***	0.118***	0.242***	-0.039***	0.143***	0.007	1.000							
Male ratio	0.833	0.133	-0.021***	-0.026***	0.008	0.045***	0.011*	0.150***	-0.018***	0.089***	0.001	0.077***	1.000						
Advertise intensity	0.019	0.297	0.008	-0.042***	-0.005	0.006	-0.013*	-0.013**	-0.018***	-0.032***	0.037***	-0.001	-0.008	1.000					
Auditor choice	0.062	0.241	0.085***	-0.117***	0.013**	0.158***	0.013*	0.312***	0.030***	0.078***	0.006	0.069***	0.057***	0.007	1.000				
HHI	0.132	0.138	-0.023***	-0.059***	-0.003	0.001	0.017**	0.066***	-0.066***	0.071***	-0.020***	0.034***	0.003	-0.024***	0.051***	1.000			
Education expenditure	0.044	0.034	-0.034***	0.009	-0.048***	-0.028***	0.027***	0.037***	-0.020***	0.042***	-0.013*	0.031***	0.006	0.000	-0.015**	0.048***	1.000		
Average wage	0.116	0.039	0.012*	0.104***	0.049***	0.077***	-0.001	0.051***	-0.023***	-0.038***	-0.048***	-0.048***	-0.054***	0.003	0.125***	0.032***	0.108***	1.000	
Foreign direct investment	0.024	0.016	0.009	0.034***	0.012*	0.007	-0.072***	0.010	0.027***	-0.021***	0.009	-0.009	-0.009	0.000	0.049***	0.005	0.224***	0.194***	1.000

Table 2 Regression results

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Innovation decoupling		0.010*** (0.001)	0.010*** (0.001)	0.009*** (0.001)	0.009*** (0.001)
Transparency pressure			-0.001 (0.001)		-0.001 (0.001)
Internationalization				0.009*** (0.001)	0.009*** (0.001)
Innovation decoupling × Transparency pressure			-0.004*** (0.001)		-0.004*** (0.001)
Innovation decoupling × Internationalization				0.003** (0.001)	0.003** (0.001)
Constant	0.180*** (0.022)	0.112*** (0.024)	0.114*** (0.024)	0.156*** (0.024)	0.158*** (0.025)
Industry	Control	Control	Control	Control	Control
Year	Control	Control	Control	Control	Control
Observations	15477	15477	15434	15477	15434
R ²	0.016	0.020	0.020	0.023	0.024

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 1 Conceptual model

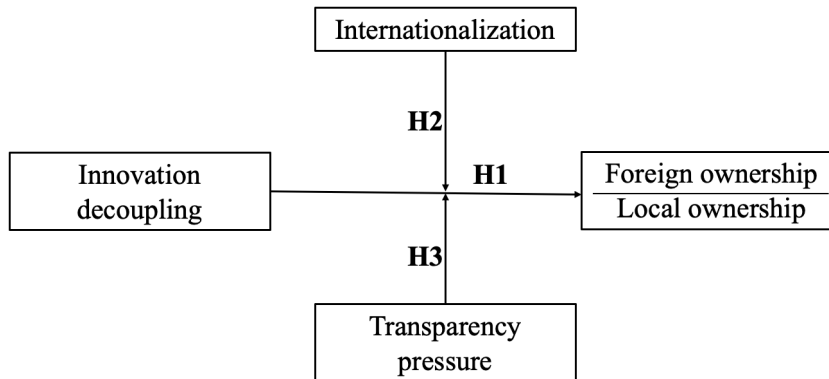
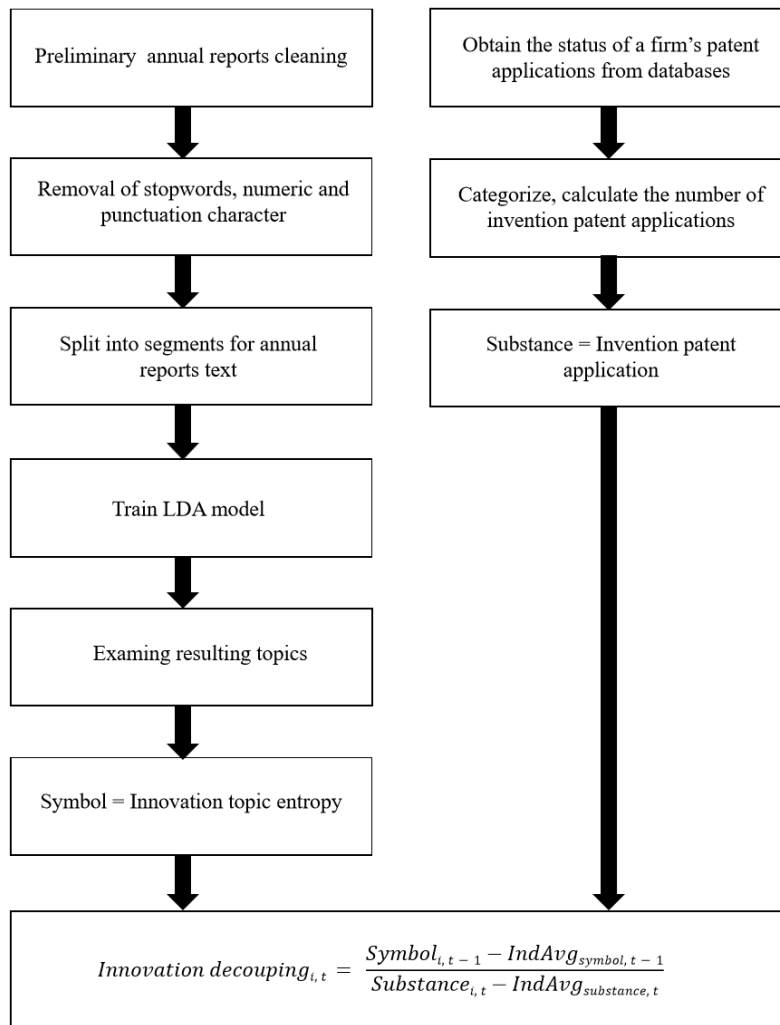


Figure 2 Innovation decoupling construction flowchart





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MS0120: The Strategic Importance of Geopolitical Risks for MNEs: Navigating Uncertainty in a Globalized World

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The Strategic Importance of Geopolitical Risks for MNEs: Navigating Uncertainty in a Globalized World

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Extended Abstract

One of the prominent areas of research in international business has been geopolitical risk. The issues primarily revolve around identifying, analyzing, examining, managing, and mitigating geopolitical risks. These risks are crucial for multinational enterprises (MNEs) to build their capabilities for legitimate decision-making. Although extant literature has highlighted the risks faced by these MNEs, the impact of geopolitical risk in the host countries remains scarce. Highlighting the significance of geopolitical risk for businesses, we identify ten risk factors and outline their severity based on the geopolitical risk index. Our study proposes a conceptual framework showcasing how geopolitical risk can be assessed.

Keywords: *Geopolitical risks, MNEs, strategies, mitigation*

1. Introduction

The world is grappling with a significant and passive transition in the prevailing global environment. This transition has been pushed by significant events, including the nations' economic disengagement, the emergence of new economic and political alliances, and global disruptions (KPMG, 2023).

Moreover, the increasing scope of the threats caused by geopolitical shifts to the activities and the

survival of Multinational Enterprises (MNEs) continue to imperil the efficacy of their subsidiaries operating in conflict-prone countries (Lee and Chung, 2022). The literature has enumerated several factors that showcase the importance of geopolitical risk for MNEs. These factors include investment strategies (Han, 2021); FDI Flow and internationalisation of the firms (Han, Liu, Gao and Ghuri, 2018); supply chain reconfigurations (Roscoe, Aktas, Peterson, Skipworth, Handfield, Habib, 2022); Political Uncertainty (Han, 2021); Resilience (Ramamurti and Hillemann, 2018); Legitimacy (Han, 2021; Han, Liu, Gao and Ghuri, 2014; Lu, Liu, Wright and Filatochev, 2014); competitive advantage (Child and Marinova, 2014). There is a need to assess why geopolitical risks have been a cause of significant concern for the MNEs and what level of analysis is required to understand their nature.

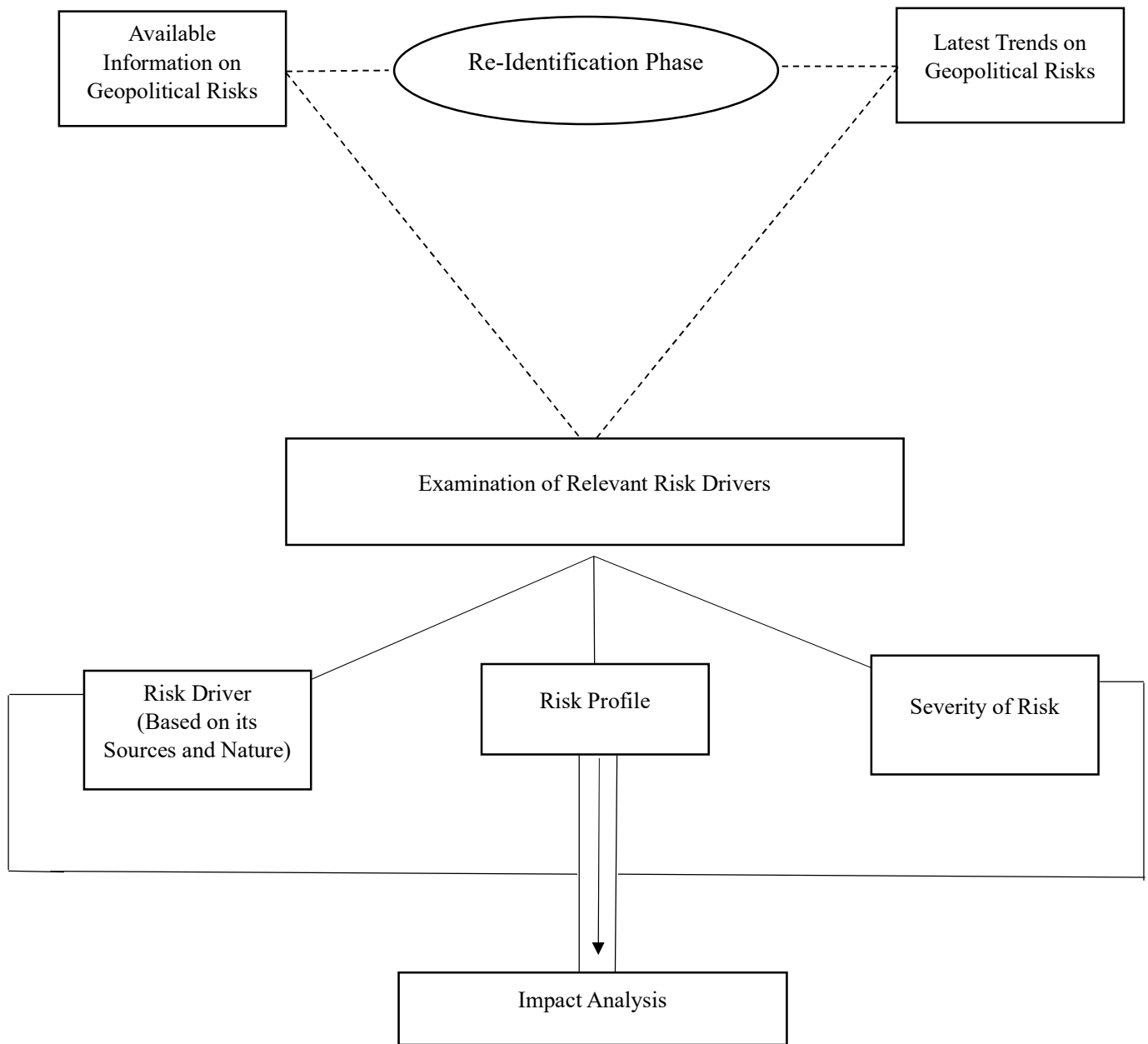
Given this backdrop, our study identifies ten major factors through extant literature that constitute the major form of geopolitical risk in the global world. These factors include US-China strategic competition, global technology decoupling, Russia-NATO conflict, gulf tensions, terror attacks, cyber-attacks, political crisis, climate change, European Fragmentation, and anti/de-globalization. Our study aims to answer the following research question: (a) Why are geopolitical risks strategically important for the MNEs? (b) How can geopolitical risk be managed and mitigated? To address our research questions, we propose a conceptual framework that eventually helps managers decipher core strategies for their businesses.

2. Literature Review

Geopolitical risks for the 21st century are crucial for businesses as these risks are caused by events that arise from different sources, such as war, sanctions on disagreements between the heads of the state and hostile country tensions (Caldara and Iacoviello, 2022). The existing strand of the literature asserts that there is a challenge through which geopolitical risk can be isolated from the facets of general economic and political uncertainty. Existing studies have contended that events such as war, military conflicts, seizures and sanctions are the worst for investors (Cao, Li and Liu, 2023). It may be interesting to note that as the occurrence and significance of geopolitical conflicts continue to escalate worldwide, MNEs use specific mechanisms to alter their perceptions of investment (Moyo,

2019; Witt, 2019). Li, Tong, Zhong, Xu, and Zhao (2024) have asserted in their study that the impact of geopolitical risk in host countries on the performance of MNEs remains unexplored. MNEs are typically unaware of managing their investments against geopolitical risks. Resolving this kind of risk requires specific mechanisms and practical strategies to sustain in the long run.

Fig 1: Proposed Conceptual Framework



3. Methodology

In the context of our study, we have conducted in-depth qualitative interviews with a panel of experts. The experts were selected based on their profile and their expertise in geopolitics. The panel for the same includes academicians, policy experts and practitioners as the experts. The interviews were conducted based on the questionnaire adopted from the Index (Caldara and Iacoviello, 2022). The levels of analysis included in the index were supranational, international, national, industry, and firm. Examining geopolitical risk from all levels is imperative to understand its impact on business operations. The experts were also asked to rate the level of risk that each factor can have between 0 and 100. The risk score between 0-20 indicated very low risk, 21-40 low risk, 41-60 moderate risk, 61-80 high risk and 81-100 indicated very high risk.

4. Findings

The study's findings revealed that critical geopolitical risk factors at the supranational level can disrupt the operations of the MNEs in the host country. The experts in the interview also revealed that the supranational organisations' role is to mediate and resolve political tensions between the countries, as this tends to affect the likelihood of geopolitical risk. The experts also felt that it is essential to critically assess the country's political relations amid the global contestations in augmenting or devising strategies to mitigate the effect of geopolitical tension on the MNEs. Therefore, the countries need to be hostile towards each other so that effective strategies can be formulated in order to mitigate geopolitical risk. The findings further revealed that the ongoing terror attacks and cyber-attacks at the national level can be addressed by monitoring the issues prevailing at the macro level. At the industry level, the

experts suggested that examining how these contestations affect the supply chains of MNEs is essential. At the firm level, findings revealed that the efficacy of the risk would be different for both the developed and the developing markets. In this sense, the experts also suggested that the political capabilities of the MNEs depend on the market they come from.

5. Discussion and Conclusion

We have conducted a detailed analysis to understand the significance of geopolitical risk and how these risks can be mitigated. A multidimensional approach must be taken to address and examine this kind of risk. The top managerial level should apply a multi-level approach in assessing geopolitical risks. This will also enable them to address each strategic challenge at the core of their capabilities. It is imperative to understand that as MNEs improve their efficiency and capabilities, they can advance their strategy regarding investment decisions, legitimate decision-making, and the mechanisms that enable these MNEs to achieve competitive advantage. Thus, our study will pave potential avenues for future researchers. Practitioners and policy researchers can use this study to design effective strategies for MNEs operating in fragile and transition economies to assess and mitigate geopolitical risk.

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MS0121: Agroentrepreneurship in A Divided Context: Case Studies in Sarawak, Malaysia

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**AGROENTREPRENEURSHIP IN A DIVIDED CONTEXT: CASE
STUDIES IN SARAWAK, MALAYSIA**

ABSTRACT

This study explores the role of spatial embeddedness in a divided context, using the background of agroentrepreneurs in Sarawak, Malaysia. This research is outlined by the concepts of embeddedness in entrepreneurial opportunity development, in understanding the way agroentrepreneurs navigate a business environment that is characterized by structural, income and infrastructural divide – which are conventional features of many emerging markets. We adopt an abductive qualitative design using a case study approach, to which the findings revealed four strategies in navigating a structurally divided environment. Theory-wise, our study speaks to the discourse on emerging markets by highlighting the contingent effect of infrastructure imbalance. Practise-wise, the classification of strategies highlighted resulting from the findings are useful for entrepreneurs considering opportunities in emerging markets.

Keywords: Embeddedness, emerging markets, agroentrepreneurship

Emerging markets continue to be a major focus due to their rapid economic growth and increasing influence on the global economy, shown in their contributions to global GDP and the shifts in economic power from developed to emerging economies (Morris, Aguilera, Fisher, & Thatcher, 2023). A significant body of research examines the institutional environments of emerging markets, including regulatory frameworks, corruption, and the effectiveness of legal systems. These factors impact foreign direct investment (FDI), business operations and the global supply chain (Cuervo-Cazurra & Pananond, 2023); to which it is worthwhile to study the granular dynamics of business activities conducted in an emerging market.

This research grapples with the question of: “What is the role of spatial embeddedness in the opportunity development process?” The intended contributions of this study are twofold – for theory, this research unravels the links between actors, resources and opportunities as entrepreneurship activities are embedded within its context (Birkholz, 2024); for policy and practice, this study’s findings can be referred to shape entrepreneurship policies aiming at regional economic development.

In an attempt to examine the complexity of business activities in an emerging market, this research focuses on agroentrepreneurs in Sarawak, Malaysia using an embeddedness perspective. Agribusiness provides a particularly rich context for studying spatial embeddedness and entrepreneurship as the context highlights the inextricable link of local environments, networks, and resource availability. A shaping factor of the opportunity process is resource availability (Eckhardt & Shane, 2003; Müller, Kirst, Bergmann, & Bird, 2023), thus agribusinesses are suitable context to study embeddedness, as the activities in agribusiness are inherently tied to specific geographical areas due to their reliance on local natural resources, such as soil quality, climate, and water availability (Leitão, Paiva, & Thomé, 2024). Further, agribusiness

opportunities and processes are influenced by the local networks, as they provide entrepreneurs with market, labor, and knowledge – agribusiness successes mainly depends on the strength and depth of their local connections and collaborative arrangements (Adobor, 2020). It is also important to note that agribusinesses are affected by local agricultural policies, subsidies, and regulations, which can vary significantly from one region to another. Understanding how these institutional factors shape entrepreneurial behavior and business success in different locales is crucial (Pemsl et al., 2022).

This research is structured as follows. This paper opens with a clarification on the main concepts outlining the study. This is followed by an explanation of this study's contextual background, then an explanation of the data collection and analysis approach. Then, we present the findings and further articulate them in the discussion section. This paper is concluded with the theoretical and practical implications of the research.

LITERATURE REVIEW

The discourse in embeddedness in entrepreneurship has largely focused on network and social embeddedness (Wigren-Kristoferson, Brundin, Hellerstedt, Stevenson, & Aggestam, 2022), leaving a room to understand other aspects shaping economic action, such as spatial embeddedness. In this regard, we adopt a poststructuralist view of embeddedness (Hess, 2004), primarily focusing on spatial embeddedness and what it means for entrepreneurial actions. This study is outlined by the embeddedness framework (Granovetter, 1985; Jack & Anderson, 2002; Uzzi, 1997); referred to as the complexity and attachment extent of individuals to an environment (Jack & Anderson, 2002; Uzzi, 1997). According to the embeddedness framework economic actions are

produced within and through micro, meso and macro levels, encompassing the actor, environment, network and culture (Hess, 2004) (Birkholz, 2024). As embeddedness illustrate the view that entrepreneurship activities are not produced in a vacuum, it states the importance of taking into account context into valorising an entrepreneurial phenomenon, which includes politics, temporal and regional (Ben-Hafaïedh et al., 2024; Kim, Bansal, & Haugh, 2019). In the field of entrepreneurship, the embeddedness framework enables us to make sense of the way social and economic forces (including society and structure) encourage or hamper the entrepreneurial process (Karlsson & Dahlberg, 2003). As entrepreneurship is a result of the dynamics of the entrepreneur and the local context through the embeddedness process (Jack & Anderson, 2002; Ozdemir, Moran, Zhong, & Bliemel, 2016), this framework has been applied in studies exploring how entrepreneurs perceive and exploit opportunities within a specific setting. As examples, a study conducted on female entrepreneurs shows that they build their ventures around female-based clientele (Essers, Benschop, & Doorewaard, 2010), a research on entrepreneurship activities conducted by depleted communities in Ireland illustrate that entrepreneurs and the communities close to them are co-dependent on their ventures (McKeever, Jack, & Anderson, 2015), and a study on entrepreneurs dealing with poverty-stricken communities in Colombia show how formal and informal structures interact and counter produce entrepreneurial development (Granados, Rosli, & Gotsi, 2022). In this aspect, the findings of this study highlights the complexity shaped by embeddedness of space, society and networks of emerging markets as they play a crucial role in the landscape of international business and entrepreneurship as an avenue for investment from large and small companies (Morris et al., 2023).

These studies demonstrate the way entrepreneurship activities are contextually bound in the physical and non-physical realm, yet spatial embeddedness has yet to be discussed at length due to the heavy emphasis on social and network embeddedness in the extant discourse (Wigren-Kristoferson et al., 2022)¹. especially in region-based entrepreneurship. As such entrepreneurs are highly embedded within their contexts for resources and entrepreneurial opportunities, this study further examine embeddedness in entrepreneurial activities, categorising them into three types of embeddedness; namely spatial, network and social embeddedness (Hess, 2004).

Spatial embeddedness

Space; in the form of place, region or state provide a warehouse-like centre whereby interpersonal, community and cultural bonding and exchanges take place (Hidalgo & Hernández, 2001; Raymond, Brown, & Weber, 2010). The context of space is referred to as the location whereby the entrepreneurial activity is conducted; shaped by its natural and geographical boundaries (as examples, bodies of water, topography) and locally-bound networks and meaning (Müller et al., 2023). We place heavier emphasis on spatial embeddedness as it provides a territory for formal and informal structures to form, thereby shaping the environment conducive or counterproductive for entrepreneurial action (Birkholz, 2024). It provides setting for the contingency of entrepreneurial actions (Yeung, 1998); offering a parameter for entrepreneurs with regards to resources, labour market conditions, raw materials and competition (Stefano, Zare, & Nicola, 2024). Specifically the experiential dimensions of entrepreneurial actions are bounded by defined territory, shaping the meanings, imagery and networks

¹ Understandable, as the role of relationships and networks have been consistently documented to be interactive (García-Lillo, Seva-Larrosa, & Sánchez-García, 2023)

that provide the structure to the space thus assisting the entrepreneur to coordinate their actions and resources in a strategic manner (Müller et al., 2023).

Spatial embeddedness, as a concept is based on the idea that an economic action stems from the decisionmaker's links with its locality. Specifically it focuses on the extent to which entrepreneurial actions take place and the venture's dependence on its immediate surroundings (Courtney, Lépiciér, & Schmitt, 2008; Kalantaridis & Bika, 2006). Spatially bounded entrepreneurial activities then evolve into sets of social relationships, as economic exchanges intertwine with social ties (Lähdesmäki, Siltaoja, & Spence, 2019; Uzzi, 1997).

Network embeddedness

Network relations in an abstract sense is placeless, yet ties that make up the network are usually formed in a boundary of space (Yeung, 1998). Network embeddedness is referred to as the connectivity of heterogeneous actors (Granovetter, 1983). It is conceptualised as the structure of relationships among a set of individuals and ventures regardless of their locality. Although network embeddedness may exist without a physical realm, for community-venture interactions to exist, some sort of physical spatial boundary is required (as examples, farms, warehouses and logistical offices will require land and physical space)(Hess, 2004). Further, networks that develop dynamically within a proximate space will induce trust between members, thus encourage in creation and development of entrepreneurial opportunities (Birkholz, 2024; De Clercq, Lim, & Oh, 2013). Through repeated interactions, individuals and ventures within the same place strengthen their bonds which then strengthens the network structure, which allow for information sharing and knowledge spillover (Malmberg & Maskell, 2006). This explains agglomeration phenomenon in Silicon Valley which made up of networks of tech companies (Saxenian, Motoyama, & Quan,

2002), the fashion cluster formed by immigrants in Prato, Italy (Ong & Freeman, 2017) and Chinese manufacturing start-up clusters (Cheng, Yuan, & Jiang, 2023).

Social embeddedness

Networks shape social context of a place, which then influences social embeddedness of individuals and ventures. Within the context of entrepreneurial action, cultural and social elements are able to be monetised (Hess, 2004). Social embeddedness refer to the historical context of the individuals, ventures and organisations within a specific locality and its cultural imprint; which shapes the entrepreneurial activity that are able to be conducted (Hess, 2004). It covers the cultural, historical and political background of the agent, which can be transferred across geographical boundaries. Social embeddedness explains the way returnee entrepreneurs start ventures in their home countries (Lin, Zheng, Lu, Liu, & Wright, 2019), entrepreneurial opportunities from former schools and universities (De Clercq et al., 2013) and sense of nostalgia in a community of small businesses (McKeever et al., 2015).

Spatial embeddedness as a parameter for entrepreneurial activities

For entrepreneurial actions, space is an important element as it provides a parameter for actions and decisions—for developing ties to social networks, for establishing practices into norms and for economic exchanges. The notion of space is increasingly crucial in the entrepreneurship discourse; as spatial context is instrumental in shaping the abstract and physical exchanges (Stefano et al., 2024) as the representations, meanings and emotional attachment to a specific place may influence the entrepreneurial process.

First, space serve as an axis supporting business activities; as value creation does not occur in a vaccum; belongingness to a locality and similarity with local actors

support the geographical proximity thus increase trust, assist in coordination and transaction costs (Hess, 2004; Kalantaridis & Bika, 2006). It also serves as an avenue for information exchanges. Frequent contacts and face-to-face interactions which are critical for information sharing and knowledge spillovers are further enabled if actors are embedded in a specific locality (Malmberg & Maskell, 2006; Stefano et al., 2024). Next, space enables a boundary to identify customers, suppliers and competitors; thereby shaping the competitive strategies of the firm (Müller et al., 2023). Further, familiarity with the immediate surroundings, which is encouraged by space embeddedness is associated with greater perceived self-efficacy, enhancing proactivity and risk-taking (Ren, Cheng, Hu, & Yin, 2021; Stefano et al., 2024).

Second, place boundary provides actors with parameters to identify resources that are available, and/or lacking. Resource coordination and mobilisation, in integration with available infrastructure and actors within a specific locality will guide a venture's operation and opportunity structure (Müller et al., 2023). In a space-based boundary, the entrepreneur may identify supporting and competing businesses within the same industry, identifying specialisation of a specific area in terms of raw materials, labour supply and distance to suppliers, which influences transaction costs (Parr, 2002; Stefano et al., 2024).

Third and most importantly, the territorial context provide entrepreneurs with a starting point for opportunity development. Through social exchanges and the network embeddedness that an entrepreneur has with the locality, the entrepreneur is able to access to critical or diverse information that flows through their strong and weak ties, respectively (Bennett & Chatterji, 2023; Granovetter, 1983). Being embedded with a place that has propensity for risk-taking, through the number of businesses in a specific

locality, will encourage an entrepreneur's risk-taking behaviour, thus encourage identification of opportunity and innovation (Birkholz, 2024).

Research focus

To this end, spatial embeddedness provides a boundary in the opportunity process.

What is yet to be understood is, how do entrepreneurs navigate spatial embeddedness in a vast and diverse setting? In this regard we conceptualise mechanisms for spatial embeddedness in opportunity development into three aspects, namely information exchanges, resource exchanges and opportunity identification.

METHODS

We employ a qualitative research approach outlined by abduction logic (Dubois & Gadde, 2002) in analysing and synthesising our findings, whereby the preliminary phase of this study is outlined by the views guiding this study, and further refined by the findings from our data. Such approach facilitates a theory-bounded and contextually relevant articulation for our research. This research adopts multiple case studies to obtain rich data on unexplored areas addressing the "how" and "why" questions (Edmondson & McManus, 2007). Specifically, the research was deductively shaped by the guiding literature in embeddedness perspective, then inductively contextualised by our data, rendering this research as literature and data-driven.

Agribusiness ventures in Sarawak, Malaysia is chosen as a background to investigate the way spatial embeddedness interlinks with the opportunity process. The sampling for our study is anchored by the following criteria:

- *Agropreneurs with ventures operating in Sarawak*

- *Agropreneurs in Sarawak that has been operating their ventures for more than five years*

These two criteria set the parameters in this research to eliminate ventures with different registration and operation locations. These inclusion criteria are crucial to ensure the validity of our findings. With regards to the on the contextual nature of the research, this study compares four agribusinesses articulated as “cases”, which we regard the units of analysis for this research, with individuals as the unit of observation, as recommended by Gerring (2004) and Long (2004).

Research Setting: Sarawak, Malaysia

Sarawak, Malaysia, provides a suitable background for studying spatial embeddedness in agribusiness entrepreneurship due to its diverse geographical, economic, and social characteristics; thereby illustrating the way contrasting elements interact in the opportunity process bounded by local spaces. The state is characterized by a complex socioeconomic and formal context shaped by its rich natural resources, including oil, gas, and timber, with a growing prominence on economic diversification due to the looming concern of depleting resources (New Straits Times, 2024). In particular, the state’s economy is significantly driven by the oil and gas sector, but efforts to diversify into agribusiness, tourism, and digital industries are increasingly aggressive, mainly orchestrated by the state government.

As the largest state in Malaysia, Sarawak is endowed with a diverse range of natural resources, including extensive tropical rainforests, fertile lands, and significant water resources; such settings offer fruitful opportunities for agriculture which shapes much of Sarawak’s income and main economic activities (Kaur, 2016). Sarawak’s economic context is predominantly influenced by its natural resources, with its main economic

activity is centred on petroleum and natural gas, forestry, and logging and remained dependent on foreign direct investment for local development (Furuoka, 2011).

During the time when this article was written, the population size of Sarawak is 2.5 million, in comparison to Malaysia's population size of 34.1 million (Department of Statistics Malaysia, 2024). The population is dispersed through 12 parts with distinct heterogeneity in terms of culture, natural resources, infrastructure and labor forces quality and quantity. Socioeconomically, Sarawak faces regional disparities, with urban areas like Kuching experiencing more development compared to its rural counterparts.

Sarawak's natural resources and socioeconomic context is primarily administered by a mix of traditional and modern governance structures, with local and state policies aiming to address economic inequalities and promote sustainable development (Furuoka, 2011). In particular, the legal framework in Sarawak reflects a blend of formal Malaysian laws and local customary laws (*Adat*, or customs in Malay language). While national laws govern the broader legal context, customary laws are applied in matters related to land rights, family issues, and traditional practices, particularly for indigenous communities.

Especially within the context of agribusiness, opportunities within the sector are a result of the complex interaction of the state's resources, socioeconomic background and the role of the government. As there are many contexts similar to that of Sarawak especially in the agribusiness sector, it is worthwhile to investigate the entrepreneurial case of such regions as it may inform policies pertaining to local development and entrepreneurial strategies as it concerns the spatial embeddedness.

Sources of Data

Primary sources of data include the entrepreneurs from four ventures as the main primary source of data and four officers in the state economic development unit focusing on entrepreneurship policy. The participants were able to review the interview topics before the interview sessions begun and all of the participants' names were coded for confidentiality and consistency reasons. Interviewees were contacted by phone prior to interviewing, and were given details about the study; this is to encourage them to prepare for the interviews thereby facilitating informative interview sessions. Four entrepreneurs and four officers were interviewed face-to-face, amounting for 375 minutes of conversation. Interviews were done in English and Bahasa Melayu, taped then carefully transcribed.

We asked the entrepreneurs to explain their journey in agribusiness, specifically the way they spot the opportunities and develop them, in relation to the communities and spaces they belong to. Then, we asked them to elaborate the challenges and opportunities pertaining to conducting agribusinesses within the vast and diverse geographical topography and infrastructure of the state, and the communities relating to their ventures. Secondary data sources were used to enrich the primary data of this study, through validating the findings from the interviews. This was done during and after data collection whereby information from company websites, pamphlets and business association magazines were used to supplement our findings.

Data Analysis

We follow the recommendations by Gioia, Corley and Hamilton (2013) in conducting contextually-bound case studies, especially in gathering and making sense of our data. In reviewing the narratives pertaining to their embeddedness, we also review multiple data sources including the companies' websites and company documents. We analysed the interview narratives through three phases. The first phase entails deductively categorising the codes into two pre-determined dimensions, exploration and exploitation. The second phase focuses on organising the codes into sub-dimensions, which are then inductively synthesised according to the themes emerging from the data. During the course of outlining the framework, data collection, data analysis and the iterations that follow, the researcher employed Nvivo for various purposes including literature sorting, organisation of data sources and coding. This study followed the steps involved in data analysis recommended by Miles and Huberman (1994) and Carney (1990), in addition to Yin's (1994) suggestions in multiple-case study analysis. Based on Pauwels and Matthyssens' recommendations in analysing case studies (2004), the analysis of this study begins with identifying similar codes and categories. The interview transcripts were developed into four main cases, namely Amug, Bekan, Dampa, and Jekau, summarised in Table 1.

Insert Table 1 here

FINDINGS

Cases in this Study

Amug

Amug is a venture committed to tackling farming issues in agriculture in a holistic and dynamic way. Its operations employ a range of approaches, from traditional farming methods to smart farming technology, to create communities of farmers and

agropreneurs through teamwork and collaboration. The organization teaches, trains, guides, and helps market rural farmers produce and market their products. As a venture, Amug offers farmers and consumers of the local market with an integrated supply chain system to eliminate middle men, especially in the Sarawakian agriculture market.

Bekan

Bekan offers a digital marketplace that empowers local hawkers, market traders, farmers, local businesses, and rural communities, started with marketing the brand on Facebook, as well as taking orders and planning deliveries there. Over time, the brand slowly develops its own supply chain ecosystem through various outreach programmes, training and workshops to integrate the local communities, specially farmers, entrepreneurs, and rural communities. The products offered are jungle produce, including fruits, vegetables and leaves from rural farmers for the consumption of people in the local city.

Dampa

Dampa offers an integrated solution for urban farming. Range of products offered include NFT hydroponic systems, planting mediums, seeds, and hydroponics fertilizers. Services provided include setting up hydroponic system to troubleshooting and maintenance. Due to the nature of the products that they offer, Dampa focuses on the larger market beyond the local Sarawakian market, especially the more lucrative peninsular Malaysia and the international market.

Jekau

Jekau's operation mainly focus on assisting plantation unit in designing and installing for fertigation, hydroponic and aquaponic system, in addition to farming and manufacturing products from their farm. They specialize in cultivating Borneo-native crops and process them for the consumption of consumers beyond the Sarawak market,

adapting the products according to the larger market. Based on Sarawak's low population and competition environment, they also involve in training and green house building services.

Cross-case analysis: Spatial embeddedness in network and social embeddedness

In the interviews, we asked about the entrepreneurs' journeys in agribusiness, and asked them to elaborate on the products that they are offering, their main target market, competition and their strategies. Their answers, which are organic, are then coded into our predetermined themes, which are (1) spatial embeddedness and (2) socionetwork embeddedness. The analytic process produced 27 codes from 264 references. The coding process involved three stages; the first included grouping the codes into the predetermined themes, the second stage of coding grouped the codes into similar themes which totaled in 12 themes, the third stage of coding grouped the codes in emerging categories, which are four orientations of agribusiness according to spatial and socionetwork embeddedness, namely state-based spatial embeddedness, state peripheral spatial embeddedness, function-centric socionetwork embeddedness and community-centric socionetwork embeddedness.

Spatial embeddedness

Spatial embeddedness is related to the entrepreneurs' embeddedness with their specific geographic locations, in terms of sales anchorage and market relations. Based on the data, entrepreneurs' spatial embeddedness can be categorized into state-based and state peripheral spatial embeddedness.

State-based spatial embeddedness refer to entrepreneurs' embeddedness with the state; in this category the entrepreneurs, through their ventures are anchored to the state with regards to their sales, suppliers and customers. Specifically, the entrepreneurs are embedded with the local cultural context pertaining to land ownership and rent,

geographical advantage, the rural context and the infrastructure context. The state-based context as a category shows a complex push and pull dynamics as the entrepreneurs navigate the various formal and informal power struggle and infrastructure divide pertaining to the fertile and vast land, as shown in the following quotations:

The Orang Asli (the indigenous community) has a right to claim the ancestral land. It's their right but they have to claim it. Now, both government and the Orang Asli, the only way they can do this and claim this land is by proving development quota, good, greater good of the country. And the keyword is by development, right? So, what type of development? The cheapest would be? Farming. So, somehow, it has been an unknown trend, people like to use farming as white elephant to disguise the main purpose. Actually, it's to grab the land. (Amug)

And then you already have perishable items, we have all these jungle vegetables, from the rural areas. I think this uncle have been with us for quite some time as a supplier farmer, he sells bamboo shoots, quite a lot, 3000 to 5000 kilos per week So our customers are from consumer market and also stores and restaurants. The rest, we sell online. Not a lot of people do a bulk purchases. Then we started to do some with packaging, turned his house into a collection hub, for us to transport our supplies to the mush farther rural areas. That's how we manage our supply chain. (Bekan)

State peripheral spatial embeddedness refer to entrepreneurs who are more embedded with the spaces outside of the state, due to market concentration and the products that they are offering. In general, they offer native-based products as novelty items for

tourists or non-local consumers. In this aspect the businesses within this category utilize the geographical resources of Sarawak for the larger market due to the diverse geographical divide and for the strategic reason of diversifying their income streams, as shown below:

Other than that, we intend to expand this farming model, because we are one of the companies under the eLadang Lab (eFarming Lab), Ministry of Entrepreneurial Development. So we are the first Internet of Things Farm in Malaysia. We also sell these kits (farming kits) in Sarawak, but urban farm sets are not in demand yet here. In Malaysia still use the AB fertilizer, which is considered not organic. That's how we started... we also have collaboration with CENTEXS (Sarawak Centre for Technology Excellence) for two courses.
(Dampa)

We do fertigation farming, chilies. We also do training, we do private sessions every month through partnerships with the government. We also do construction, building greenhouses. We also produce chili sauce from the chilies that we cultivate. That is handled by my brother. (Jekau)

Socionetwork embeddedness

The data revealed two socionetwork orientations for socionetwork embeddedness, namely community-centric and function-centric for entrepreneurs in agribusinesses. Entrepreneurs who are more embeddedness in community-centric socionetwork contexts are more involved with the native community context and the local community in general, as shown in the following quotations:

They give us the publicity because we share with the community. Because we, we at Bekan, even without, with lack of funding, with lack of team, we managed

to get sales. We managed to reach to the community. So, in a good way, I think, we have an impact to the community, there's something that they can utilize.

(Bekan)

For training, there's a ministry that uses our services, they send us to rural areas to train farmers. (Jekau)

Some entrepreneurs are more embedded in the functional network context of the environment; in which they are embedded with the industry players, assisting them with advice and consultation, rather than the local community, as shown in the following:

I'm very careful. It's very selective. If they're not in the right mind and attitude, I don't think so, and especially when they don't ask for help, I don't help. Why? Because I notice one thing. If they don't come to me, "hey, can you help me?" and I offer my help, it feels like one-sided. So, I position myself very well in the community. So, if you need me, you just let me know, and my team can go down and help you and figure out. So, what we do is that when we train them and help them to a certain stage, they need more capital, because I notice one thing, I'm a HRDC (Human Resources Development Corporation) trainer. Even before I was a HRDC trainer, I used to train every day in the church community. So, when I train, I notice one thing they don't use what they learn because they don't have the money to buy pesticide and the license. (Amug)

Our syllabus and certification is from the UK. So with the two courses, when students learn hydroponic technology, then if they want to learn aquaculture, they can combine that into aquaponics. (Dampa)

DISCUSSION

Classification of agroentrepreneurs according to spatial-socionetwork embeddedness

After cross-referencing the narratives of the agropreneurs pertaining to their spatial-socionetwork embeddedness, the data suggests that there are four archetypes of agroentrepreneurs according to the spatial-socionetwork embeddedness aspect, which are (1) homegrown general, (2) homegrown adaptation, (3) native niche and (4) native adaptation.

Homegrown general agropreneurs are spatially embedded within the state, and embedded in their industry's functions. Amug is an entrepreneur in this dimension, as he mainly focuses on the Sarawak market, and have vision for the local market. Socionetwork wise, while he is less embedded with the local community, he is more embedded with the suppliers and industry players within his business category; offering advice and consultation services. Hi venture offers non-native agricultural goods cultivated in the vast and fertile lands, thus offering general goods to specialized audience, which are Sarawakians. To be able to do that, he builds and maintains relationships with large-scale farmers. Homegrown adaptation agropreneurs are spatially embedded within the peripherals of the state, as they are more relevant with the external market; they are also embedded with the suppliers and industry players within his business category, but beyond the local market, as exemplified by Dampa. His venture offers non-native agricultural methods to more generalized audience and build various relationships with multiple supply chain players.

Another archetype is native niche, as exemplified by Began. As an agropreneur, he is spatially embedded in locally within the state and has socionetwork embeddedness with the community, as his venture is intertwined with rural and native communities.

As is venture's products are specifically sourced by natives for natives, he offers specialized knowledge to his audience and maintain relationships with multiple small farmers in scattered areas locally to source rare, jungle vegetables such as bamboo shoots, midin and lempoyang leaves to natives who live in the city. The final archetype is native adaptation, in which agropreneurs leverage their local embeddedness to be relevant to the external market through adaptation. Jekau exemplifies this archetype, as his spatial embeddedness is peripherals of the state and his socionetwork embeddedness is community-centric. His venture leverages on the spatial sourcing advantage by capitalizing on the vast and fertile lands. This enables him to offer the novelty value of native products, marketed as more open through adaptation. In order to achieve such relevance, Jekau maintains relationships with small farmers in specific areas and survive on multiple streams of related income. Examples of products from his venture include cooking pastes, sauces from native plants and training services all focused towards the markets outside of the state. The four cases shape the classification of agropreneurs based on spatial and socionetwork embeddedness, as shown in Figure 1.

Insert Figure 1 here

Spatial embeddedness in a divided context

Space serves individuals and organisations with a parameter to conduct various productive activities (Hidalgo & Hernández, 2001; Raymond et al., 2010) and while this concept has been applied to multiple smaller geographical contexts, spatial embeddedness can be a complex feat for entrepreneurship activities in a divided context. In this research, Sarawak, Malaysia is considered a divided context given its vast and diverse geographical, sociocultural and political make up; a typical characteristic of emerging market. We employ agribusiness as a background as the

entrepreneurs in agribusiness by nature, are embedded in their geographical contexts. We specifically examine their spatial and socionetwork embeddedness in developing their ventures, observing the information exchanges, resource exchanges and opportunity identification. Based on our classification of agropreneurs according to spatial and socionetwork embeddedness in Table 2, we identify the following spatial-socionetwork embeddedness mechanisms for entrepreneurial activities in agrobusiness conducted in a divided context. In this study, Sarawak as a spatial context provides agropreneurs with a large, diverse and complex space coalescing multiple contexts, namely rural aspects, native aspects and the infrastructure aspects.

Information exchanges

In specific spatial contexts, information exchanges occur from suppliers and customers (Malmberg & Maskell, 2006; Stefano et al., 2024), providing entrepreneurs with a space to identify the actors in their supply chain (Müller et al., 2023). As the entrepreneurs are doing business within their own locality, they are able to build and maintain trust with suppliers, farmers and customers through frequent contact and face-to-face interactions. In this study, the entrepreneurs are able to participate in information exchanges by offering the actors in their local context, such as farmers, sellers, students and customers with advice and opportunities such as employment and training opportunities. This enables reduced transaction costs in their exchanges and facilitates the opportunity development process.

Resource exchanges

The spatial context serves as an avenue for entrepreneurs to identify available and lacking resources for resource coordination and mobilisation. The availability of resources and infrastructure in a specific locality will guide an entrepreneur's opportunity development and resource coordination (Müller et al., 2023; Parr, 2002;

Stefano et al., 2024). In this study, the entrepreneurs navigate the resource and infrastructure divide by (1) creating their own entrepreneurial ecosystem and (2) treating the divide as an avenue for opportunity development. As an example, Bekan which is an e-commerce business selling jungle produce to city settlers, typically face with difficulties in ensuring the freshness of the produce as they are procured from farmers in rural areas in Sarawak (the journey from the rural area to the city may take 7-8 hours drive, and includes water transportation) . The entrepreneur navigates this issue by appointing one of the farmers as a warehouse coordinator to, equipping him with tools and machines to keep crops fresh until their next delivery.

Opportunity identification

An entrepreneur's spatial context offers them with a space for opportunity development with its own catalogue of opportunity and resources. Through information exchanges that flow through social networks (Bennett & Chatterji, 2023; Granovetter, 1983)., entrepreneurs are able to be cognisant of the gaps in the markets and tailor strategies to fill such gaps. For agropreneurs in this study, opportunities are identified from entrepreneurs' experiences from their own socionetwork context. As many of them grew up in farms and accumulate technical knowledge and experiences through their formal education and work experiences, they combine such knowledge with the information that they have on their specific locality. For example, the entrepreneur under Amug grew up watching his father, an officer with the agriculture industry deal with the complexities of land ownership in Sarawak; this motivated him to develop an agroventure that helps sellers and farmers minimise such complexities and bureaucracies associated with land ownership in the state. However, some entrepreneurs opt to operate outside of this complexity, by venturing into the external market, as exemplified by Dampa and Jekau.

Research focus: How do entrepreneurs navigate spatial embeddedness in a vast and diverse setting?

Based on our case studies on four distinct agroventures, the data revealed that in a vast and diverse setting, entrepreneurs navigate spatial embeddedness through a combination of (1) state-based or state peripherals spatial embeddedness and (2) function-centric or community-centric socionetwork embeddedness, that shapes the classification of spatial-socionetwork embeddedness for agroentrepreneurship as shown in Table 2. It is also interesting to see that government support and intervention are evident through the four classifications, providing both support and hindrance to the entrepreneurs' business endeavours.

CONCLUSION

Emerging markets are characterized with natural resources, increasingly advanced formal and informal environments, embellished with cultural complexities and divided infrastructural context (Morris et al., 2023). In this aspect, this study examines such complexities through the embeddedness lens, focusing on agroentrepreneurs in Sarawak, Malaysia, specifically asking: "how do entrepreneurs navigate spatial embeddedness in a vast and diverse setting?"

This study was informed by interview narratives with four entrepreneurs in the agribusiness sector, and further supplemented with interviews with officers of the Sarawak entrepreneurial development ministry. Through an embeddedness lens and qualitative approach using case study, this study's findings revealed a classification of spatial-socionetwork embeddedness for agribusinesses, which can be referred to as a model for agroentrepreneurs seeking opportunities in an emerging market. Theory-wise, this research contributes to the discourse of embeddedness in entrepreneurship by

highlighting the structuring role of a space in determining an entrepreneur's resources and opportunity development.

This study's utilisation of abductive qualitative approach using multiple sources of information was beneficial in assisting us to contextualise our research focus. However, as the findings are bounded within this study's context, we suggest a prudent perspective in viewing our paper. The limitations of this study is nevertheless an avenue for future research, whereby studies focusing on agrobusiness in emerging markets can examine this phenomenon in other home and host countries or applying them into a specific industry. In reference to the limitations of the study, this paper encourages future research to examine the phenomenon in different context or field to enable the validity of the findings thus further strengthen the discussion on embeddedness, especially spatial embeddedness.

TABLES AND FIGURES

Table 1 Summary of informants

Code	Interviewee	Year	Industry	Size	Turnover	Main operation	Locality
Amug	CEO	2014	Service	30-75 employees	300000-3mill	B2B and B2C	Malaysia - Sarawak
Bekan	CEO	2017	Service	1-5 employees	300000-3mill	B2C	Malaysia
Dampa	CFO	2016	Service and retail	5-30 employees	300000-3mill	B2B and B2C	Malaysia
	COO						
Jekau	CEO	2014	Service and retail	5-30 employees	300000-3mill	B2B and B2C	Malaysia - Sarawak
Supplementary interviews: Sarawak Community Regulatory Officers							
SC01	Director						
SC02	Manager, marketing						
SC03	Manager, entrepreneurial development						
SC04	Manager, rural business						

		Spatial embeddedness	
		State-based	Peripherals of the state
Socionetwork embeddedness	Function-centric	<p>Homegrown general Amug</p> <ul style="list-style-type: none"> - Non-native agricultural goods cultivated in the vast and fertile lands - Offering general goods to specialized audience - Build relationships with large-scale farmers - Eg: Corns, broccoli for general consumption 	<p>Homegrown adaptation Dampa</p> <ul style="list-style-type: none"> - Non-native agricultural methods - Offering methods to more generalized audience - Build various relationships with multiple supply chain players - Eg: Agricultural machines for hobbyists
	Community-centric	<p>Native niche Bekan</p> <ul style="list-style-type: none"> - Niche - Products are specifically sourced by natives for natives - Offering specialized knowledge to audience - Maintain relationships with multiple small farmers in scattered areas - Eg: Jungle vegetables such as bamboo shoots, midin and lempoyang leaves to natives who live in the city 	<p>Native adaptation Jekau</p> <ul style="list-style-type: none"> - Sourcing advantage – capitalizing on the vast and fertile lands - Offering novelty of native products, marketed as more open through adaptation - Maintain relationships with small farmers in specific areas - Eg: Cooking pastes, sauces from native plants, offering training

Figure 1 Classification of agropreneurs according to spatial-socionetwork embeddedness

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MS0122: A Bibliometric Analysis of Green Brand Research (1995-2023)

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A Bibliometric Analysis of Green Brand Research (1995-2023)

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Extended Abstract

Green branding is an important way to address the challenges of sustainable social development. The aim of this study is to provide a review of progress in research in green brand during 1995-2023 utilizing bibliometric analysis method. The number of publications, countries, intellectual base, hot topics, trends and frontiers of green brand research are identified. A framework of green brand research is put forward from the perspective of green branding mechanism of action. The use of the bibliometric method to review the research in green brand is helpful to deepen our understanding of this field.

Keyword: Green Brand, CiteSpace, Bibliometric Analysis

1. Introduction

Green branding is an important way to address the challenges of sustainable social development. With the popularization of environmental awareness and the increase in consumers' green demand, green branding has become the internal need of enterprise development. The aim of this study is to provide a review of progress in research in green brand during 1995-2023. The number of publications, countries, intellectual base, hot topics, trends and frontiers of green brand research are identified utilizing bibliometric analysis method. This kind of approach can reach a much broader and more diverse range of relevant topics than the conventional expert-compiled review. Computationally assisted literature reviews are intended to provide an additional point of reference with a certain set of benefits (Chen, Dubin, & Kim, 2014). The use of the bibliometric method to review the research in green brand is helpful to deepen our understanding of this field.

2. Main Body

2.1. Materials and Methods

Bibliographic data for this study were obtained from the Social Sciences Citation Index (SSCI) sub-database in the Web of Science Core Collection database. The search topic is ‘green brand*’. The wildcard * is used to capture relevant variations of a word, such as green brand, green brands, and green branding. The document types are article and review article (Chen, Dubin, & Kim, 2014). The search period is 1995-2023. The language of the articles is English. The query resulted in 998 records of original research articles and review papers.

Based on the identified literature, the CiteSpace software (CiteSpace 6.3.R3) was used. CiteSpace is a popular software tool developed by Dr. Chaomei Chen at Drexel University. It primarily focuses on the analysis of citations and co-citations. The time-slicing method is one year per slice. The selection criterion is a modified g-index in each slice, where the scale factor $k=25$. The networks were generated without pruning.

2.2. Results

2.2.1. Number of Publications

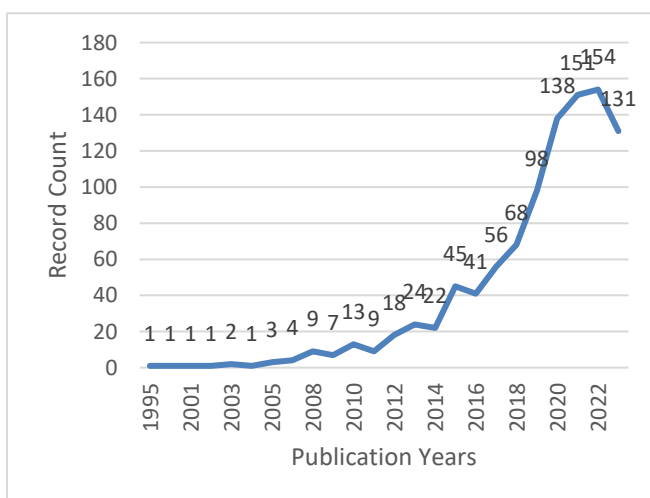


Figure 1. Publications output, 1995–2023.



Figure 2. Country cooperation network.

As Figure 1 shows, the period before 2004 was the embryonic stage of green brand research. Around 2005-2009, the number of annual publications began to grow slowly. From 2010 to 2022, the number of publications in green brand research grew rapidly, and the annual number of publications jumped from the previous single digit to the maximum of 154 in 2022. In 2023, the number of publications began to decline, indicating that green brand research may have entered a period of stable development.

2.2.2. Country Analysis

The countries (regions) with the largest number of papers published under the theme of green brand research are shown in Figure 2. There are 22 countries that have published more than 15 papers in the field of green brand. Both China and the USA have published more than 200 papers, far more than other countries. The intermediary centrality of these two countries is also high, 0.34 in the USA and 0.22 in China, indicating that the authors of these two countries have extensive cooperation and contacts with scholars from other countries.

2.2.3. Intellectual Base

The intellectual base of green brand research is explored through the analysis of cited references. The network of cited references emphasizes the perceived value of scientific publications in terms of how often they are cited by subsequent research. The cited references can be categorized into clusters. The largest 8 clusters are shown in Figure 3. The cluster that remains prosperous hitherto is the largest one labeled as green brand positioning.

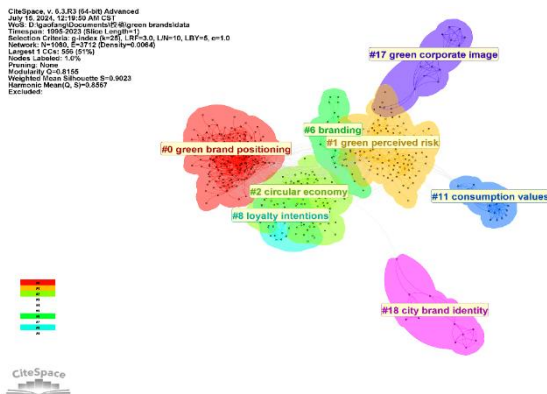


Figure 3. Co-cited references network.

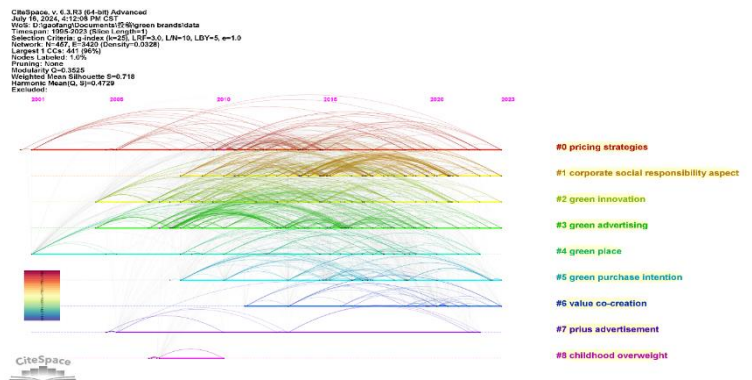


Figure 4. Timeline map for keywords co-occurrence clusters.

2.2.4. Hot Topics

The hot topics in the field of green brand research are detected through keywords co-occurrence analysis (Bhukya, Paul, Kastanakis, & Robinson, 2022). The largest 9 clusters are shown in Figure 4. The clusters that remain prosperous hitherto are labelled as pricing strategies, corporate social responsibility aspect, green innovation, green advertising, green purchase intention, and value co-creation.

2.2.5. Trends and Frontiers

The emerging trends and frontiers in green brand research are inferred with the help of time zone map (Figure 5) and keywords burst analysis (Figure 6). The trends and frontiers are detected from three aspects: research content, research method, and research scenario.

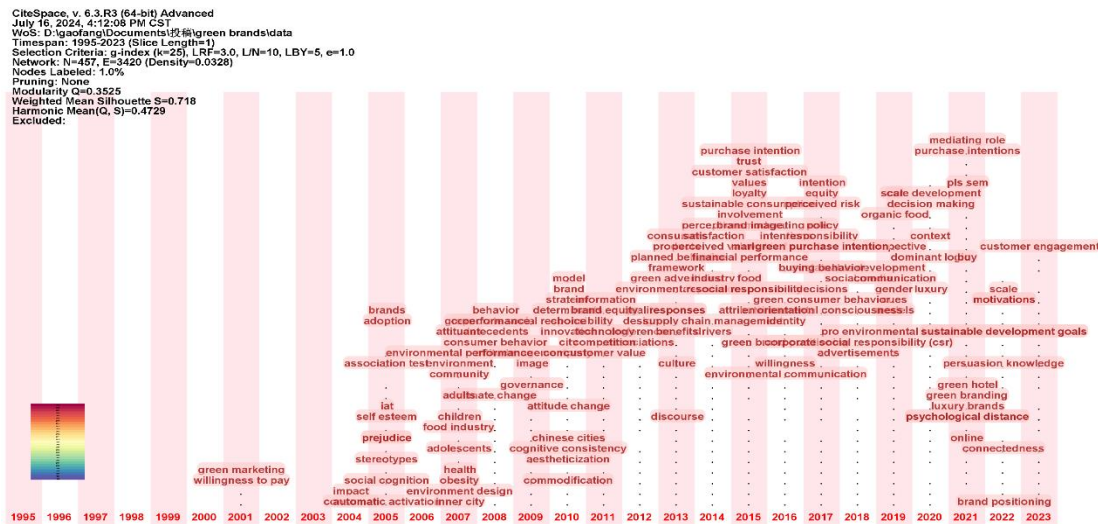


Figure 5. Time zone map of keywords.

Top 10 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	1995 - 2023
claims	2009	4.87	2009	2018	
green marketing	2001	6.79	2010	2016	
model	2010	5.89	2010	2014	
information	2011	3.62	2011	2016	
knowledge	2007	4.84	2013	2016	
environmental concern	2013	3.86	2013	2015	
price	2014	4.74	2014	2019	
decision making	2020	3.54	2020	2021	
mediating role	2021	3.91	2021	2023	

Figure 6. Top 10 keywords with the strongest citation bursts.

2.3. Discussion

Based on the analysis of the important articles above, a framework of green brand research is put forward, as shown in Figure 7. From the perspective of the green branding mechanism of action, there are four main influence modules and one moderator module.

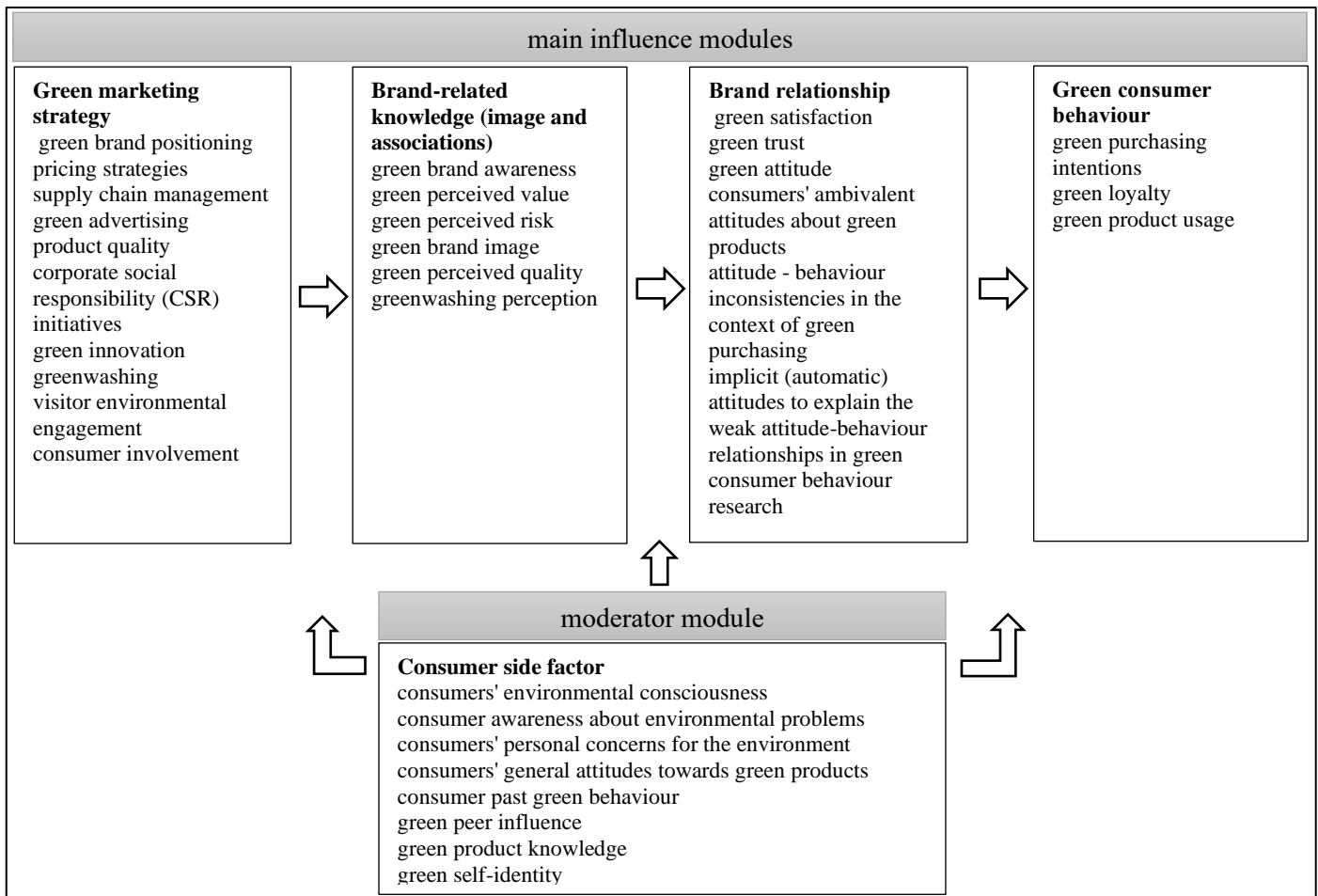


Figure 7. A framework of green brand research.

3. Conclusion

The number of publications over time in the field of green brand research has experienced a course from growing slowly to growing rapidly until reaching the top of 154 in 2022 and declining a little in 2023. There are 22 countries that have published more than 15 papers in the field of green brands. China and the USA have published more than 200 papers, both of which cooperate extensively with other countries. USA is the earliest country to publish green brand articles. England collaborates with other countries

most extensively.

The intellectual base of green brand research that remains prosperous hitherto is the cited articles about green brand positioning. The hot topics in the field of green brand research that remain prosperous hitherto are pricing strategies, corporate social responsibility aspect, green innovation, green advertising, green purchase intention, and value co-creation.

Green branding outcomes (such as purchase intentions) and green marketing strategies (such as customer engagement and green brand positioning) are the frontiers in research contents. The frontiers in research methods are advanced multi-variable statistics technologies and models and new methods suitable for online settings. Green branding in the hospitality industry and luxury goods industry are the frontiers in research scenarios.

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MS0125: Devote Your Attention to the Crowdfunding Design

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Devote your attention to the crowdfunding design

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Extended Abstract

Crowdfunding is defined as an open fundraising campaign launched by individuals, typically garnering small contributions via the Internet (Mollick, 2014). Among its various forms, the reward-based crowdfunding stands out as one of the most prevalent forms. On the reward-based crowdfunding platform, backers offer financial contributions to sponsors, who in turn provide various forms of rewards. Given that crowdfunding products are showcased online and cannot be physically tested, there exists a notable degree of information asymmetry between sponsors and backers. Consequently, it is important for sponsors to disclose pertinent product information comprehensively, as backers make investment decisions based on this data. To mitigate information asymmetry to the greatest extent possible, sponsors of crowdfunding projects should prioritize the crowdfunding design.

Previous studies have widely discussed how backers can alleviate information asymmetry based on the information supplied by sponsors on the platform, subsequently making their investment decisions. These studies primarily investigate whether one or multiple informational cues influence the decision-making of backers (Lin and Boh, 2021). Additionally, some studies explore whether and how multiple

informational cues interact to enhance or weaken each other's influence (Courtney et al., 2017; Xiao et al., 2021). While previous studies have yielded numerous valuable insights, there are still some limitations in various aspects. To systematically investigate the factors influencing crowdfunding performance and their interrelationships, we employ the cue diagnosticity framework to synthesize these factors from the perspectives of sponsors, backers, and the crowdfunding design.

In this article, we differentiate between two types of cues: high scope (comment emotion and sponsor credibility) and low scope (crowdfunding design), and discuss whether and how high-scope cues affect the diagnosticity of low-scope cues. We find that when the comment emotion is positive or the sponsor credibility is high, enhancing the comment emotion renders the crowdfunding design more diagnostic; conversely, augmenting the sponsor credibility diminishes this effect. However, when the comment emotion is negative and the sponsor credibility is low, the crowdfunding design may significantly also influence crowdfunding performance.

Consistent with the cue diagnosticity framework, the findings indicate that for crowdfunding projects with positive comment emotion, the increase in the intensity of comment emotion significantly enhances the influence of crowdfunding design on crowdfunding performance. Nevertheless, for crowdfunding projects launched by high-credibility sponsors, the influence of crowdfunding design on crowdfunding performance diminishes as the sponsor credibility increases. When the comment emotion is negative and the sponsor credibility is low, the crowdfunding design may significantly influence crowdfunding performance.

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MS0126: The Impact of Leadership Empathy on Employees' Innovative Behavior in the Digital Age: A Mediated Moderation Model

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**The Impact of Leadership Empathy on Employees' Innovative Behavior in the Digital Age:
A Mediated Moderation Model**

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Abstract: The shift to online offices, driven by digital transformation, underscores the need for increased leadership empathy. This study, based on social cognition theory, finds that (1) leader empathy enhances innovation, (2) this effect is mediated by self-efficacy, and (3) a supportive digital environment amplifies the link between leader empathy and innovation self-efficacy. These insights clarify how leadership empathy fosters innovation and guide management in the digital era.

Keywords: leadership empathy; employee innovation behavior; innovation self-efficacy; digital support atmosphere; digital transformation

1 Introduction

Digital technology, exemplified by Ctrip's 3+2 work model, has made remote and flexible work possible. Yet, it can also result in communication issues and diminished collaboration. Amid digital transformation, employees are under greater pressure and require empathetic leadership to innovate. This study, applying social cognition theory, investigates the mediating role of innovative self-efficacy in the impact of leader empathy on innovation, considering the digital support atmosphere.

2 Theoretical basis and research assumptions

Social cognitive theory suggests that self-efficacy influences efforts to overcome challenges and achieve goals (Bandura, 1986, 1988). Research shows that leader empathy affects employees' self-efficacy and behaviors. This theory explains how leader empathy impacts employee innovation.

2.1 The Relationship Between Leadership Empathy Ability and Employee Innovation Behavior

Social cognitive theory suggests that environmental stimuli impact cognition and behavior. In digital transformations, employees may feel anxious, but empathetic leaders can alleviate this emotion which fosters innovation (Liu & Wang, 2020). Leader empathy enhances cognition, reduces anxiety and promotes a supportive culture that values input. Therefore, **Hypothesis 1 (H1)** is proposed:

H1: Leaders' empathy is positively correlated with employees' innovative behavior.

2.2 The Mediating Role of Innovation Self-efficacy

Social cognition theory posits that external stimuli shape self-cognition and behavior. Organizational changes may increase employee uncertainty and hinder innovation due to associated risks (Bandura, 1986, 1977). Leadership empathy helps enhance self-efficacy. Supported employees are more

motivated to innovate, with high self-efficacy leading to better goals and performance, while low self-efficacy may result in avoiding challenging tasks. Therefore, **Hypothesis 2 (H2)** is proposed:

H2: Innovation self-efficacy plays a mediating role in the relationship between leadership empathy and employee innovation behavior.

2.3 The Moderating Effect of the Digital Support Atmosphere

Social cognitive theory posits that leadership behavior impacts employee behavior via personal and environmental factors. As digital technology promotes remote work, leaders must connect emotionally with employees to enhance organizational synergy (Zheng & Liu, 2020). A supportive digital environment, with empathetic leadership, boosts communication and feedback, and impacts the link between empathy and employees' innovative self-efficacy. Therefore, **Hypothesis 3 (H3)** is proposed:

H3: The digital support atmosphere moderates the link between leader empathy and employees' innovative self-efficacy, with high support intensifying the relationship, and low having little effect.

Combining **Hypotheses 2 and 3**, this study further proposes **Hypothesis 4 (H4)**:

H4: Supportive digital atmosphere moderated the effect of leadership empathy on employee innovation behavior via self-efficacy, which was amplified at high levels and not significant at low levels.

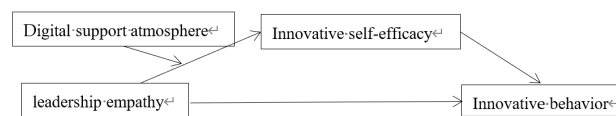


Figure 1. Theoretical model.

3 Research Methods

3.1 Research Sample

We conducted a multisource, multitime field survey targeting digital technology enterprises. At Time 1 (T1), subordinates assessed leadership empathy, innovation self-efficacy, the digital support atmosphere and demographics. From 336 invitations, 310 responses were collected. At Time 2 (T2), supervisors evaluated their subordinates' innovative behavior, with 60 responses collected. After cleaning, 309 valid samples remained (85.6% effectiveness rate). The sample consisted mainly of young, well-educated employees from the private sector and the Internet industry, 51.1% female.

3.2 Measuring Tool

All variables were measured on a five-point Likert scale. Leader empathy ($\alpha = 0.92$), innovation self-efficacy ($\alpha = 0.81$), employee innovation behavior ($\alpha = 0.84$), and digital support atmosphere ($\alpha = 0.83$) were measured using established scales.

4 Results Analysis

4.1 Common Method Bias

AMOS 24.0 analysis indicated no significant common method bias ($\Delta\chi^2/df = 0.038$, $\Delta RMSEA = -0.009$, $\Delta TLI = 0.031$, $\Delta CFI = 0.034$).

4.2 Discriminant Validity

Confirmatory factor analysis confirmed the model's validity, with acceptable values for χ^2/df (2.120), RMSEA (0.060), SRMR (0.050), CFI (0.911), and TLI (0.922).

4.3 Correlation Analysis

Table 1 showed that leadership empathy was positively correlated with innovative self-efficacy ($r = 0.606$, $p < 0.01$) and employee innovation behavior ($r = 0.638$, $p < 0.01$). Innovative self-efficacy correlated positively with the digital support atmosphere ($r = 0.589$, $p < 0.01$), which in turn correlated positively with employee innovation behavior ($r = 0.625$, $p < 0.01$).

Table 1. Descriptive statistics and correlation analysis results

variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1.Sex (T1)	1.510	.500						
2.Age (T1)	2.050	.710	-.002					
3.Education degree(T1)	3.090	.600	-.058	-.088				
4.leader empathy (T1)	3.733	.670	-.015	.043	.070			
5.innovative self-effi- cacy (T1)	3.920	.690	.074	.028	.022	.606**		
6.digital support atmos- phere(T1)	3.968	.733	-.072	-.045	.126*	.704**	.589**	
7.employee innovative behavior (T2)	3.912	.725	.082	-.004	.069	.638**	.781**	.625**

Note: * $p < 0.05$; ** $p < 0.01$

4.4 Hypothesis Testing

4.4.1 Regression Analysis

Table 2 indicates that leader empathy as a dependent variable boosted R^2 from 0.012 to 0.417, significantly forecasting employee innovation ($\beta = 0.690, p < 0.001$), validating **Hypothesis 1**.

Table 2. Summary table of regression analysis

predictor variable	employee innovative behavior			innovative self-efficacy	
	<i>beta</i>	<i>beta</i>	<i>beta</i>	<i>beta</i>	<i>beta</i>
Sex	0.086	0.135*	0.061	0.114	0.146*
Age	0.003	-0.029	-0.030	0.001	0.028
Education degree	0.075	-0.033	0.046	-0.019	-0.054
leader empathy		0.690***	0.283***	0.626***	0.385***
innovative self-efficacy			0.651***		
Digital support atmosphere					0.422***
Leader \times Digital support atmosphere					0.174***
<i>F</i>	1.262	54.328	115.873	45.442	0.469
<i>R</i> ²	0.012	0.417	0.657	0.374	44.496

4.4.2 Analysis of Mediation Effect

Table 2 shows that the mediating effect of leader empathy on innovative behavior decreased from 0.690 ($p < 0.001$) to 0.283 ($p < 0.001$), evidencing mediation. Leader empathy significantly enhanced innovation self-efficacy ($p < 0.001$), validating **Hypothesis 2**, while self-efficacy significantly promoted innovative behavior ($p < 0.001$), confirming **Hypothesis 3**. **Table 3** shows that the 95% confidence intervals for both the direct and mediating effects exclude zero, indicating partial mediation.

Table 3. Decomposition table of the total, direct, and mediating effects

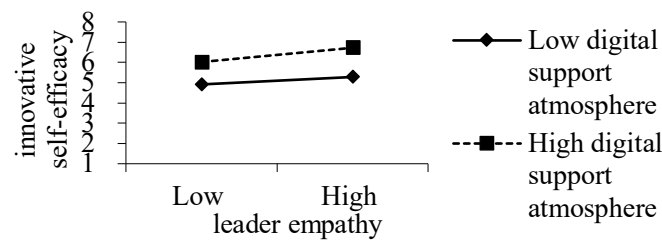
	<i>Effect</i>	<i>Boot SE</i>	<i>Boot UL</i>	<i>Boot LL</i>	<i>Percentage</i>
Indirect effect	0.407	0.052	0.309	0.514	58.95%
Direct effect	0.283	0.054	0.184	0.394	41.05%
Total effect	0.690	0.066	0.564	0.821	

4.4.3 Moderating Effect Analysis

Table 2 shows a significant interaction between leader empathy and digital support atmosphere on innovation self-efficacy. **Table 4** reveals that leader empathy's positive impact on innovation self-efficacy was modest under low digital support, while high support strengthened it. This suggests that a high digital support atmosphere enhances the impact of leader empathy on innovation self-efficacy.

Table 5. Direct and mediating effects at different levels of the digital support atmosphere

Digital support atmosphere		<i>Effect</i>	<i>Boot SE</i>	<i>Boot lower limit</i>	<i>Boot cap</i>
Moderated mediation	eff1(<i>M-ISD</i>)	0.167	0.069	0.042	0.317
	eff2(<i>M</i>)	0.250	0.067	0.128	0.392
	eff3(<i>M+ISD</i>)	0.333	0.076	0.192	0.487
Moderated	eff2-eff1	0.083	0.028	0.013	0.124
Mediation	eff3-eff1	0.166	0.056	0.026	0.248
Contrast	eff3-eff2	0.083	0.028	0.013	0.124

**Figure 2.** The moderating effect of a digital support atmosphere

5 General Discussion

This study examines leader empathy's impact on employee innovation in the digital age. Social cognition theory suggests leader empathy fosters employees during innovation uncertainties, boosting performance. Higher innovation self-efficacy promotes employees' innovation behavior. A positive digital support atmosphere amplifies the effect of leadership empathy on innovation self-efficacy.

5.1 Theoretical Significance

Study explores leader empathy's impact on innovation via self-efficacy, highlighting supportive digital atmosphere's role, expanding current literature on individual and organizational factors impacting innovation, and examining leader empathy & digital support's synergy for innovation performance.

5.2 Practical Significance

This study provides key management insights. Leaders need empathy to build an inclusive culture, respecting young workers' values. A supportive digital environment aids leadership empathy. Managers can boost innovation by supporting, recognizing, and guiding employees during challenges.

5.3 Research Limitations and Future Prospects

There are some limitations to the study. Self-assessments may cause bias. Future research should delve into other effects of leader empathy in digital settings, additional leadership empathy aspects, potential negatives, and its evolving impact on performance over time.

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MS0127: When the Thrill Lingers: How Post-Purchase Flow Consciousness Shapes Live Stream Shopping Engagement

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When the Thrill Lingers: How Post-Purchase Flow Consciousness Shapes Live Stream Shopping

Engagement

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Extended Abstract

The immersive live stream shopping induces a “flow” state, potentially leading to impulsive purchases and subsequent regret. This study explores if flow consciousness mitigates post-purchase regret and increases enjoyment, enhancing consumer engagement. It also explores the impact of return policies. Using experiments and survey studies, findings suggest that flow consciousness reduces post-purchase regret and increases enjoyment, enhancing consumer engagement. Importantly, lenient return policies are shown to sustain these positive effects. This research expands on flow theory, offering management implications for digital retailers.

Keywords: Live Streaming E-commerce, Flow Consciousness, Post-purchase Emotions, Return Policy, Consumer Engagement

1. Introduction

Live streaming e-commerce creates memorable and enjoyable shopping experiences and induces a “flow” state in consumers, which leads to impulsive purchases. Characterized by reduced cognitive deliberation, this state may result in post-purchase emotions ranging from guilt to excitement. The “flow consciousness” significantly affect post-purchase emotions (Herrando & Jimenez-Martinez & Hoyos, 2018), allowing consumers to maintain a positive perception of their shopping experience (Barta & Gurrea & Flavián, 2022). Attribution theory posits that consumers with flow consciousness are more likely to attribute their purchases to external factors (Heider, 1958), increasing the likelihood of repeat purchases.

Live stream platforms often mitigate purchase risks with lenient return policies, encouraging spontaneous buying (Petersen & Kumar, 2009; Wood, 2001). However, it is not known how varying levels of post-purchase flow consciousness may influence customer emotions and subsequent engagement under different return policy scenarios. To address these research gaps, this study employs data from experimental studies and a survey to investigate the role of flow consciousness in post-purchase emotions and engagement, and the moderating effect of return policies in live stream shopping contexts.

2. Literature and Framework

The literature on live streaming has examined various aspects such as impulsive buying (Lo & Dwivedi & Tan & Ooi & Aw & Metri, 2022), consumer trust and engagement (Wongkitrungrueng & Assarut, 2020), and pricing (Ma & Wang & Liu, 2022). However, psychological states during live stream shopping and their impact on post-purchase behaviors are under-studied. Several researchers have applied the “flow” concept online shopping, highlighting deep engagement and the immersive nature of live streaming through streamers’ interactional styles (Csikszentmihalyi, 1990; Zhang & Li & Qian & Li & Yuan, 2024). Studies have also explored factors influencing purchase intentions in live streaming (Chen & Dou & Xiao, 2023), but the unique dynamics shaping consumers’ subsequent evaluations and engagement is unclear, especially the effect of return policy. This study addresses gaps by examining the role of flow consciousness in live stream shopping, its interaction with return policies, and their effects on post-purchase regret, enjoyment, and consumer engagement.

This study integrates the attribution theory and cognitive dissonance theory to explore the impact of post-purchase flow awareness on consumer engagement, regret, and enjoyment, and the moderating effect of return policy. As illustrated in Figure 1, flow consciousness, as a meta-cognitive construct, refers to an individual’s recognition of having recently experienced a flow state during a consumer experience. In the context of live stream shopping, this entails the recollection of immersive and pleasurable experiences associated with the live streaming activities. This retrospective awareness enables consumers to attribute the positive emotions of the flow state to the shopping platform or brand, thus enhancing engagement. Thus,

Hypothesis 1: Flow consciousness is positively related to post-purchase consumer engagement.

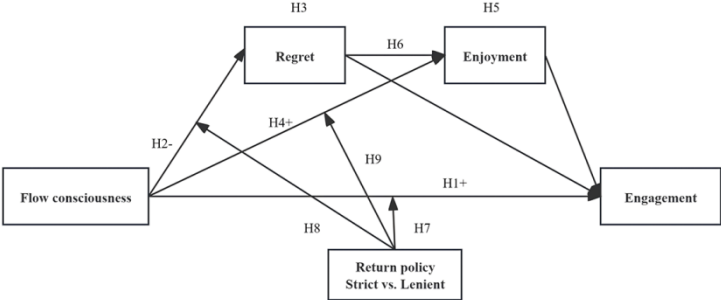


Figure 1 Conceptual framework

Post-purchase regret often follows impulsive buying and is characterized by negative emotions and self-blame. Consumers tend to attribute undesirable purchase outcomes to internal factors, which exacerbates regret. However, flow consciousness can shift the attribution of regret from personal flaws to the pleasurable experience of shopping. This shift in perceived control from internal to external factors reduces regret. Lower regret subsequently enables greater consumer engagement. Therefore,

Hypothesis 2: Flow consciousness can reduce consumers’ feelings of regret after impulsive purchases through e-commerce live streams.

Hypothesis 3: Flow consciousness increases consumer engagement by reducing post-purchase regret.

According to cognitive dissonance theory, flow consciousness helps mitigate any dissonance from buyer’s remorse and enhance post-purchase enjoyment by paying attention to the preceding positive flow sensations rather than negative elements, subsequently encouraging intentions to

repurchase from and recommend the associate live broadcaster, retailer, and brands. Therefore,

Hypothesis 4: Flow consciousness is positively to feelings of enjoyment among consumers after impulsive buying in e-commerce live streams.

Hypothesis 5: Flow consciousness increases post-purchase consumer engagement through perceived enjoyment.

Hypothesis 6: Flow consciousness increases consumers' enjoyment by reducing post-purchase regret, thereby increasing consumer engagement.

Strict return policies can hinder consumers from easily altering their decisions, thereby amplifying regret, diminishing post-purchase enjoyment, and resulting in resentment, dissatisfaction, and damaged perceptions of the retailer, thereby diminishing the impact of flow consciousness on consumer engagement. Lenient return policies offer consumers greater control and flexibility, reducing the risks associated with impulsive purchase decisions made under high flow consciousness. Thus,

Hypothesis 7: return policy leniency moderates the relationship between flow consciousness and consumer engagement after impulsive purchases in e-commerce live streaming, with a stricter policy (vs. lenient) strengthening this relationship.

Hypothesis 8: return policy leniency moderates the relationship between flow consciousness and consumer regret after impulsive purchases in e-commerce live streaming, with a stricter policy (vs. lenient) strengthening this relationship.

Hypothesis 9: return policy leniency moderates the relationship between flow consciousness and consumer enjoyment after impulsive purchases in e-commerce live streaming, with a stricter policy (vs. lenient) strengthening this relationship.

3. Method and results

This research integrates experimental and survey methodologies to investigate the influence of flow consciousness on consumer engagement after impulsive purchases in live-stream shopping. The hypotheses were verified by statistical tests including independent-sample T-tests, ANOVA and path analysis. Study 1 employed a recall-based experiment to establish the main effect of flow consciousness on consumer engagement, with a pre-experiment validating the manipulation of flow consciousness in 40 participants. The main experiment enrolled 130 participants randomly assigned to

groups differing in flow consciousness levels, and used a validated scale of consumer engagement incorporated with reverse questions. Study 1 confirms that high flow consciousness significantly increases consumer engagement compared to low flow consciousness (supporting Hypothesis 1).

Study 2 used a questionnaire survey to examine the mediating roles of regret and enjoyment, adjusting established scales for the live-stream context. Study 2 reveals that flow consciousness is negatively to regret and positively to enjoyment (supporting Hypothesis 2 and 4). Flow consciousness indirectly enhances consumer engagement by reduced post-purchase regret and increased post-purchase enjoyment (supporting Hypothesis 3 and 5), as well as through a sequential mediation of decreased regret and increased enjoyment (supporting Hypothesis 6). Furthermore, Study 2 excludes the alternative explanation based on guilt.

Study 3 employed a 2 (flow consciousness: high vs. low) x 2 (return policy leniency: strict vs. lenient) between-subjects experimental design to explore the moderating effect of return policy leniency, manipulating conditions via situational descriptions. Study 3 demonstrates under a strict return policy, an interaction effect where high flow consciousness has a stronger positive effect on consumer engagement and enjoyment, and low flow consciousness consumers experienced higher post-purchase regret (supporting Hypothesis 7-9).

4. Discussion

This study advances live stream shopping research by establishing flow consciousness as a key driver of consumer engagement and highlighting the moderating effect of return policy leniency. Building on prior work that emphasized the in-moment state of flow, the research confirms that flow experiences have lasting impacts and the ability to enhance post-purchase experiences, extending its theoretical reach beyond the fleeting in-the-moment state. The findings extend previous research on the signaling and risk-reduction effects of lenient return policies (Petersen & Kumar, 2009; Wood, 2001).

On the practical front, the research advises e-commerce platforms to optimize flow experiences and design return policies to minimize risk while maintaining operational efficiency. Moreover, businesses should identify key touchpoints in the consumer journey where interventions related to flow awareness and return policies are most effective. The study's reliance on self-reported data

suggests a need for future research to employ objective metrics like comments and trace data to gauge engagement. Further exploration into the long-term effects of flow consciousness on brand loyalty and the impact of specific live-stream elements (such as broadcaster identity and transaction format) on engagement is warranted.

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MS0128: A Hybrid Deep Learning Model for Carbon Price Prediction

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A hybrid deep learning model for carbon price prediction

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Extended Abstract

Carbon price fluctuations affect the business environment of multinational enterprises and development trajectories of economies. Carbon prices are highly volatile due to intricate relationships between various factors, policy shifts and market sentiments. To address the difficulty of predicting carbon prices, a hybrid model that combines convolutional neural network (CNN), bidirectional gated recurrent unit (BiGRU), and global average pooling (GAP) is proposed. This CNN-BiGRU-GAP model leverages abundant data, including technical indicators and energy variables, to predict market trends with high accuracy and precision. This is crucial for decision-making of multinational enterprises in the global transition to a low-carbon economy.

Keyword: Bidirectional gated recurrent unit, carbon prices, convolutional neural network, global average pooling, prediction

1. Introduction

As the world's economic development and technological advancement progress, carbon emissions have become an issue of global concern (Newell and Paterson, 2010). Due to the complexity and interdependence of factors such as regulatory changes, technological innovations, and geopolitical developments that affect carbon prices, accurately predicting carbon prices is a challenging task.

In the recent few years, there is a blossoming of studies that adopt deep learning techniques to predict carbon prices more accurately than traditional methods such as time series models. For example, Wang et al. (2021) make use of the bidirectional gated recurrent unit (BiGRU) in their combination model, Yang et al. (2021) introduce an integrated prediction system that combines models such as bidirectional long short-term memory (BiLSTM), convolutional neural networks (CNN), and extreme learning machines.

Among the existing deep learning technologies, CNN and BiGRU can be highlighted. The former has a strong learning ability in market trend prediction, while the latter performs well in reducing prediction errors and forgetting (Ran et al., 2024). This paper aims to combine these two technologies to build a prediction model and introduce a global average pooling (GAP) layer to enhance the model's adaptability to various data scenarios.

Given the complexity of the market for carbon emissions, relying solely on historical carbon prices as inputs in prediction models is often insufficient to achieve prediction accuracy. Therefore, Zhang and Tang (2023) employ both technical indicators and economic variables in their ensemble learning algorithms to forecast carbon prices. However, there is a paucity of studies that utilize auxiliary data in deep learning models for carbon price prediction, and the benefits of drawing on additional data are yet to be explored.

This paper introduces an advanced deep learning model, CNN-BiGRU-GAP, that incorporates technical indicators and energy variables. This novel model outperforms traditional models such as CNN, GRU, LSTM, and RNN with reference to various assessment criteria. By integrating technical indicators and energy variables, the model provides deeper insights into the market dynamics, thereby enhancing forecast accuracy of carbon prices.

2. Experimental design

Predicting carbon price fluctuations is complex due to the intricacies of carbon price determination

mechanism. Figure 1 shows in detail the steps and methods involved in the proposed prediction process.

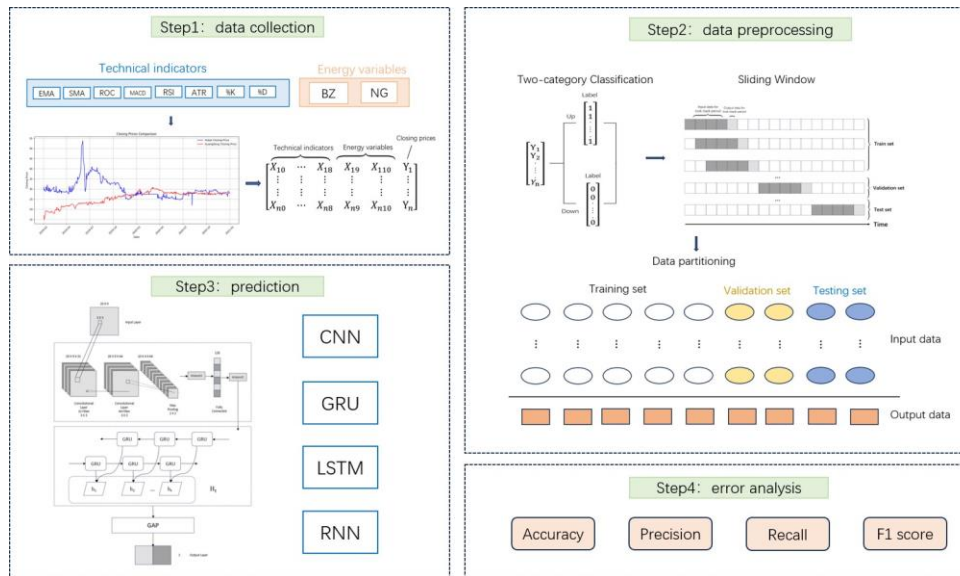


Figure 1: Carbon price prediction process diagram

2.1. Data description

We select two typical provinces in China, Hubei and Guangdong, to assess the performance of the proposed prediction model. Closing carbon price data come from the China Carbon Trading Website. The sample spans the period of January 2, 2019 to December 30, 2020.

In addition to carbon price data, we also select eight representative technical indicators in the financial market as input factors, namely exponential moving average (EMA), simple moving average (SMA), rate of change (ROC), moving average convergence divergence (MACD), relative strength index (RSI), average true range (ATR), stochastic oscillator %K (%K), and stochastic oscillator %D (%D). We also consider the energy variables of Brent crude oil futures prices (BZ) and natural gas futures prices (NG). Table 1 displays the model input features used in our study.

Table 1: Features used as inputs for the model

Model Name	Input Variables
Model-base	Closing Price
Model-4TI	Closing Price, EMA, SMA, ROC, MACD
Model-8TI	Closing Price, EMA, SMA, ROC, MACD, RSI, ATR, Fast %K, Slow %D
Model-BZNG	Closing Price, BZ, NG

2.2. Data preprocessing

Data preprocessing includes two key steps: reconstructing data by dividing carbon prices into “up” and “down”, and applying sliding window technology for time series forecasting. Data from January 2, 2019 to September 1, 2020 are used as the training set and validation set in accordance with the 8:2 ratio, while the test set contains data after September 1, 2020.

2.3. CNN-BiGRU-GAP model

The CNN-BiGRU-GAP model combines CNN for local patterns, denoising, and accuracy, BiGRU for long-term dependencies and adaptability, and GAP layers for feature preservation and computational efficiency. The optimized CNN-BiGRU-GAP model consists of a 2D convolutional layer with 32 filters of size 3x3 and ReLU activation function, followed by 64 convolutional layers of size 3x3, both with “same” padding. Feature downsampling is done through a max pooling layer (2x2), and overfitting is mitigated by a dropout layer. A dense layer with 128 units and ReLU activation function smoothes the data, which is followed by a bidirectional GRU layer (128 units) to capture temporal dependencies bidirectionally. A GAP layer suppresses overfitting, and is followed by a two-unit dense layer with softmax activation function for classification. The model is optimized using the Adam optimizer, categorical cross entropy loss, and accuracy metric.

2.4. Benchmark models and assessment metrics

The proposed model is compared with various traditional deep learning models, including CNN, GRU, LSTM, and RNN. The assessment metrics of accuracy, precision, recall, and F1 score are employed to evaluate the effectiveness of the proposed model against these benchmark models.

3. Results and discussion

The results for the baseline case (CNN-BiGRU-GAP-base) using carbon prices as the only input are

shown in Table 2. With the Hubei Province dataset, the values of accuracy, precision, recall and F1 score of our model are higher than those of other models. This means that our model can capture relevant information about carbon prices more accurately, thereby achieving higher prediction precision.

Table 2: Results with carbon prices as inputs

Area	Model name	Accuracy	Precision	Recall	F1 Score
Hubei	CNN-base	0.56	0.5	0.515151	0.507462
	GRU-base	0.586666	0.529411	0.545454	0.537313
	LSTM-base	0.6	0.538461	0.636363	0.583333
	RNN-base	0.573333	0.516129	0.484848	0.5
	CNN-BiGRU-GAP-base	0.613333	0.55	0.666666	0.602739
Guangdong	CNN-base	0.546667	0.483870	0.454545	0.468759
	GRU-base	0.56	0.5	0.454545	0.476190
	LSTM-base	0.546666	0.484848	0.484848	0.484848
	RNN-base	0.493333	0.464788	1.0	0.634615
	CNN-BiGRU-GAP-base	0.573333	0.517241	0.454545	0.483870

The results from using technical indicators as additional inputs are shown in Table 3. Employing four of the technical indicators (CNN-BiGRU-GAP-4TI), our model performs best on the Hubei dataset with reference to all assessment metrics, and best on the Guangdong dataset with respect to all metrics except for recall. In the case of eight technical indicators (CNN-BiGRU-GAP-8TI), our model performs best on both datasets under all evaluation criteria, with a prediction accuracy of over 75%.

Table 3: Results with technical indicators as additional inputs

Area	Model name	Accuracy	Precision	Recall	F1 Score
Hubei	CNN-4TI	0.628571	0.545454	0.620689	0.580645
	CNN-8TI	0.642857	0.5625	0.620689	0.590163
	GRU-4TI	0.628571	0.548387	0.586206	0.566666
	GRU-8TI	0.742857	0.72	0.620689	0.666666
	LSTM-4TI	0.642857	0.552631	0.724137	0.626865
	LSTM-8TI	0.714285	0.645161	0.689655	0.666666
	RNN-4TI	0.6	0.513513	0.655172	0.575757
	RNN-8TI	0.628571	0.536585	0.75862	0.628571
	CNN-BiGRU-GAP-4TI	0.728571	0.65625	0.724137	0.68852
	CNN-BiGRU-GAP-8TI	0.757142	0.6875	0.758620	0.721311
Guangdong	CNN-4TI	0.657142	0.6	0.517241	0.55555
	CNN-8TI	0.728571	0.708333	0.586206	0.641509
	GRU-4TI	0.628571	0.555555	0.517241	0.535714
	GRU-8TI	0.714285	0.666666	0.620689	0.642857
	LSTM-4TI	0.6	0.514285	0.620689	0.5625
	LSTM-8TI	0.657142	0.592592	0.551724	0.571428
	RNN-4TI	0.614285	0.526315	0.689655	0.597014
	RNN-8TI	0.628571	0.540540	0.689655	0.606060
	CNN-BiGRU-GAP-4TI	0.685714	0.62962	0.586206	0.607142
	CNN-BiGRU-GAP-8TI	0.771428	0.740740	0.689655	0.714285

Table 4 also shows the results when using the two energy variables as additional inputs in our model (CNN-BiGRU-GAP-BZNG). With both datasets, our model performs best in all four evaluation metrics.

Table 4: Results with energy variables as additional inputs

Area	Model name	Accuracy	Precision	Recall	F1 Score
Hubei	CNN-BZNG	0.643835	0.575	0.71875	0.638888
	GRU-BZNG	0.657534	0.585365	0.75	0.657534
	LSTM-BZNG	0.616438	0.555555	0.625	0.588235
	RNN-BZNG	0.589041	0.526315	0.625	0.571428
	CNN-BiGRU-GAP-BZNG	0.671232	0.595238	0.78125	0.675675
Guangdong	CNN-BZNG	0.616438	0.547619	0.71875	0.621621
	GRU-BZNG	0.643835	0.575	0.71875	0.638888
	LSTM-BZNG	0.602739	0.540540	0.625	0.579710
	RNN-BZNG	0.575342	0.518518	0.4375	0.474576
	CNN-BiGRU-GAP-BZNG	0.657534	0.577777	0.8125	0.675324

Overall, the results suggest superior performance of the proposed model over the benchmark ones in forecasting dynamic carbon prices. This is vital for multinational enterprises in making business decisions as the world transits to a low-carbon economy.

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MS0130: Evolutionary Characteristics and Strategy Research of Trade Relations between China and EU Countries from the Perspective of Global Value Chains

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Evolutionary Characteristics and Strategy Research of Trade Relations between China and EU Countries from the Perspective of Global Value Chains

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Extended Abstract

This paper analyzes the evolving characteristics and strategies of trade relations between China and EU countries from 2003 to 2014, based on the perspective of the Global Value Chain (GVC) and utilizing trade data. By constructing two core indicators—the Bilateral Cooperation Index and the Relative Position Index within the Value Chain—it examines the degree of close cooperation, division of labor, and dynamic changes between China and EU countries in the GVC. The study finds that the trade relationship between China and EU countries during this period exhibits significant interaction and complexity. Specifically, the cooperation between China and EU countries is tight, with both the cooperation level and division of labor status showing an overall upward trend, particularly notable in cooperation with Germany, indicating a high degree of interdependence. Furthermore, there are significant disparities in participation within the GVC among EU countries, with Western European developed countries like Germany and the Netherlands occupying advantageous positions, while some Eastern European countries such as Estonia and Greece are relatively marginalized. The evolution of trade relations between China and the EU is influenced by various factors, reflecting its complexity. Based on these findings, China should continue to deepen regional economic integration and cooperation, pay attention to internal differences within the EU, and implement differentiated strategies to promote the ongoing optimization and upgrading of the GVC.

Keyword: Global Value Chain (GVC), EU Countries, Bilateral Cooperation Index, Relative Position

Index, Evolutionary Characteristics

1. Introduction

The trade relations and interactions between China and the European Union (EU), as two significant economies in the global economic system, have garnered considerable attention. The protracted and intricate nature of the China-U.S. trade disputes further underscores the importance of deepening cooperation between China and the EU to jointly tackle global economic challenges. Faced with uncertainties in the global economic environment, an in-depth analysis and exploration of China-EU trade relations within the GVC division of labor framework is particularly urgent.

While existing research on China-EU trade relations is abundant, it is often confined to the perspective of gross trade or relies solely on value-added decomposition methods, lacking a comprehensive analysis from the overall GVC framework. Moreover, these studies tend to treat the EU as a monolithic entity, overlooking the heterogeneity among its member states. Therefore, this paper endeavors to adopt a combined approach of gross trade accounting and value-added trade accounting to construct a comprehensive measurement index system, systematically examining the evolutionary patterns of China-EU trade relations from 2003 to 2014. Specifically, this paper delves into the following core questions: How close is the cooperation between China and EU countries within the GVC? What are the differences in their division of labor status within the GVC? What specific characteristics and evolutionary trends do both sides exhibit in the process of GVC upgrading? What implications do these characteristics and trends have for economic cooperation and policy formulation between the two sides and globally? Answering these questions not only contributes to uncovering the in-depth trade relations and division of labor status between China and EU countries within the GVC but also provides new perspectives and empirical support for economic cooperation and policy formulation, both locally and globally.

2. Research Methodology and Data Sources

2.1. Decomposition of Export Value-Added

To conduct an in-depth analysis of the bilateral cooperation degree and upstream-downstream relationships within the global value chain (GVC) between China and EU countries, this study establishes an input-output model at both the national and industrial levels under the framework of the Gross Trade Accounting approach. Furthermore, it incorporates disaggregated data from the secondary processing of input-output data conducted by the University of International Business and Economics' Global Value Chain Research Institute to decompose the value-added in bilateral trade exports between China and EU countries. Based on this decomposition, we proceed with the construction and measurement of two-dimensional indicators, aiming to quantify and evaluate the bilateral cooperation degree and relative division of labor status within the GVC between China and EU countries. The specific meanings of each component in the Gross Trade Accounting approach are outlined in Table 1.

Table 1: Decomposition Sectors and Their Meanings for Export Value-Added under the Gross Trade Accounting Approach

Component	Codes	Specific Meaning
DVA	T1-T5	Domestic value added absorbed by foreign countries
DVA_FIN	T1	Domestic value added in final products absorbed by importing countries
DVA_INT	T2	Domestic value added in intermediate goods absorbed by direct importing countries
DVA_INTREX	T3-T5	Domestic value added in intermediate goods produced by direct importing countries and re-exported to third countries
RDV	T6-T8	Domestic value added that is returned and absorbed by the home country
FVA	T11-T12,T14-T15	Foreign value added
FVA_FIN	T11,T14	Foreign value added in final exports
FVA_INT	T12,T15	Foreign value added in intermediate exports
PDC	T9-T10,T13,T16	Components that are purely double-counted
DDC	T9-T10	Purely double-counted components originating from domestic accounts
FDC	T13,T16	Purely double-counted components originating from foreign accounts

2.2. Index Construction

This study further constructs a bilateral cooperation index and a relative position index within the value chain. The bilateral cooperation index quantifies the degree of cooperation between China and EU countries within the global value chain. The relative position index assesses China's division of labor status relative to the EU, providing a comprehensive analysis of the dynamic changes and interrelationships between China and EU countries in the global value chain. This paper employs value chain forward linkages and backward linkages as proxy variables for the degree of bilateral cooperation and the relative division of labor position. The calculation methods for the value chain forward linkage index (denoted as FD_{ij}) and the value chain backward linkage index (denoted as BD_{ij}) are defined in Formulas (1) and (2), respectively.

$$FD_{ij} = \frac{DVA_{rexij}}{E_i + E_j} \times 100 \quad (1)$$

$$BD_{ij} = \frac{MVA_{ij}}{E_i + E_j} \times 100 \quad (2)$$

1. Bilateral Cooperation Index within the Value Chain

$$GVC_pa_{ij} = \left(\frac{DVA_{rexij}}{E_i + E_j} + \frac{MVA_{ij}}{E_i + E_j} \right) \times 100 \quad (3)$$

The bilateral cooperation index within the value chain is represented by the sum of the value chain forward linkage index and the value chain backward linkage index. A higher value of the bilateral cooperation index indicates a stronger degree of cooperation between China and EU countries in their participation in the division of labor within the global value chain.

2. Relative Position Index within the Value Chain

$$GVC_po_{ij} = \left[\ln \left(1 + \frac{DVA_{rexij}}{E_i + E_j} \right) - \ln \left(1 + \frac{MVA_{ij}}{E_i + E_j} \right) \right] \times 100 \quad (4)$$

The relative position index within the value chain is expressed as the difference between the logarithm of the value chain forward linkage index and the logarithm of the value chain backward linkage index. If the former is greater than the latter, it suggests that China primarily participates in the global value chain by providing raw materials and intermediate goods to EU countries. Conversely, if the latter is greater than the former, it indicates that China relies more on importing intermediate goods from EU countries to produce its final products, implying that China's final products contain a significant amount of value added from EU intermediate goods. A higher value of the relative position index signifies a more advanced position for China relative to EU countries in the division of labor within the global value chain.

2.3. Data Sources

The data used in this paper are derived from the World Input-Output Tables (WIOTs) published by the World Input-Output Database (WIOD) in 2016. This dataset covers the time range from 2003 to 2014, encompassing 44 countries, including EU member states, and spans 56 industries (with industry codes ranging from c1 to c56).

3. Empirical Analysis

3.1. Analysis of Trade Relations between China and EU Countries

Taking 2014 as an example, this section analyzes the bilateral cooperation index and the relative position index within the value chain between China and the 28 EU member states. According to the calculation results presented in Table 2, significant disparities are observed in the strength of cooperation between China and individual EU countries based on the bilateral cooperation index. Notably, the cooperation between China and Germany stands out as the most prominent, with their bilateral cooperation index ranking at the forefront. This underscores the high degree of synergy and deep interdependence between the two countries in participating in the division of labor within the global value chain, reinforcing the pivotal role of Sino-German economic relations in the global economic landscape. This finding aligns

with the research conclusions of Dai Ling and Pan An (2022), which emphasize the leading position of China and Germany in global value chain cooperation.

Further analysis of the relative position index reveals a unique dynamic between China and Germany. Specifically, the domestic value added embodied in Chinese intermediate goods exported to Germany and subsequently re-exported to third countries is significantly higher than the German value added implicit in China's exports. This data reflects Germany's high dependence on Chinese intermediate goods and highlights China's relative advantage in specific segments of the global value chain, enabling it to provide crucial production factors and intermediate products to developed countries like Germany.

Moreover, the study findings underscore the notable heterogeneity in the degree of participation in the global value chain among EU member states. Developed countries such as Germany, France, and the Netherlands actively engage in the division of labor within the global value chain by supplying high-quality intermediate goods and deriving substantial value added from this process. In contrast, some Eastern European countries exhibit lower levels of participation, potentially functioning more as "ancillary production capacities" reliant on core EU countries for their involvement in global economic activities. This discovery echoes existing research on intra-EU economic integration and patterns of global value chain participation, offering fresh insights into the complexity of the EU's internal economic structure.

Table 2: Bilateral Cooperation Index and Relative Position Index of Value Chains between China and EU Countries in 2014.

Country	Bilateral Cooperation Index	Relative Position Index
Germany	0.423	0.334
Netherlands	0.385	0.323
France	0.224	0.197
Italy	0.184	0.167
United Kingdom	0.167	0.148
Belgium	0.132	0.123
Czech Republic	0.128	0.120
Spain	0.123	0.115

Poland	0.111	0.105
Sweden	0.111	0.105
Hungary	0.101	0.096
Finland	0.063	0.061
Denmark	0.062	0.060
Ireland	0.040	0.039
Austria	0.035	0.034
Slovakia	0.032	0.031
Romania	0.017	0.017
Estonia	0.016	0.016
Portugal	0.015	0.015
Slovenia	0.013	0.013
Greece	0.010	0.010
Luxembourg	0.008	0.008
Lithuania	0.008	0.008
Bulgaria	0.007	0.007
Malta	0.004	0.004
Latvia	0.004	0.004
Croatia	0.004	0.004
Cyprus	0.003	0.003

Data Source: Self-calculated by the author.

3.2. Analysis of the Evolutionary Characteristics and Trends in the Trade Relationship between China and European Union Countries

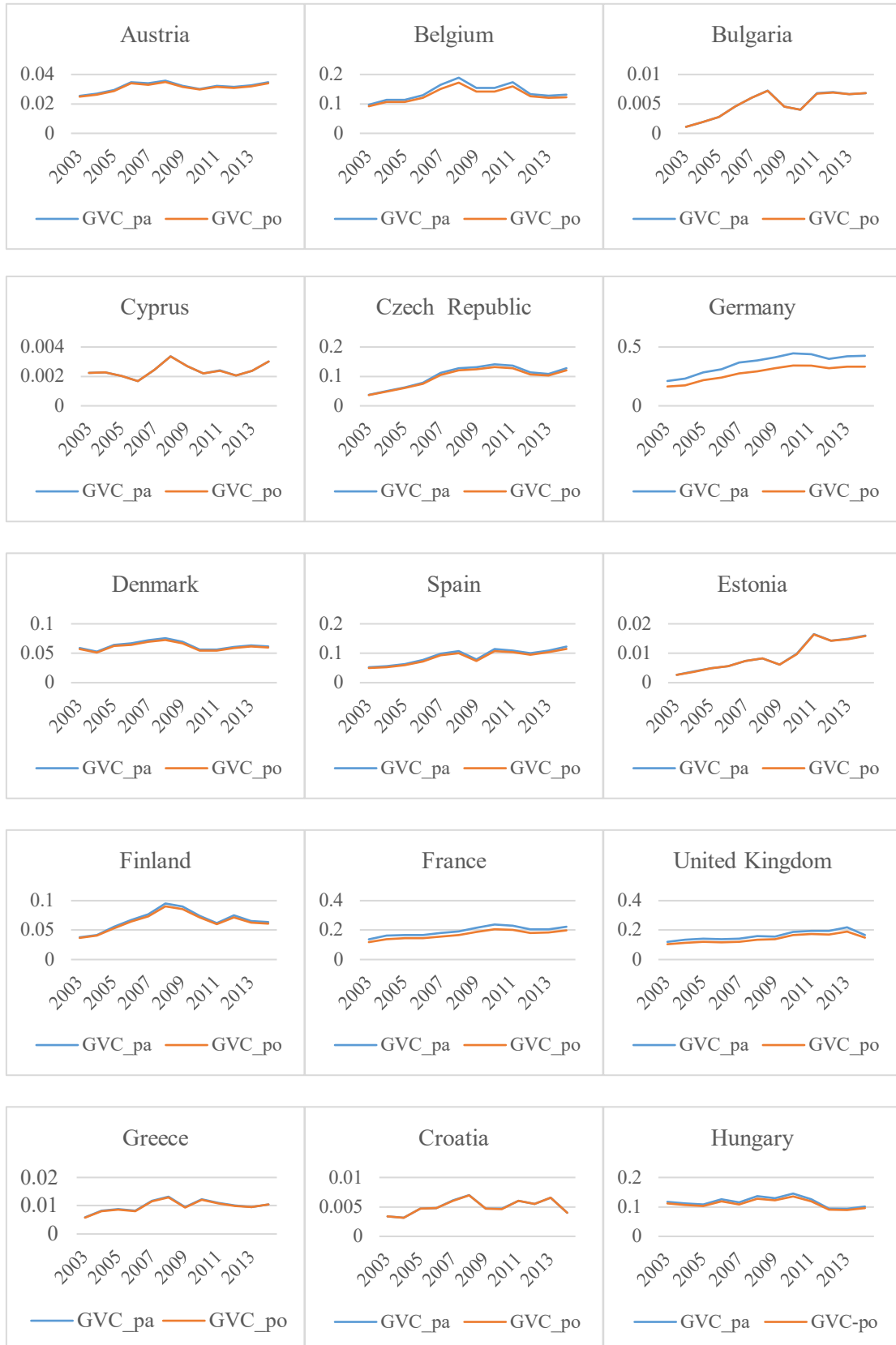
The dynamic evolution of the bilateral value chain cooperation index and the relative position index between China and the 28 member states of the European Union (EU) from 2003 to 2014, as depicted in Figure 1, showcases a series of profound and systematic trends that reflect the intricacies of global economic integration and the unique economic interplay between China and the EU.

Firstly, an overarching trend reveals a consistent increase in the degree of bilateral value chain cooperation and the relative division of labor status between China and most EU member states, despite fluctuations. This trend underscores the ever-tightening economic ties between China and EU countries, as well as the strengthening synergy in global value chains (GVCs), jointly driving the optimization and upgrading of the global production network. Notably, despite the 2008 global financial crisis that briefly

disrupted the level of bilateral value chain cooperation and the relative division of labor between China and EU nations, a swift recovery ensued, maintaining the upward momentum. This phenomenon attests to the resilience of the global economic system and underscores the profound foundation and stable relationship in GVC cooperation between China and EU countries. Cooperation with economically formidable EU nations such as Germany, France, the United Kingdom, and the Netherlands remained steadfastly on an upward trajectory even during the crisis, further validating the robustness and risk resilience of their division of labor in GVCs.

Moreover, Figure 2 highlights disparities in the degree of value chain cooperation and relative division of labor positions between China and individual EU countries. Specifically, China's bilateral value chain cooperation and relative position with a few countries, like Ireland and Luxembourg, exhibit a declining trend. This disparity may stem from a confluence of factors, including but not limited to economic structural differences, trade policy adjustments, and the restructuring of GVCs.

In summary, the years from 2003 to 2014 witnessed significant changes and advancements in China-EU cooperation and division of labor within GVCs. The bilateral cooperation between the two parties intensified, and China's position in the GVC relative to EU countries improved. This trend reflects the deepening and expansion of global economic integration, opening up vast opportunities for future economic cooperation between China and the EU. Furthermore, amidst global economic fluctuations and challenges, robust cooperation and mutual support between China and the EU become increasingly crucial. In the future, both parties should continue to enhance communication and collaboration, jointly addressing the challenges and seizing the opportunities presented by global economic changes, thereby promoting the continuous optimization and upgrading of GVCs.



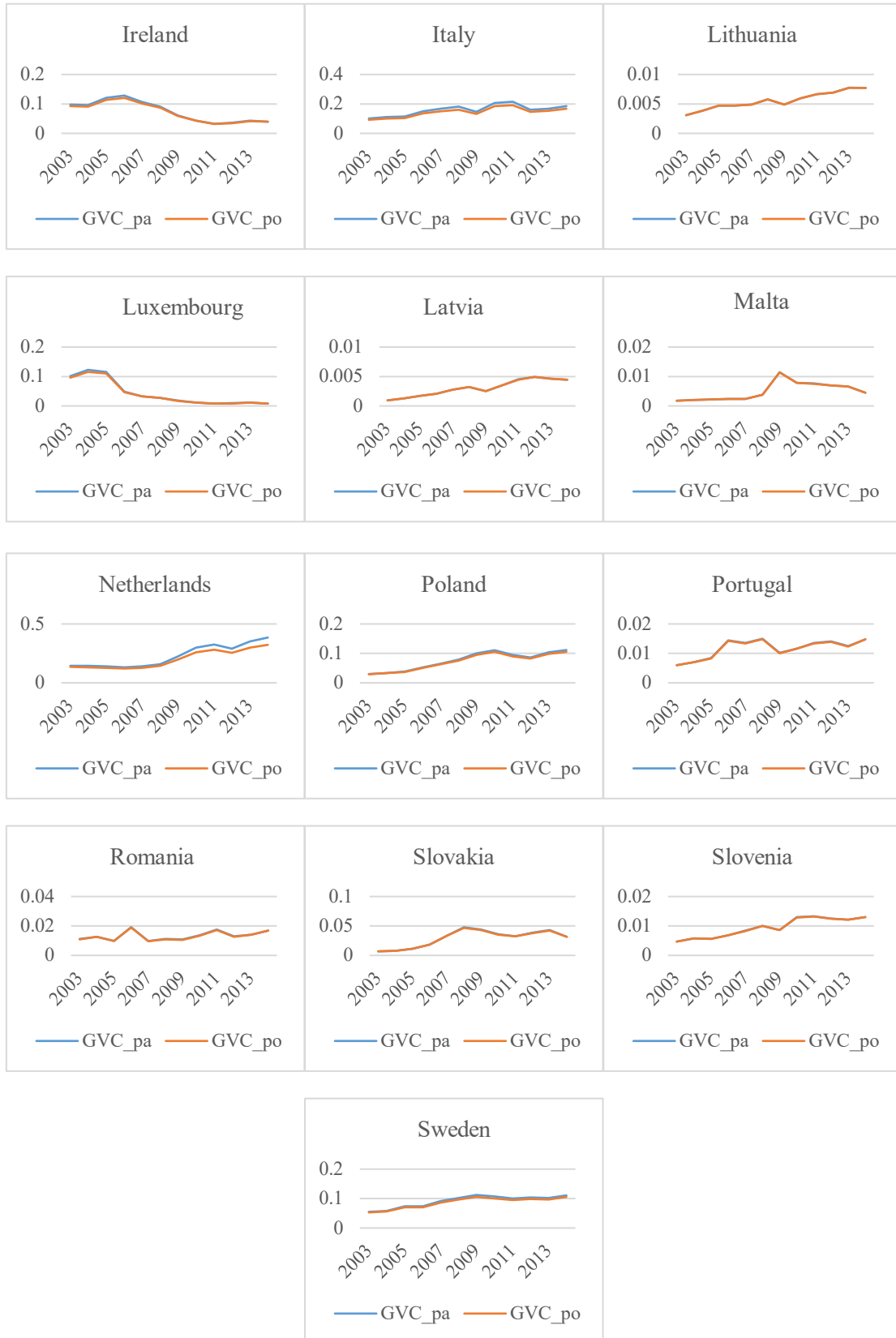


Figure 1: Trends in the Bilateral Cooperation Index and Relative Position Index between China and the 28 Member States of the European Union from 2003 to 2014.

4. Conclusion

This paper, from the perspective of the Global Value Chain (GVC), provides an in-depth analysis of the dynamic characteristics and evolutionary trends in the trade relations between China and EU countries from 2003 to 2014. By constructing two core indicators—the Bilateral Value Chain Cooperation Index and the Relative Position Index within the Value Chain—it delves into the dynamic evolution of cooperation between China and EU countries within the GVC, revealing the deepening of cooperation and changes in roles amidst global economic integration. Furthermore, it illuminates the complexities and diversities inherent in the structural adjustments of the GVC. These conclusions not only offer a novel perspective on understanding regional economic cooperation and the dynamic adjustments of the GVC but also serve as a crucial reference for guiding future practices in regional economic cooperation and global governance. The key findings are as follows:

(1) During the study period, the Bilateral Value Chain Cooperation Index between China and EU member states significantly increased, indicating an expanding depth and breadth of cooperation within the GVC. This trend was evident across most member states, particularly pronounced in cooperation with Central and Eastern European countries, reflecting China's gradually expanding influence within the GVC.

(2) The consistent and notable rise in the Relative Position Index within the Value Chain underscores China's steadily ascending position in the GVC division of labor. This shift not only mirrors China's achievements in industrial upgrading and economic development but also signifies a positive transformation of its role within the GVC, moving from traditional low-value-added production segments to higher-level, more competitive domains.

(3) The study also uncovered significant disparities in EU member states' participation in the GVC. Developed countries such as Germany and France actively engage in the GVC division of labor by supplying high-quality intermediate goods, thereby generating substantial value added. In contrast, some

Eastern European countries exhibit lower levels of GVC participation, often functioning as "ancillary capacities." This revelation underscores the complexity of the EU's internal economic structure and its varied impacts on the GVC.

(4) Despite challenges like the global financial crisis, the GVC cooperation between China and EU countries has demonstrated remarkable resilience and stability, showcasing a unique interdependence. This trend reflects the resilience of the global economic system and underscores the profound foundation and robust relationship underpinning China-EU GVC cooperation. As the global economy continues to develop and the international division of labor deepens, the evolving cooperation and competition between China and EU countries within the GVC will continue to exert profound influences on both parties and the global economy.

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Appendix

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MS0131: Award-Winning Brand Creative Strategies: A Comparative Analysis of Experimental Technologies and Their Impact on Gen Z's Behavioral Intentions in Asian and Western Markets

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Award-Winning Brand Creative Strategies: A Comparative Analysis of Experimental Technologies and Their Impact on Gen Z's Behavioral Intentions in Asian and Western Markets

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Extended Abstract

This study explores how experimental technologies, originally not designed for advertising, are integrated into brand campaigns, focusing on brand creative strategies and Gen Z consumer psychology. Comparing award-winning strategies from Asian and Western markets, it reveals that both regions often employ experimental technologies for non-tech products, primarily to evoke emotional responses. However, Western agencies more frequently combine emotional and rational appeals. The introduction of experimental technology significantly increases Gen Z's purchase intentions, with "brand creative trait" identified as a key mediator. Yet, the perceived distance of experimental technology does not further enhance purchase intentions.

Keywords: Experimental Technology, Creative Brand Strategies, Purchase Intentions, Awards, Creativity, Brand Creative Trait

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1. Introduction

With the rise of digital media and AI-driven personalization, advertising has been transformed, especially in how experimental technologies are integrated into creative strategies. AI allows brands to analyze consumer data in real time, enabling more precise targeting and personalization in international marketing strategies. This has become critical for reaching Generation Z, who value innovation and novelty. In the global landscape, brand creative strategies are key to differentiating brands and adapting to diverse consumer behaviors. This study compares how award-winning brand strategies from Asian and Western markets use experimental technologies and how these technologies influence Generation Z's purchase intentions. A central concept is the “brand creative trait,” which refers to a brand's perceived creativity and ability to innovate. In international marketing, brands that effectively use experimental technologies are seen as more daring and creative, enhancing consumer perceptions and purchase behavior across global markets. Drawing on the Social Construction of Technology (SCOT) theory, which explains how technologies adapt to social contexts, this study examines how creative strategies evolve across international markets. By exploring the role of AI, technology, and culture, this research offers insights into how experimental technologies drive consumer engagement, particularly among digitally-native Generation Z consumers. These creative strategies, empowered by AI, are critical for the success of international marketing strategies.

2. Literature and framework:

2.1. Brand Creative Strategies

The use of creativity in advertising has long been a focus of research, with several models attempting to capture the key elements that define effective creative strategies. Koslow, Sasser, and Riordan propose a conceptual model of creativity that includes three dimensions: originality, strategy,

and artistry (Campbell et al., 2022). Originality emphasizes the novelty of ideas, strategy ensures the relevance and appropriateness of the message, and artistry highlights the aesthetic and expressive aspects of the ad. These dimensions form the foundation for evaluating creative brand strategies. Incorporating the Dual-Process Theory of Creativity, proposed by Sawyer provides further insight into the cognitive mechanisms involved in the creative process (Ameen et al., 2022). This theory divides creativity into two cognitive processes: associative (which leads to novelty) and cognitive control (which evaluates the feasibility and appropriateness of creative ideas). Both perspectives underline the importance of balancing novelty with relevance to craft impactful advertising campaigns.

In the context of this study, the introduction of experimental technologies—technologies not originally intended for advertising purposes—adds a new layer of complexity to creative strategies (see Figures 1 & 2). By using such technologies, brands can enhance their brand creative trait, which is perceived as the brand's capacity to challenge norms, take risks, and innovate. This trait significantly affects how consumers respond to advertising, particularly for Generation Z, who value innovation and novelty.

2.2. Consumer Psychology:

From the perspective of consumer psychology, emotional and cognitive responses to advertisements play a critical role in shaping consumer behavior (So et al., 2024). The affective response, driven by emotional engagement, and the reactive response, which is more rational and focused on call-to-action, are key elements of how consumers evaluate advertising (Ding et al., 2024). For Generation Z consumers, who are highly attuned to digital experiences, the use of experimental technology in advertisements can evoke strong emotional reactions, influencing their purchase intentions. Previous research suggests that these consumers respond positively to brands that exhibit

creativity and innovation, which enhances their emotional connection to the brand (Southgate, 2017).

This study introduces the “brand creative trait” as a mediator in the relationship between experimental technology and consumer purchase intentions. Brands that successfully integrate experimental technologies into their campaigns are perceived as more creative, which in turn enhances consumer loyalty and increases the likelihood of purchase.

2.3. Research Questions

Based on these theoretical perspectives, the following research questions are proposed to guide the study:

RQ1. Are award-winning brand creative strategies developed in Asia used in different ways than those developed in Western markets?

RQ2. Are award-winning brand creative strategies developed in Asia intended to elicit different consumer responses (affective vs. reactive) compared to those developed in Western markets?

RQ3. Among the award-winning brand creative strategies analyzed, what specific product categories are most often represented in the Asian and Western markets, respectively?

RQ4. What specific experimental technologies are most frequently employed by Asian versus Western agencies?

RQ5. How does the presence of experimental technology in brand strategies foster greater purchase intention among Generation Z consumers, and what are the underlying mechanisms driving this effect?

RQ6. Does perceived brand creative trait serve as the mediating mechanism between the use of experimental technology and consumer purchase intentions?

RQ7. How does the perceived distance of experimental technology (close vs. far-away) as applied

in brand creative strategies influence consumer purchase intentions?

3. Methodology and Results

This research comprises three studies that examine the use of experimental technologies in brand strategies across Asian and Western markets, focusing on their impact on consumer behavior, particularly Generation Z. Each study explores different aspects of how these technologies shape consumer responses and influence purchase intentions.

3.1. Study 1: Content Analysis of Award-Winning Strategies

In the first study, a content analysis was conducted on 182 award-winning advertising strategies from four major Asian advertising awards—Ad Star, Spikes Asia, Asia Pacific Advertising Festival, and The One Show China—covering the period from 2013 to 2015. These Asian strategies were then compared to 858 award-winning strategies from Western award programs, including Cannes Lions and Clio Awards, during the same time frame. The analysis examined three key variables: the product category, the presence of experimental technology, and the type of consumer response intended, whether affective (emotional) or reactive (rational).

The results (see Tables 1 & 2) indicated that both Asian and Western markets predominantly used experimental technologies to promote non-technology-related products, with no significant difference in strategy use between the regions, addressing the first research question (RQ1). In terms of consumer responses (RQ2), both markets focused on eliciting affective responses, though Western strategies were more likely to trigger reactive responses, demonstrating a blend of emotional and rational appeals. Regarding the third research question (RQ3), consumer services accounted for 87% of the product categories in Asian strategies, while Western strategies featured a more balanced representation across consumer services, packaged goods, and durable goods. Finally, the fourth research question (RQ4)

revealed that Asian strategies tended to favor mapping/navigation and motion detection technologies, while Western strategies used more image OCR and virtual reality technologies (see Tables 3 & 4).

3.2. Study 2: Experimental Technology's Impact on Purchase Intentions

The second study involved a between-subjects experiment designed to test how the presence of experimental technology affects consumer purchase intentions, particularly among Generation Z. A total of 198 participants, with an average age of 24.2, were randomly assigned to one of two conditions: one group viewed product promotional scenarios with experimental technology integrated into the message, while the control group viewed the same product information without the technology.

The results showed that the presence of experimental technology significantly increased consumer purchase intentions, with participants in the experimental technology condition reporting higher intentions to purchase the product ($M = 6.18$) compared to those in the control condition ($M = 5.67$), confirming the fifth research question (RQ5). Moreover, participants exposed to experimental technology perceived the brand as more creative ($M = 6.18$) than those in the control group ($M = 5.06$), with the results of a mediation analysis supporting the sixth research question (RQ6). This analysis revealed that the brand creative trait acted as a mediator between the use of experimental technology and purchase intentions, suggesting that technology enhances the perception of a brand's creativity, which in turn increases the likelihood of purchase.

3.3. Study 3: Perceived Distance of Experimental Technology and Consumer Behavior

The third study focused on the perceived distance of experimental technology—whether consumers viewed the technology as close or far away from the brand's industry—and its effect on consumer purchase intentions. A total of 200 participants, with an average age of 25.1, were randomly assigned to either a close-distance or far-away-distance technology scenario. Participants were exposed to

promotional content describing the use of experimental technology and then completed a survey measuring their purchase intentions and perception of the brand's creative trait.

The results showed no significant difference in purchase intentions between close-distance and far-away-distance technologies, addressing the seventh research question (RQ7). While the perceived distance of the technology did not directly influence purchase intentions, the perceived brand creative trait remained a critical factor in shaping consumer behavior. This finding suggests that while novelty and technological distance alone may not drive purchase decisions, the integration of technology that aligns with the brand's identity and enhances its creative trait can still positively impact consumer engagement (see Figure 3 & 4).

4. Discussion

The study highlights key differences in how Asian and Western markets integrate experimental technologies into advertising. Asian campaigns often emphasize emotional connections, aligning with cultural preferences for social harmony. On the other hand, Western strategies tend to balance emotional and rational appeals, aiming for a broader consumer impact. The introduction of the concept "brand creative trait" provides valuable insights into how brands leverage experimental technologies to enhance their perceived creativity. The study found that incorporating experimental technologies significantly increases Generation Z's purchase intentions, mediated by the brand's creative trait.

Advertising practitioners should consider incorporating experimental technologies to create more unexpected and memorable campaigns, particularly for non-technology-related products. Staying informed about emerging technologies from diverse industries can offer new creative opportunities.

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Appendix A

Table 1

Examined Award Categories

Award Shows (Western Market)	Examined Award Categories
Cannes Lions Awards	Branded content Entertainment Cyber Innovation
ADC Awards	Interactive
ADDY Awards	Digital advertising Integrated campaigns Non-traditional
ANDY Awards	Branded content Creative technology Integrated and mobile
Clio Awards	Branded entertainment & content Digital social Engagement Innovative media
D&AD Awards	Integrated & earned media Mobile marketing
LIA Awards	Branded entertainment Digital Integration Non-traditional
One Show	Branded entertainment Interactive
Award Shows (Asian Market)	Examined Award Categories
Ad Star	Branded Content Innovation Integrated Interactive Interactive Craft Mobile
Spikes Asia	Branded Content Digital Integrated Mobile
Asia Pacific Advertising Festival	Interactive Mobile
One Show China	Branded entertainment Social Media Mobile

Table 2

Chi-Square Test Results

Variables		N	Proportion	χ^2	Sig
Asian Strategies		49	71.0		
Western Strategies	Non-technology-related products	72	72.7	.059	.48
Asian Strategies		69	100		
Western Strategies	Affective Response	97	98	1.41	.346
Asian Strategies		11	15.9		
Western Strategies	Reactive Response	36	36.4	8.42	.003

Table 3

Frequencies for Product Type

	Product Type	Frequency	Percent
	Packaged Goods	4	5.8
Asian Strategies	Durable Goods	5	7.2
	Consumer Services	60	87.0
	Packaged Goods	30	30.3
Western Strategies	Durable Goods	24	24.2
	Consumer Services	45	45.5

Table 4

a. Frequencies for Asian Strategies

Technology Type	Frequency	Percent
Motion Detection: i.e. gyroscope	10	5.1
Manufacturing Technology: i.e. ultra sonic sensors	0	0
Gaming	2	1.0
Mapping/Navigation Technology: i.e. navigation tools	13	6.6
Telecommunication/Radio Broadcasting/Sound Technology: i.e. pirate radio	11	5.6
Image Scanning/OCR character recognition technology	9	4.5
Math: i.e. math modeling	1	.5
Engineering: i.e. RFID sensors	1	.5
Filming/Animation	3	1.5
Web Technology/Virtual Reality Technology/Interactive Technology	3	1.5
Meteorology: i.e. weather sensors	0	0
Optical Fabrication Technology: i.e. 3-D printing	10	5.1
Computer Software Technology: i.e. computer aided 3D sculpture	2	1.0
Sports: i.e. space jump	1	.5
Lie Detection: i.e. polygraph	0	0
Wearable Technology: i.e. live data converting shirt	0	0
Purification Technology: i.e. air purification technology	0	0
Medical Technology: i.e. brain wave technology	1	.5
Chemical Technology: i.e. fade ink	2	1.0

b. Frequencies for Western Strategies

Technology Type	Frequency	Percent
Motion Detection: i.e. gyroscope	9	9.1
Manufacturing Technology: i.e. ultra sonic sensors	3	3.0
Gaming	3	3.0
Mapping/Navigation Technology: i.e. navigation tools	11	11.1
Telecommunication/Radio Broadcasting/Sound Technology: i.e. pirate radio	6	6.1
Image Scanning/OCR character recognition technology	18	18.2
Math: i.e. math modeling	4	4.0
Engineering: i.e. RFID sensors	8	8.1
Filming/Animation	3	3.0
Web Technology/Virtual Reality Technology/Interactive Technology	15	15.2
Meteorology: i.e. weather sensors	2	2.0
Optical Fabrication Technology: i.e. 3-D printing	4	4.0
Computer Software Technology: i.e. computer aided 3D sculpture	6	6.1
Sports: i.e. space jump	1	1.0
Lie Detection: i.e. polygraph	1	1.0
Wearable Technology: i.e. live data converting shirt	1	1.0
Purification Technology: i.e. air purification technology	1	1.0
Medical Technology: i.e. brain wave technology	3	3.0
Chemical Technology: i.e. fade ink	0	0

Figures

MUSIC. WE KNOW IT COMES FROM EVERYWHERE.

Challenge
Billboard Magazine is an authority when it comes to music. So it's up to us to show the world that music comes from everywhere.

Idea
The Guitar Pee is a mix between men's urinal and an electric guitar, allowing guys to create unique riffs while emptying their bladder. After they are done, each guitarist can listen and download his recent-recorded "mpees" by accessing the Guitar Pee Gallery via mobile.

Results
The Guitar Pee has toured several bars in São Paulo, registering over 1,500 unique guitar riffs (and counting). But more than this, it has proved that music does come from everywhere.

Billboard MAGAZINE

Please watch the video

LISTEN TO YOUR OWN MPEES

1 MAKE YOUR SOLO
2 CHOOSE THE TONE
3 PRESS STRINGS
4 CHASE TO IT

msn now HUFF POST 9GAG FOX NEWS channel

Buzz Feed THE RAW STORY

1645

Figure 1. Billboard's guitar pee campaign.

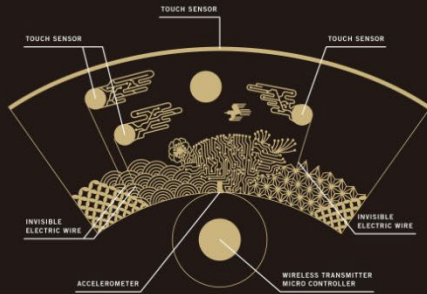
Experimental technology type: sound transmission
Original technology application field: sound technology

HIBIKI GLASS

- TASTE THE SEASONS -

Sanitry HIBIKI which means "Harmony" is one of the best known blended whisky's in Japan. Sanitry wants to share with the world HIBIKI's uniqueness and craftsmanship of Japanese blended whisky born from a fusion of tradition and innovations. We created the world's first interactive whisky glass made of innovative sensor technology incorporating traditional Japanese design. The invention of this brand new whisky glass, made of electric circuits reflecting the four seasons, is made in collaboration with traditional craftsmen and digital technologists. Interacting with the glass, by touching it, tilting, drinking, swirling the ice cubes creates unique seasonal experiences incorporating audio & visual effects. The glass affords people a new way of experiencing whisky with 5 senses. This experience is filmed and Japanese whisky speaks its branding story - perfect harmony made by blending the unique elements of the four seasons, such as water, wheat and oak barrel. It was filmed and in response to public demand, Harmony Bar events are held in Tokyo and many people experienced the harmony of tradition and innovation, the harmony of four seasons, and the harmony of blended taste of HIBIKI.

GLASS MECHANISM



HARMONY BAR

The bartender selects the season, then each glass plays various seasonal sound and visual according to the user's action. The sound effect can be harmonized.



Figure 2. Hibiki Glass.

Experimental technology type: 3-D printing

Original technology application field: optical fabrication technology

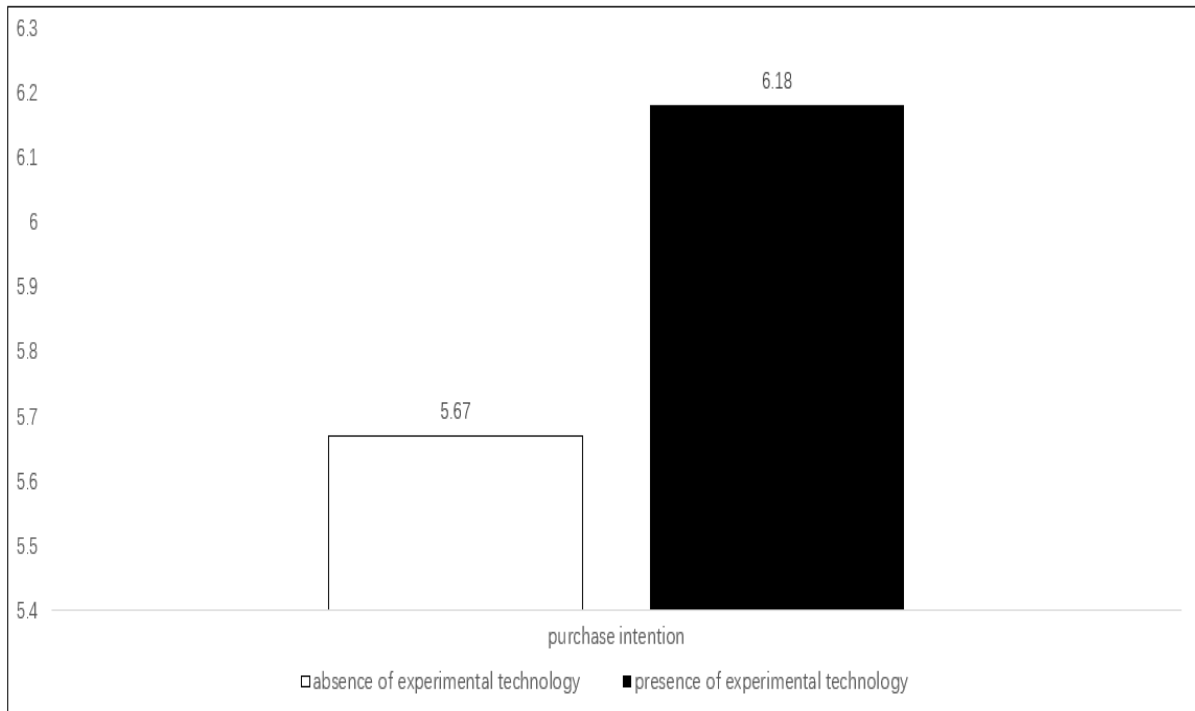
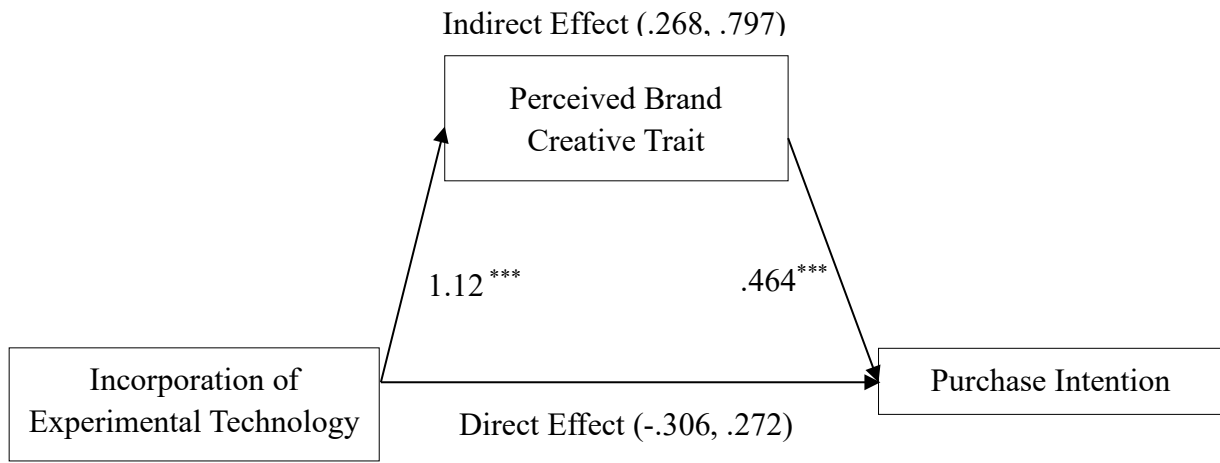


Figure 3. Main Effects.



* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 4. Index of Mediation Framework

MS0132: Investors' Valuations and CM&As by Chinese Listed Firms under the Belt and Road Initiative

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Investors' Valuations and CM&As by Chinese Listed Firms under the Belt and Road Initiative

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Abstract

Using Chinese listed firms' data from 2014 to 2022, this study investigates whether firms' cross-border mergers and acquisitions (CM&As) in Belt and Road countries positively affect investors' valuations and what gives rise to the performance implications. Our analysis suggests that CM&As can signal the firm's political affinity to the market, which gives rise to a positive investment performance nexus. Our findings provide a new perspective on understanding firms' investment motivations and investors' valuations in emerging markets.

Keywords: Belt and Road Initiative (BRI), Cross-border Mergers and Acquisitions (CM&As), Investors' Valuations, Political Affinity

Investors' Valuations and CM&As by Chinese Listed Firms under the Belt and Road Initiative

Abstract

Using Chinese listed firms' data from 2014 to 2022, this study investigates whether firms' cross-border mergers and acquisitions (CM&As) in Belt and Road countries positively affect investors' valuations and what gives rise to the performance implications. Our analysis suggests that CM&As can signal the firm's political affinity to the market, which gives rise to a positive investment performance nexus. Our findings provide a new perspective on understanding firms' investment motivations and investors' valuations in emerging markets.

Keywords: Belt and Road Initiative (BRI), Cross-border Mergers and Acquisitions (CM&As), Investors' Valuations, Political Affinity

1. Introduction

Amid rising protectionism and deglobalization, which were intensified post-COVID-19 (Ciravegna & Michailova, 2022), the Belt and Road Initiative (BRI) is one of the few schemes spurring firms to expand and invest internationally (Li et al., 2022). The BRI is a state-level initiative that was extensively promoted by Chinese President Xi Jinping in 2013, and it is one of the major international programs of the 21st century (Buckley, 2020). In the BRI scheme, the Chinese government supports firms to “go abroad” and attract new demand from new markets (Li et al., 2019). The success of projects in Belt and Road countries is crucial because it will affect how the BRI and the Chinese government are perceived internationally. Ferdinand (2016) suggests that BRI is not only a guide for policy but also entails various financial incentive like subsidies. If Chinese firms invest in Belt and Road countries, they are likely to receive financial support, including that from traditional international financial systems (e.g., World Bank and Asian Development Bank), developmental and political financial institutions (e.g., Asian Investment Bank, China Development Bank, and Export-Import Bank), commercial banks, special investment funds, and emerging multilateral development financial institutions¹. It is not surprising that since its launch in 2013, the number of Chinese firms’ cross-border mergers and acquisitions (CM&As) in Belt and Road countries has increased significantly (Du & Zhang, 2018).

¹ Source: <https://www.yidaiyilu.gov.cn/>

CM&A is a critical event in a firm's lifecycle, substantially affecting its operations and activities. The literature has accumulated mixed results regarding the performance impact of CM&As. Some studies find positive effects of CM&As (Du & Boateng, 2015; Gaur et al., 2013; Tao et al., 2017) whereas other find negative effects in the short term (Aybar & Ficici, 2009; Chen & Young, 2010). In the long term, Renneboog and Vansteenkiste (2019) argue that most studies provide evidence of negative or non-significant returns, such as King et al. (2004) and Bessembinder and Zhang (2013). A general explanation about the negative or non-significant effects is that the markets slowly adjust to takeover news, which means the actual value of an acquisition will show over time (Renneboog & Vansteenkiste, 2019). In this study, we focus on Chinese firms' CM&As in Belt and Road countries and examine its short-term and long-term impact on firm's performance.

We conduct our analysis by collecting Chinese listed firms' financial data and CM&As information from China Stock Market and Accounting Research (CSMAR) database to evaluate whether the short-term and long-term positive impact of CM&As in Belt and Road countries on investors' valuations is causal. First, we focus on the short-term effect by employing the event study method (ESM) and find a positive cumulative abnormal return (CAR). Moreover, the above positive effects are stronger for non-state-owned enterprises (non-SOEs), indicating the signal value of CM&As in Belt and Road countries is more relevant to non-SOEs as they have less credible instruments to signal their political affinity to the government. The effects are also stronger for firms located in core provinces, which can access more support from the

central government. Second, we focus on Tobin's Q to evaluate the long-term effect by combining propensity score matching (PSM) with difference-in-differences (DID) analysis and find positive effects of CM&As on firm's Tobin's Q. Third, to eliminate the possibility that the positive valuations may stem from CM&As rather than CM&As in Belt and Road countries, we compare Tobin's Q of firms engaging in CM&As in Belt and Road countries and those undertaking CM&As in other countries. We find that the former exhibit higher investors' valuations than the latter. Fourth, we compare the impact of firms' greenfield investments with that of CM&As in Belt and Road countries based on the rationale that firms have more flexibility to scale up or down their greenfield investment compared to CM&As deals. The inherent inflexibility of CM&As deals renders them more credible signals than greenfield investments. Our analysis confirms this conjecture that greenfield investments do not generate positive investors' valuations. Taken these results together, our findings suggest that firms' CM&As in Belt and Road countries serve as a signal of political affinity and account for the positive investors' valuations.

Our study offers the following contributions. First, we integrate signaling theory and political affinity view, and provide new evidence on the positive relationship between firms' CM&A and investors' valuations in the context of the BRI. Our findings demonstrate that such CM&As positively affect firms' short-term and long-term performance. Specifically, firms leverage CM&As in Belt and Road countries to signal their strategy aligning with the policy of the Chinese government. Considering the benefits that such signal may afford to those firms,

external investors interpret these costly CM&As as credible commitment and are more confident in those firms and more likely to invest in them. In doing so, we introduce a new signal, which is valued by the markets and also complements the various signal values conveyed by firms' investment strategies in extant studies (Schijven & Hitt, 2012).

Second, although BRI has been proposed for ten years, there is limited research about it, especially at this time of rising anti-globalization sentiments (Li et al., 2022). Besides seeking resources from the host countries (Mauro & Esteban, 2009), this research provides an alternative perspective on understanding why Chinese firms invest abroad, which is to seek political affinity with the Chinese government and gain political capital. It provides a political lens to understand firms' motivation for CM&As in emerging markets, which has increasing currency to the Chinese as well as the world economy.

The remainder of this paper is organized as follows. In Section 2, we introduce relevant theory and develop our hypotheses. In Section 3, we present the data sources. We report the analysis results in Section 4 and 5. Section 6 concludes.

2. Theory and Hypothesis

2.1. Signaling Theory

Firms possess superior knowledge of their capabilities, whereas external investors often lack access to this information, leading to information asymmetry. Consequently, it is critical for

firms to effectively convey their capabilities to external investors to reduce information asymmetry. In this case, signaling theory is gaining attention as a framework for understanding how stakeholders deal with informational challenges to make choices that align with their goals (Bergh et al., 2014). Scholars have revealed several signals in acquisition studies. King et al. (2004) find that the method of payment can serve as a signal. When an acquirer uses its equity as payment, it signals a belief that the stock is overvalued, which leads to a negative reaction from the stock market. Zhang et al. (2022) find that corporate social responsibility (CSR) engagement prior to an acquisition announcement can serve as a credible signal indicating the firm's altruism, thereby mitigating negative investor reactions, as continuous CSR engagement helps prevent suspicion from external investors that the firm is employing a window-dressing strategy. Despite these findings, previous studies related to signaling theory in acquisition studies shed little light on whether signals of political affinity conveyed through CM&As can positively influence investor valuations.

2.2. Political Affinity View

A firm's political connectedness which is a connection between the firm and government is the main composition of political strategies in developed and developing countries (Hillman, 2005; Hillman et al., 1999; Peng & Luo, 2000). Over forty percent of listed firms in China had top executives owning political posts in the past (Cheng et al., 2017). The political connection between government and firms is a form of "political capital," which tends to safeguard firms' access to scarce assets. Through obtaining information, influence, and legality, firms could

buffer market competition and regulatory force (Hillman, 2005; Hillman et al., 1999; Lester et al., 2008; Peng & Luo, 2000). Mellahi et al. (2016) note that firms can use their political capital to protect themselves from harmful political intervention, unfavorable regulation, or various types of rent requisition by the government. Even in the United States, political connections have been shown to help firms deal with regulators (Correia, 2014; Yu & Yu, 2011). In emerging markets, the buffer effect is an effective mechanism to protect firms from the government's rent requisition behavior (Chen et al., 2011; Dieleman & Boddewyn, 2012). Besides that, firms that have political connections can circumvent financial difficulties resulting from unexpected bank liquidity crises by securing loans with favorable financial terms. In contrast, firms lacking political connections face substantial reductions in their overall borrowing capacity during such shocks (Khwaja & Mian, 2008).

The Chinese government is an important source of resources and legality (Zhang et al., 2016). It keeps the rights of allocating resources and licenses, approving programs, allocating subsidies, allowing delinquent taxes, and providing rights to use infrastructure (Shi et al., 2014). Political affinity can benefit companies by facilitating favorable access to government contracts (Goldman et al., 2009; Schoenherr, 2019), providing financial resources (Cull & Xu, 2003; Dinc, 2005; Johnson & Mitton, 2003), and offering low-cost bank loans (Houston et al., 2014; Infante & Piazza, 2014; Khwaja & Mian, 2005). When the connected firm faces insolvency, they are more likely to receive bailouts from government (Faccio et al., 2006), and have higher survival probability (Akcigit et al., 2023). Meanwhile, the firm's legitimacy, the financial

bottom line (Hillman et al., 1999), credit worthiness (Houston et al., 2014), and the firm's value will also increase (Fisman, 2001). Croci et al. (2017) suggest that the valuation of politically connected firms includes a unique "political" component, distinguishing them from otherwise similar firms that lack political involvement. Faccio (2006) uses the event study analysis to investigate how a firm's stock prices change when corporate executives hold government positions, and the result shows that the connection significantly increases the firm's value. In general, the connection with the government is essential for firms' survival, and firms could use it to advance private ends, including getting a voice in government affairs and bolstering economic positions (Hillman & Hitt, 1999; Li & Zhang, 2007; Peng & Luo, 2000).

2.3. Hypothesis Development

Unlike many other Western countries, the Chinese Communist Party is the largest and only ruling party in China. Although viewed unfavorably from a democratic point of view, the dominance of the singular ruling party facilitates executions of government policies and long-term plans. In 2013, one year after the new Chinese President Xi Jinping came to power, he proposed "BRI," a new version of the "go abroad" initiative in 1999. It encourages firms to participate in the initiative and go abroad actively.

Meanwhile, since 2013, the Chinese government prohibited current officials from holding positions in firms, eliminating direct government-firm connections, such as dual roles of some key personnels in both government and business. This regulatory change eliminated the

opportunity for Chinese listed companies to build ties with the government by appointing independent directors (Fu & Sun, 2023). Although the policy aimed at cracking down corruption, it also increased information asymmetry for external investors who could no longer discern firms' political connections via their personnels. Therefore, firms would seek to signal to the market with alternative means, that is by responding to the government's specific policies. The BRI serves as a governmental cue, offering firms an opportunity to forge strong connections with the government. Marquis and Qian (2014) note that such governmental cues are a significant way of exerting political influence, shaping firms' legitimacy.

Considering the potential to enhance reputation and legitimacy domestically, Chinese firms respond to government cues by engaging in appropriate activities and connecting with the government through participation in Belt and Road countries. From a political affinity perspective, strategic political management involves corporate actions aimed at maximizing economic benefits within the political environment (Oliver & Holzinger, 2008). By aligning with the BRI, firms could gain competitive advantages or protection. This alignment helps maintain legitimacy by adhering to established orders, following rules, and aligning with national strategic development goals. Additionally, potential future government incentives such as subsidies can help firms address resource shortages for international expansion, hedge against transaction risks, and boost their international competitiveness (Luo et al., 2010).

Like signaling the firm's commitment toward the environment by issuing green bonds (Flammer, 2021), Chinese firms can signal their political affinity with the government by CM&As in Belt and Road countries. We suggest conducting CM&As in Belt and Road countries meets signal's two conditions based on the signaling theory: (1) the CM&A is costly, and "low-quality" firms would find it hard to mimic. (2) the external investors could capture the information from the firm's announcement, i.e., the CM&A is observable. Although external investors could not ascertain whether political connection will be materialized, the costly nature of the CM&A make it credible. In sum, the announcement of CM&As in Belt and Road countries can serve as a credible signal of a firm's commitment to political affinity and effectively mitigates information asymmetry. Consequently, external investors may have a more positive view of the firms' development trajectories and more likely to invest in them. We propose the following hypothesis:

Hypothesis: The firm's CM&As signaling political affinity will positively affect the investors' valuations.

3. Firm-level Data

3.1. Data Sources

We collect the CM&As information of Chinese A-share listed firms from 2014 to 2022. Chinese President Xi first proposed BRI in September 2013, so our study period started in 2014. The year 2022 is the last update of the database when we write this article. The data is obtained from

CSMAR database, which has been widely used in corporate finance and governance studies (Marquis & Qian, 2014; Zhang et al., 2016). CSMAR database provides detailed information about CM&As that occurred in Belt and Road countries, and it includes the date of announcement, the firms involved in the transaction, and the names of the host countries. There are several criteria that we follow to construct our sample. First, we only consider firms' first CM&A in Belt and Road countries after proposing BRI, and this method has been utilized generally (Schweizer et al., 2019). Second, we excluded financial firms because of their different financial statements. Third, we excluded firms marked as Special Treatment (ST) by the Shanghai or Shenzhen Stock Exchange as these firms experienced abnormal financial status or other abnormal events, which leads to the risk of ending the listing of their stocks. The final data has 233 CM&As in Belt and Road countries, which is depicted in [Figure 1](#). The country and industry distribution of CM&As in Belt and Road countries is displayed in Appendix Table I and II², respectively.

To estimate investors' short-term valuations, we collect stock market data including daily market return and each firm's daily return from CSMAR database. To estimate long-term investors' valuations, we follow previous studies and use Tobin's Q (Hasija et al., 2020; Huang et al., 2017; Zollo & Meier, 2008). Tobin's Q is the market-based measure, and it is the market value of assets divided by the book value of assets (Tobin, 1969). Compared with accounting-based measure, it has the advantage of capturing not only short-term but also long-term

² We use the two-digit industry classification, which was classified by the China Securities Regulatory Commission (CSRC) in 2012.

performance effects (Allen, 1993). Tobin's Q also includes a firm's market value which includes value-added and could reflect external investors' reaction directly. Additionally, Tobin's Q combines a firm's financial market data with accounting data, making it possible to estimate firm rents accurately. When capital markets are used to value rents, it could reduce the limitations in accounting profit rates. The benefits of relying on capital markets include incorporating a firm's risk, providing a valuation of rents that aligns with market equilibrium, and minimizing the distortions caused by tax laws or accounting standards (Smirlock et al., 1984). Other variables that we use to estimate Tobin's Q are ROA, Liability, Size, Firm Age, Experience, HHI, Z Score, Largest Holder Rate, Top Ten Holders Rate. Experience, HHI and Z Score indicate a firm's previous CM&A experience, Herfindahl-Hirschman Index (HHI) and Altman's Z Score, respectively. Appendix Table III reports the detailed description of all variables. Additionally, to avoid the outliers' impact, all continuous variables are winsorized at the one top and bottom percentiles of their distributions. All independent variables are lagged one period.

3.2. Summary Statistics

[Table 1](#) shows summary statistics of the main variables of firms that had and those that did not have CM&As in Belt and Road countries in 2014-2022. For firms with CM&A in Belt and Road countries, the average Tobin's Q is 1.892 with a standard deviation of 1.110, and 33.7% of them have CM&A experience. The variable, Size, which is the logarithm of total assets in yuan, has a mean value of 22.701. The average of ROA is 0.042, and that of Liability is 0.433.

Their average Firm Age is 19 years. Governance variables such as Largest Holder Rate and Top Ten Holders Rate are expressed as percentages, with the largest shareholders holding an average of one-third of the stock. For firms without CM&A in Belt and Road countries, their average Tobin's Q of 2.090, and 17.3% of them had CM&A experience. Their average Size is similar at 22.090. The average ROA for these firms is 0.053, with a slightly lower Liability of 0.408.

4. Short-term Investors' Valuations

We use ESM to assess how investors value the announcement of a firm's CM&A in Belt and Road countries in the short term. Using ESM to calculate abnormal stock returns is a crucial empirical technique for capturing external investors' reactions and valuations (Guo & Yu, 2024). ESM helps reinforce the causal relationship by using high-frequency data to evaluate the anticipated impact of new information (Eden et al., 2022). We downloaded the announcement dates of firms' CM&As in Belt and Road countries, as well as firms' stock returns and daily market returns, from the CSMAR database.

Following the ESM employed by Flammer (2021), we set the announcement date of a CM&A as the event date, i.e., day 0. We use the market model to estimate abnormal returns. The market model is:

$$R_{i,t} = \alpha_i + \beta_i \times R_{m,t} + \varepsilon_{i,t} \quad (1)$$

Where $R_{i,t}$ indicates the daily return of firm i on day t , $R_{m,t}$ indicates the daily market return on day t , and ε refers to residual. Daily market return is a proxy for the market portfolio of risky

assets, which is presented by Shanghai Stock Exchange and Shenzhen Stock Exchange Composite Index (Du & Boateng, 2015).

For each firm which has a CM&A in Belt and Road countries, we use OLS estimation to calculate the coefficient β and constant α based on 200 trading days [-220, -21] prior to the first announcement date ($t=0$)³, and then get the abnormal daily return $AR_{i,t}$.

$$\hat{R}_{i,t} = \hat{\alpha}_i + \hat{\beta}_i \times R_{m,t} \quad (2)$$

$$AR_{i,t} = R_{i,t} - \hat{R}_{i,t} \quad (3)$$

Finally, we can obtain the CAR by summing the abnormal returns over the event period where we choose [-5, 1] as the event window.

$$CAR_{i,t} = \sum_{t=-5}^1 AR_{i,t} \quad (4)$$

[Table 2](#) presents the event study results, which has 110 announcement-day observations. The CAR is 1.5% and significantly different from zero at the 5% level in the event window [-5, 1]⁴, but CARs before and after the event window yield are statistically insignificant. These results indicate that CM&As in Belt and Road countries positively affects short-term market reactions. Our finding is consistent with previous literature that Chinese firms' CM&As result in a positive market reaction (Du & Boateng, 2015; Gaur et al., 2013; Tao et al., 2017), but it is also

³ We only keep the firms without missing value during 200 trading days [-220,-21] prior to the first announcement date.

⁴ When the event window is [-5,3], the CAR is 1.4% and significant at the 5% level.

inconsistent with some findings that CM&As do not create positive value (Aybar & Ficici, 2009; Chen & Young, 2010). Compared to general CM&As, those conducted in Belt and Road countries convey two types of information: the CM&A itself and a signal of the firm's political affinity.

Considering the different conclusions of scholars on the short-term market reactions of CM&As, we conduct two heterogeneity analyses based on the event study results to determine whether the short-term positive investors' valuations are driven by the firm's signal of political affinity. This approach helps to isolate the effects of signal on stock market returns following CM&As from other effects.

Firstly, considering that the Chinese government controls the primary sources of resources (Zhang et al., 2016) and directly controls SOEs, which dominate the capital market, the signal value to SOEs would be limited. In contrast, non-SOEs face a different scenario. Non-SOEs aim to maximize shareholder wealth, driven by the net present value principle. However, they encounter two main disadvantages: less state support and lower legitimacy (Schuler et al., 2017). Non-SOEs investing in Belt and Road countries can signal their political affinity, thereby enhancing their reputation and legitimacy among investors. This behavior can be valued by stockholders (Barnett, 2007). Consequently, when non-SOEs engage in CM&As, their performance improves.

Secondly, the Chinese central government published policy: Vision and Actions for Promoting the Construction of the Silk Road Economic Belt and the 21st Century Maritime Silk Road (also known as the Vision and Actions), and clarified the roles of different provinces and municipalities in the construction of the BRI. The core area of the BRI in China includes 16 provinces⁵. Due to China's top-down political structure, local governments are expected to strictly adhere to the central government's decisions and implement policies accordingly (Lin et al., 2015). As a result, these provincial governments incorporated the BRI into their annual Reports on the Work of the Government. Compared to other provinces, these sixteen provinces are considered the core area by the central government, thus bearing more responsibilities related to the national strategy. Moreover, the governors and relevant administrative directors of these provinces actively promote local enterprises to participate in national strategies to advance their political careers. Firms in these provinces benefit from additional support and, this can assist local officials in achieving central government missions and political targets. Consequently, firms located in these 16 core provinces may benefit more from engaging in CM&As in BRI countries, leading to even stronger investors' valuations.

In [Table 3](#), we examine which characteristics could generate positive CARs, including firm's ownership and location. In Panel A, we find that the market reaction to non-SOEs' CM&As is significant, supporting the notion that the signaling value of political affinity is more pronounced for non-SOEs. In Panel B, we find that the market also reacts more strongly to

⁵ The core provinces are Xinjiang, Qinghai, Gansu, Shaanxi, Ningxia, Chongqing, Sichuan, Guangxi, Yunnan, Inner Mongolia, Jiangsu, Zhejiang, Fujian, Guangdong, Hainan, and Shandong Province.

CM&As of firms located in core provinces, as these firms are likely to receive more potential benefits. These findings provide more support for our signaling arguments.

5. Long-term Investors' Valuations

5.1. Propensity Score Matching and Difference-in-differences Estimations

In this section, we investigate the effects of CM&As in Belt and Road countries on long-term investors' valuations, because both stock returns and Tobin's Q are commonly utilized metrics of investor valuation in management studies (Guo & Yu, 2024). Although the state government facilitated the BRI, the decision to follow this policy by engaging in CM&As in Belt and Road countries is endogenous to firms. Thus, there is a self-selection bias associated with those firms engaging in CM&As in Belt and Road countries. To address the endogeneity, we employ a propensity score matching (PSM) (Rosenbaum & Rubin, 1985) combined with difference-in-differences (DID) estimations by constructing a plausible counterfactual control group and avoiding functional form restrictions on the outcome equation (Choi & Greaney, 2022; Smith & Todd, 2005).

We start by referring to the firms that have engaged in a CM&A in Belt and Road countries as the "treated" group. In contrast, firms that have never participated in a CM&A in Belt and Road countries are referred to as the base pool of constructing a control group. We call it never-treated group. Within the never-treated group, we select a control group of firms that did not have CM&As in Belt and Road countries but had characteristics similar to those of the treated firms. Matching is performed based on the following variables: Tobin's Q, Size, ROA, Liability,

Firm Age, Experience, Z Score, HHI, Largest Holder Rate, Top Ten Holders rate, and time, industry, and provinces dummies. Specifically, Tobin's Q, Size, ROA, Liability and Firm Age are used to control firms' financial and other basic attributes characteristics. Largest Holder Rate and Top Ten Holders Rate are used to control firm's governance structure and shareholder power (Deng et al., 2020; Yang et al., 2019). Experience indicates the firm's previous experience of CM&As, as experience could help firms to overcome obstacles about entering overseas markets (Lu et al., 2014). We also include Altman's Z score as a control variable, given that distressed firms may pursue acquisitions to diversify bankruptcy risk (Zhang, 2022), and firms with political affinity might have a higher survival probability (Akcigit et al., 2023). In addition, the industry-based perspective suggests that the strategic decisions of a firm are primarily influenced by the specific conditions within the industry it operates (Chen et al., 2018; Porter, 1997), so we choose a common HHI as an industry-level variable which measures industry's concentration and competition (Dong et al., 2021). Akcigit et al. (2023) identify market leaders prefer political connections which could slow down competitions.

Propensity scores are estimated through one-to-five nearest neighbor matching with a caliper of 0.01. Matching eliminates differences between the matched firms with CM&As in Belt and Road countries and those without due to these observable characteristics. However, there might be other systematic differences between the treated and control groups that are not captured by observable characteristics. Using a difference-in-differences estimations with propensity score matching estimator alleviates the issue by eliminating unobservable time-invariant difference

between the treated and control groups. It differs from the standard difference-in-differences estimator by including only treated firms within the common support and weighting of the control group firms according to Mahalanobis' distance within caliper matching rather than linearly (Heckman et al., 1997; Smith & Todd, 2005).

Our approach provides another advantage. The fact that the CM&As events occurred at different years in our longitudinal dataset alleviates concerns that the outcome observed after treatment is caused by factors related to the time of the treatment rather than to the treatment itself. But it also poses a practical issue of how to assign counterfactual treatment dates to the firms in the control group. We align observations in event time and assign counterfactual treatment dates at random to the firms that never had CM&As proportionally to the fraction of “treated” firms that had CM&As in each calendar year (Eichler & Lechner, 2002).

The definitions of variables and probit estimation results are detailed in the Appendix Table III and IV. [Table 4](#) reports the post-matching differences in firm characteristics between treated and control firms matched using propensity scores. Columns 1, 2 and 3 present the number of observations, mean values and standard deviation, respectively. Columns 4 show the p-values of the difference-in-means test. These results indicate that the matching process effectively selects a control group similar to the treatment group.

We compare the difference in Tobin's Q before and after the treatment for firms that announce CM&As in Belt and Road countries (treated firms) with the corresponding difference firms that do not conduct a CM&A in Belt and Road countries but are otherwise similar (control firms). We follow the method of Choi and Greaney (2022).

Firstly, we define a binary variable that indicates an announcement of CM&A in Belt and Road countries for the firm i in year t .

$$D_{i,t} = \begin{cases} 1 & \text{if } CM\&A_{i,t} = 1 \text{ and } CM\&A_{i,t-1} = 0 \\ 0 & \text{if } CM\&A_{i,t} = 0 \text{ and } CM\&A_{i,t-1} = 0 \end{cases} \quad (5)$$

Secondly, we make $\Delta Y_{1,i,t}$ be the change in Tobin's Q for firm i between year t and $t-1$ for $D_{i,t}=1$ (i.e., CM&A in year t), and make $\Delta Y_{0,i,t}$ be the change in Tobin's Q for firm i between year t and $t-1$ for $D_{i,t}=0$ (i.e., non-CM&A in year t). As we could not observe $\Delta Y_{1,i,t}$ and $\Delta Y_{0,i,t}$ at the same time, $\Delta Y_{i,t}$ can be presented as follows:

$$\Delta Y_{i,t} = \Delta Y_{0,i,t} + (\Delta Y_{1,i,t} - \Delta Y_{0,i,t}) \times D_{i,t} \quad (6)$$

Then we measure average treatment effect. As we have constructed the counterfactual in the previous section, we can calculate the average treatment effect on the treated (ATET) with dealing a CM&A in Belt and Road countries serving as treated group:

$$ATET = \mathbb{E}[\Delta Y_{1,i,t} - \Delta Y_{0,i,t} | D_{i,t} = 1] \quad (7)$$

[Table 5](#) presents the results based on the PSM-DID estimations, indicating a statistically significant increase of 0.234 in firm investors' valuations, measured by Tobin's Q, one year after the CM&As in Belt and Road countries (i.e., $t+1$). We also find a similar positive result two years after the CM&As in Belt and Road countries. These findings align with our hypothesis that CM&As in Belt and Road countries positively affect a firm's investors' valuations.

To assess whether the long-term positive investors' valuations is driven by the firm's signal of political affinity, we focus on firm's ownership and location, and conducted two heterogeneity analyses based on the PSM-DID estimations.

[Table 6](#) replicates the analysis of [Table 5](#), with the dependent variable being Tobin's Q, but the sample is split into SOEs and non-SOEs. The results indicate that non-SOEs' CM&As lead to a 31.7% Tobin's Q premium one year after and a 31%, two years after the CM&As, while SOEs do not experience this effect. The results enhance the argument of the signal value of political affinity.

[Table 7](#) replicates the analysis of [Table 5](#) with Tobin's Q as the dependent variable, but the sample is split into core provinces and non-core provinces. The results show that firms located in core provinces experience a 43.1 percentage point increase in Tobin's Q one year after the CM&A. The increase is estimated to be 35.1% for the second year, and 35.2% for the third year

after the CM&A. In contrast, CM&As by firms located in non-core provinces do not have significant impacts. This finding supports the idea that it is chiefly firms in core provinces that benefit more from CM&As in BRI countries.

5.2. Comparison with Other CM&As

In the previous section, we compared firms engaged in CM&As in Belt and Road countries with those that did not have CM&A in Belt and Road countries. This section examines how investors value CM&As based on firms' destinations, specifically comparing CM&As in Belt and Road countries to the rest. When a firm chooses to follow government strategies and conducts an CM&A in a Belt and Road country, external investors are likely to react more positively than they would to CM&As in other countries. This positive reaction stems from the perception that CM&As in Belt and Road countries signal the firm's political affinity and alignment with the government policy. This also allows us to compare the performance between firms that both had CM&As but only differ in terms of the locations of their CM&As, eliminating the possibility that it was CM&As rather than CM&As in Belt and Road countries that have driven the prior results.

Using the CSMAR database, we collected the announcement dates for all CM&As. Firms that invested in other countries are chosen as the control group. We use one-to-one nearest neighbor matching based on same variables as before, which are Tobin's Q, Size, ROA, Liability, Firm

Age, Experience, Z Score, HHI, Largest Holder Rate, Top Ten Holders Rate, along with time, industry, and province dummies.

[Table 8](#) examines the difference in Tobin's Q between firms investing in Belt and Road countries and those in other countries. Firms with CM&As in Belt and Road countries experience a 25.7% percentage point growth in Tobin's Q one year later, significant at the 10% level. [Tables 9](#) and [10](#) display results consistent with those in [Tables 6](#) and [7](#), respectively, confirming the robustness of our findings. Therefore, when non-SOEs or firms located in core provinces align with government initiatives by investing in Belt and Road countries, firms' Tobin's Q significantly increases, highlighting the investors positively value the firms' signal.

5.3. Greenfield Investments

In addition to CM&As, greenfield investment is another way to "go abroad". From signaling theory perspective, only costly signal would be credible. Greenfield investments can be considered less credible than CM&As because firms can initially invest a small amount in greenfield. In other words, CM&As require firms to purchase the needed external assets immediately; however, considering potential upside benefits and downside risks, greenfield investments projects have real options advantages and they enable a firm to gradually purchase assets by starting on a smaller scale and expanding as market conditions become more favorable (Brouthers & Dikova, 2010; Slangen, 2013). Meanwhile, greenfield investments can be easier and cheaper to abandon (Anand & Delios, 2002; Brouthers & Dikova, 2010). In general, the "option" attribute makes cross-border greenfield investments a less credible signal than CM&A.

To examine whether market positively reacted to the less credible signal conveyed by greenfield investments in Belt and Road countries, we collect Chinese firms' greenfield investments from fDi Markets database. This database has been widely used in finance and international business (Duanmu, 2014). We obtain data on 245 firms making their first greenfield investments in Belt and Road countries in 2014-2022. To construct a control group, firstly, we select control firms that never invested in Belt and Road countries from the greenfield investments data using the same process as we did previously for CM&A. Secondly, we used nearest neighbor matching based on the same variables as in Section 5.1, including Tobin's Q, Size, ROA, Liability, Firm Age, GF Experience, Z Score, HHI, Largest Holder Rate, Top Ten Holders Rate, along with time, industry, and province dummies. GF Experience indicates the firm's previous experience of greenfield investments. It takes value of 1 if a firm had a greenfield investment before 2014, and 0 otherwise. Other variables are same with the previous and are shown in Appendix Table III. The probit estimation results are shown in Appendix Table V. Thirdly, we employ a DID estimation of Tobin's Q. [Table 11](#) reports results about PSM-DID estimations of Tobin's Q over a 3-year horizon. We do not find significant increase of Tobin's Q after the greenfield investments in Belt and Road countries. These results are consistent with signaling theory that only costly signal would make firms' commitments be credible for external investors, such as CM&As.

5.4. Potential Benefits of Signal

The political affinity view posits that firms with political affinity gain fiscal advantages, such as low-cost bank loans (Houston et al., 2014) or government bailouts during insolvency (Faccio et al., 2006). One of the reasons is that political relationship allow firms superior access to state-controlled resources, leading creditors to view them as less risky compared to their nonconnected counterparts (Boubakri et al., 2012). Research has shown that politically connected firms have lower failure rates (D'Aveni, 1990), and they are more likely to receive government assistance during financial distress (Faccio et al., 2006). As a result, if the firms conduct CM&As in Belt and Road countries, we expect that these firms could have lower loan interest rates and lower bankruptcy risk.

Following this, we observe two outcomes which are the firm's long-term loan interest rates and Altman's (1968) Z score. [Table 12](#) shows the matching results for long-term loan interest rates, which are calculated by dividing interest payable by long-term liabilities. Three years after the CM&As, the invested firms' loan interest rates show a -12.9% drop in their long-term loan interest rates, at the 5% level. [Table 13](#) shows the matching results for Z score where the higher Z score means lower bankruptcy risk. Firms had CM&As have a 61.2 percentage point one year later, and 75.8 percentage point two years after, indicating that CM&As in Belt and Road countries increased their financial viability.

6. Conclusion

Can firms' CM&As positively affect investors' valuations? In this research, we shed light on this question by exploiting the effects of Chinese firms' CM&A in Belt and Road countries. Our empirical analysis including short term and long term reveals that firms' announcement of CM&As in these countries experience significantly higher investors' valuations, particularly evident in non-SOEs and firms located in core provinces. These findings are consistent with the signaling argument: by announcing CM&As in Belt and Road countries, firms credibly signal their political affinity. The external investors positively react to this signal and pay a premium. This research contributes to signaling theory by showing that CM&As can be powerful signals for external investors in the suitable policy context. By engaging in CM&As in Belt and Road countries, firms convey a message to the market that they are committed to the government policies. This credible commitment is costly and thus difficult for "low-quality" firms to mimic, which makes the signal more trustworthy to external investors.

Our research has several limitations that could serve as avenues for future research. Firstly, our sample is limited to Chinese listed firms, and China is a one-party system country. It is crucial to investigate whether the observed positive effects are replicable in other countries and among small and medium-sized enterprises. Secondly, we treat external investors as one homogeneous group. However, investor types vary, including retail and institutional investors, whose responses to firm signals may differ. Future research could explore these differential reactions.

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Figure 1. The Number of Chinese Listed Firms' CM&As in Belt and Road Countries

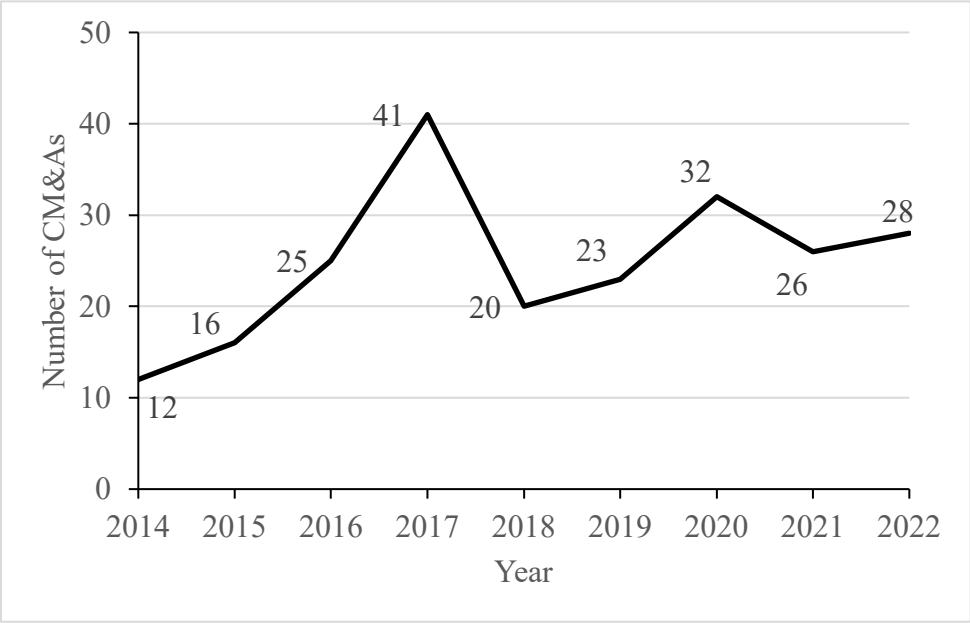


Table 1. Descriptive Statistics

Variables	N	Mean	S.D.	Min	Max
Panel A: Firm-year observations with a CM&A in Belt and Road countries 2014-2022					
Tobin's Q	1,512	1.892	1.110	0.837	8.909
Experience	1,696	0.337	0.473	0	1
Size	1,561	22.701	1.372	19.029	26.273
Liability	1,696	0.433	0.188	0.0596	0.889
ROA	1,696	0.042	0.065	-0.280	0.272
Largest Holder Rate	1,552	32.370	14.388	8.480	74.820
Top Ten Holders Rate	1,552	58.317	15.489	23.910	95.250
Z Score	1,525	4.230	4.464	-0.076	37.160
HHI	1,696	0.127	0.123	0.027	0.877
Firm Age	1,557	19.030	5.384	7	34
Panel B: Firm-year observations without a CM&A in Belt and Road countries 2014-2022					
Tobin's Q	28,287	2.090	1.379	0.837	8.909
Experience	37,690	0.173	0.378	0	1
Size	30,311	22.092	1.371	19.029	26.273
Liability	37,656	0.408	0.197	0.0596	0.889
ROA	37,655	0.053	0.077	-0.280	0.272
Largest Holder Rate	29,171	33.822	14.802	8.480	74.820
Top Ten Holders Rate	29,171	59.663	15.583	23.910	95.250
Z Score	28,520	5.129	5.880	-0.076	37.160
HHI	37,609	0.136	0.145	0.0267	0.877
Firm Age	30,017	19.010	5.788	7	34

Note: This table reports the number of observations (N), mean (Mean), standard deviation (S.D.), minimum (Min), maximum (Max). Panel A provides summary statistics for firms with a CM&A in Belt and Road countries in 2014-2022. Panel B provides summary statistics for firms without a CM&A in Belt and Road countries in 2014-2022. All continuous variables are winsorized at the 1% level on both sides of the distribution. All variables are defined in the Appendix Table III. Sample period: 2014-2022.

Table 2. Stock Market Reaction

Event time	CAR	Standard error
[-20, -11]	-0.007	0.007
[-10, -6]	-0.004	0.005
[-5, 1]	0.015**	0.006
[6, 10]	0.004	0.005
[11, 20]	-0.003	0.006

Note: Table 2 reports the CAR for different event time around the first announcement date of CM&A in Belt and Road countries. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3. Cross-sectional Heterogeneity

	CAR [-5, 1]	Standard error
Panel A. SOE and Non-SOE		
SOEs	0.002	0.009
Non-SOEs	0.022***	0.008
Panel B. Core Provinces and Non-Core Provinces		
Core Provinces	0.018**	0.008
Non-Core Provinces	0.011	0.008

Note: Table 3 reports the CAR [-5, 1] from Table 2 for different firms. Panel A compares the market reaction of SOEs and non-SOEs. Panel B compares the market reaction of firms whether they are in core provinces. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4. Post-matching Difference

		N	Mean	S.D.	p-value (diff. in means)
		(1)	(2)	(3)	(4)
Tobin's Q	Treated	155	1.945	1.098	0.327
	Control	557	2.063	1.375	
Size	Treated	155	22.598	1.225	0.410
	Control	557	22.501	1.315	
Firm Age	Treated	155	17.935	4.945	0.584
	Control	557	18.212	5.711	
ROA	Treated	155	0.051	0.047	0.967
	Control	557	0.051	0.053	
Liability	Treated	155	0.417	0.188	0.712
	Control	557	0.423	0.194	
Experience	Treated	155	0.335	0.474	0.265
	Control	557	0.289	0.454	
Z Score	Treated	155	4.660	4.915	0.594
	Control	557	4.928	5.700	
HHI	Treated	155	0.119	0.092	0.242
	Control	557	0.131	0.113	
Largest Holder Rate	Treated	155	33.535	14.490	0.963
	Control	557	33.475	14.335	
Top Ten Holders Rate	Treated	155	61.265	15.070	0.621
	Control	557	60.616	14.292	

Note: This table presents the post-matching descriptive statistics, which are number of observations (N), mean (Mean), standard deviation (S.D.) and p-value of the difference-in-means test, comparing treated and control firms. Levels (e.g., Tobin's Q) are measured in the year preceding the announcement of CM&A ($t-1$). Definitions of the variables are listed in Appendix Table III.

Table 5. Matching Results for Tobin's Q

Outcome	Tobin's Q		
	(1)	(2)	(3)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.234*** (0.089)	130 [-0.007]	458 [-0.241]
<i>t, t+2</i>	0.240** (0.120)	116 [-0.099]	406 [-0.338]
<i>t, t+3</i>	0.230 (0.162)	89 [-0.061]	310 [-0.291]

Note: Table 5 reports results about PSM-DID estimations of Tobin's Q over a 3-year horizon, following a CM&A deal in Belt and Road countries. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that never conduct a CM&A in Belt and Road countries. The "Treated Firms" and "Control Firms" columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6. Matching Results for Tobin's Q: Compare SOEs with Non-SOEs

Outcome	Tobin's Q					
	SOEs			Non-SOEs		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.011 (0.141)	30 [-0.131]	146 [-0.142]	0.317*** (0.110)	100 [0.029]	312 [-0.287]
<i>t, t+2</i>	0.085 (0.028)	26 [-0.263]	123 [-0.291]	0.310** (0.148)	90 [-0.051]	273 [-0.361]
<i>t, t+3</i>	0.096 (0.252)	21 [-0.195]	106 [-0.291]	0.271 (0.205)	68 [-0.020]	204 [-0.291]

Note: Table 6 reports results about difference-in-differences matching estimations of Tobin's Q over a 3-year horizon, following a CM&A deal in Belt and Road countries. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that never conduct a CM&A in Belt and Road countries. The sample is split into SOEs and non-SOEs. The "Treated Firms" and "Control Firms" columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7. Matching Results for Tobin's Q: Compare Core Provinces with Other Provinces

Outcome	Tobin's Q					
	Core Provinces			Non-Core Provinces		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.431*** (0.116)	84 [0.127]	297 [-0.303]	0.128 (0.131)	46 [-0.253]	161 [-0.126]
<i>t, t+2</i>	0.351** (0.151)	76 [0.003]	258 [-0.347]	0.030 (0.198)	40 [-0.292]	148 [-0.322]
<i>t, t+3</i>	0.352* (0.213)	58 [0.054]	201 [-0.298]	0.002 (0.240)	31 [-0.277]	109 [-0.279]

Note: Table 7 reports results about difference-in-differences matching estimations of Tobin's Q over a 3-year horizon, following a CM&A deal in Belt and Road countries. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that never conduct a CM&A in Belt and Road countries. The sample is split into firms located in core provinces and non-core provinces. The "Treated Firms" and "Control Firms" columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8. Matching Results for Tobin's Q: Compare with CM&As in Other Countries

Outcome	Tobin's Q		
	(1)	(2)	(3)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.257* (0.146)	79 [-0.094]	73 [-0.351]
<i>t, t+2</i>	0.054 (0.198)	70 [-0.158]	65 [-0.211]
<i>t, t+3</i>	0.155 (0.210)	54 [-0.113]	53 [-0.268]

Note: Table 8 reports results about PSM-DID estimations of Tobin's Q over a 3-year horizon, following a CM&A deal. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that conduct CM&As in non Belt and Road countries. The "Treated Firms" and "Control Firms" columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9. Matching Results for Tobin's Q: Compare SOEs' and Non-SOEs' CM&As in Belt and Road Countries with Other Countries

Outcome	Tobin's Q					
	SOEs			Non-SOEs		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.064 (0.235)	23 [-0.135]	15 [-0.199]	0.313* (0.179)	56 [-0.077]	58 [-0.390]
<i>t, t+2</i>	0.096 (0.365)	20 [-0.222]	15 [-0.126]	0.105 (0.237)	50 [-0.132]	50 [-0.237]
<i>t, t+3</i>	0.078 (0.340)	18 [-0.131]	12 [-0.209]	0.181 (0.264)	36 [-0.104]	41 [-0.285]

Note: Table 9 reports results about difference-in-differences matching estimations of Tobin's Q over a 3-year horizon, following a CM&A deal. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that conduct CM&As in non Belt and Road countries. The sample is split into SOEs and non-SOEs. The "Treated Firms" and "Control Firms" columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 10. Matching Results for Tobin’s Q: Compare Core Provinces’ and Other Provinces’ CM&As in Belt and Road Countries with Other Countries

Outcome	Tobin’s Q					
	Core Provinces			Non-Core Provinces		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.458** (0.183)	51 [0.041]	52 [-0.418]	-0.154 (0.235)	28 [-0.339]	21 [-0.186]
<i>t, t+2</i>	0.271 (0.250)	46 [-0.016]	44 [-0.287]	-0.377 (0.318)	24 [-0.429]	21 [-0.052]
<i>t, t+3</i>	0.373 (0.270)	35 [-0.131]	35 [-0.209]	-0.255 (0.326)	19 [-0.368]	18 [-0.112]

Note: Table 10 reports results about difference-in-differences matching estimations of Tobin’s Q over a 3-year horizon, following a CM&A deal. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that conduct CM&As in non Belt and Road countries. The sample is split into firms located in core provinces and non-core provinces. The “Treated Firms” and “Control Firms” columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 11. Matching Results for Tobin's Q

Outcome	Tobin's Q		
	(1)	(2)	(3)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.011 (0.076)	159 [-0.235]	541 [-0.246]
<i>t, t+2</i>	0.065 (0.110)	132 [-0.205]	432 [-0.270]
<i>t, t+3</i>	0.118 (0.141)	109 [-0.155]	352 [-0.273]

Note: Table 11 reports results about PSM-DID estimations of Tobin's Q over a 3-year horizon, following a greenfield investment project in Belt and Road countries. The treated group are firms that conduct a greenfield investment in Belt and Road countries. The control group are firms that never conduct a greenfield investment in Belt and Road countries. The "Treated Firms" and "Control Firms" columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 12. Matching Results for Long-term Loan Interest Rates

Outcome	Long-term Loan Interest Rates		
	(1)	(2)	(3)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	-0.010 (0.030)	36 [0.006]	69 [0.015]
<i>t, t+2</i>	-0.011 (0.042)	21 [0.005]	49 [0.016]
<i>t, t+3</i>	-0.129** (0.057)	14 [-0.105]	31 [0.024]

Note: Table 12 reports results about difference-in-differences matching estimations of Long-term Loan Interest Rates over a 3-year horizon, following a CM&A deal in Belt and Road countries. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that never conduct a CM&A in Belt and Road countries. The “Treated Firms” and “Control Firms” columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 13. Matching Results for Z Score

Outcome	Z Score		
	(1)	(2)	(3)
<i>t</i>	PSM-DID Estimation	Treated Firms	Control Firms
<i>t, t+1</i>	0.612** (0.283)	131 [-0.002]	459 [-0.614]
<i>t, t+2</i>	0.758** (0.376)	118 [-0.174]	407 [-0.932]
<i>t, t+3</i>	0.770 (0.504)	89 [0.029]	310 [-0.741]

Note: Table 13 reports results about difference-in-differences matching estimations of Z Score over a 3-year horizon, following a CM&A deal in Belt and Road countries. The treated group are firms that conduct a CM&A in Belt and Road countries. The control group are firms that never conduct a CM&A in Belt and Road countries. The “Treated Firms” and “Control Firms” columns display the respective number of observations on the common support. Standard errors are in parentheses. Mean values of firms are in square brackets. *** p<0.01, ** p<0.05, * p<0.1.

Appendices

Table I. Country Distribution of CM&As under BRI

Country	Number of CM&As
Albania	1
United Arab Emirates	2
Brunei	2
Croatia	1
Hungary	1
Indonesia	4
India	4
Israel	7
Japan	70
Kazakhstan	2
South Korea	32
Sri Lanka	1
Malaysia	17
Poland	2
Singapore	70
Serbia	1
Thailand	6
Turkey	5
Ukraine	1
Uzbekistan	1
Vietnam	3
Total	233

Table II. Industry Distribution of CM&As under BRI

Industry	Number of CM&As
Professional, Scientific and Technical Services	2
Specialized Equipment Manufacturing	6
Internet and Related Services	2
Instrumentation Manufacturing	1
Agriculture	2
Agricultural and Sideline Food Processing	3
Manufacture of Chemical Raw Materials and Chemical Products	19
Pharmaceutical Manufacturing	11
Printing and Reproduction of Recorded Media	1
Business Services	3
Civil Engineering Construction	2
Comprehensive Utilization of Waste Resources	1
Building Decoration and Other Construction	1
Auxiliary Mining Activities	1
Real Estate	4
Wholesale Trade	8
Culture and Arts	1
Nonferrous Metal Smelting and Rolling	10
Nonferrous Metal Mining and Dressing	1
Rubber and Plastic Products	6
Water Transport	5
Automobile Manufacturing	12
Fishery	1
Ecological Protection and Environmental Governance	2
Electric Power, Heat Production, and Supply	3
Electrical Machinery and Equipment Manufacturing	18
Leather, Fur, Feather Products and Footwear Manufacturing	1
Petroleum and Natural Gas Extraction	1
Research and Experimental Development	1
Textile Industry	2
Textile and Apparel Industry	7
Comprehensive	2
Manufacture of Computers, Communications and Other Electronic Equipment	36
Software and Information Technology Services	8
General Equipment Manufacturing	14
Paper and Paper Products Manufacturing	1
Road Transport	4
Manufacture of Wine, Beverages, and Refined Tea	1

Metal Products	6
Manufacture of Railway, Ship, Aerospace and Other Transportation Equipment	1
Retail Trade	5
Non-metallic Mineral Products	9
Food Manufacturing	7
Ferrous Metal Smelting and Rolling	1
Total	233

Table III. Descriptions of Variables

Variables	Description
Tobin's Q	It is measured as the market value divided by total assets.
CM&A	It is a dummy variable. It equals 1 when firm <i>i</i> has a CM&A deal in a Belt and Road country in year <i>t</i> ; otherwise, it equals 0.
ROA	It is measured as the net profit divided by total assets
Liability	It is measured as the total liability divided by total assets.
Size	It is defined as the nature logarithm of total assets.
Firm Age	It is defined as the number of years since a firm's establishment.
Largest Holder Rate	It is defined as the shareholding ratio of the largest shareholder.
Top Ten Holders Rate	It is defined as the shareholding ratio of the top ten largest shareholders.
Experience	It is a dummy variable. It takes value of 1 if a firm has a CM&A before 2014, and 0 otherwise.
Core Province	It equals one if firm <i>i</i> registered address located in the core provinces, and 0 otherwise. The sixteen core provinces are Xinjiang, Qinghai, Gansu, Shaanxi, Ningxia, Chongqing, Sichuan, Guangxi, Yunnan, Inner Mongolia, Jiangsu, Zhejiang, Fujian, Guangdong, Hainan, and Shandong Province.
SOE	It is a dummy variable. It takes value of 1 if a firm is state-owned, and 0 otherwise.
Long-term Loan Interest Rate	It is measured as the interest payable divided by long-term liabilities.
HHI	It is Herfindahl-Hirschman Index that is calculated by summing the squares of the market shares of all firms within an industry.
Z Score	It is a financial metric used to predict the likelihood of a company facing bankruptcy (Altman, 1968).
GF Investment	It is a dummy variable. It equals 1 when firm <i>i</i> has a greenfield investment in a Belt and Road country in year <i>t</i> ; otherwise, it equals 0.
GF Experience	It takes value of 1 if a firm had a greenfield investment before 2014, and 0 otherwise.

Table IV. Probit Estimate of CM&A

VARIABLES	(1) CM&A
Tobin's Q	0.012 (0.056)
Size	0.192*** (0.047)
Firm Age	-0.019** (0.009)
ROA	1.568* (0.949)
Liability	-0.266 (0.366)
Experience	0.145 (0.109)
Z Score	-0.013 (0.014)
HHI	1.343 (1.022)
Largest Holder Rate	-0.008** (0.004)
Top Ten Holders Rate	0.009** (0.004)
Constant	-5.045*** (1.248)
Year Fixed Effects	Yes
Industry Fixed Effects	Yes
Province Fixed Effects	Yes
Observations	2,213
Pseudo R ²	0.100

Note: This table reports the results from estimating the probit model, and the dependent variable is CM&A. CM&A equals 1 for the year in which the CM&A in Belt and Road countries occurred and 0 for all previous years, and the data is cut after the investment. For a firm that has never had an investment, CM&A equals to 0 all the time. We include year, industry, and province dummies. All continuous variables are winsorized at the 1% level on both sides of the distribution. All independent variables are lagged one period. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table V. Probit Estimate of GF Investment

VARIABLES	(1) GF Investment
Tobin's Q	0.132*** (0.048)
Size	0.251*** (0.043)
Firm Age	-0.018** (0.008)
ROA	0.869 (0.813)
Liability	-0.486 (0.340)
GF Experience	0.134 (0.144)
Z Score	-0.030** (0.013)
HHI	1.492* (0.816)
Largest Holder Rate	-0.006* (0.004)
Top Ten Holders Rate	0.006* (0.004)
Constant	-6.849*** (1.173)
Year Fixed Effects	Yes
Industry Fixed Effects	Yes
Province Fixed Effects	Yes
Observations	2,505
Pseudo R ²	0.103

Note: This table reports the results from estimating the probit model, and the dependent variable is GF Investment. GF Investment equals 1 for the year in which the greenfield investment in Belt and Road countries occurred and 0 for all previous years, and the data is cut after the investment. For a firm that has never had an investment, GF Investment equals to 0 all the time. We include year, industry, and province dummies. All continuous variables are winsorized at the 1% level on both sides of the distribution. All independent variables are lagged one period. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

MS0133: Globalization or Deglobalization? How Different Metrics Tell Different Stories

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GLOBALIZATION OR DEGLOBALIZATION?
HOW DIFFERENT METRICS TELL DIFFERENT STORIES

Extended Abstract prepared for AIB-APAC 2024

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Abstract

The past few years have witnessed a plethora of scholars and practitioners embracing the concept of deglobalization. Our literature review reveals that authors have used different definitions of deglobalization, different metrics, and different levels of aggregation, looking at different institutional origins and different timeframes. To provide a more comprehensive assessment, we performed a series of analyses with metrics commensurable to the conceptualization of globalization on a multi-country dataset consisting of 3,303 unique firms from the top 16 home markets of the Fortune Global 500 firms over the 2001-2022 period (n=35,042). We introduce the difference between equally-weighted degree of internationalization which tracks the evolution of the average firm, and value-weighted degree of internationalization which better captures the evolution at the macroeconomic level. We find that using such distinct metrics leads to different judgements on the development of deglobalization. On the one hand, we identify an overall upswing of globalization for the average firm, a pattern that is robust across different economies. On the other, our analysis of value-weighted degree of internationalization highlights that different economies underwent distinct and even contradictory paths of (de)globalization. We identify the research implications.

Key words:

globalization, deglobalization, multinational enterprises, degree of internationalization, cross-country comparison

1. Introduction

Over the past decade, a narrative has emerged suggesting that the world has entered a phase of “deglobalization” (Van Bergeijk, 2010, 2018). In the wake of the global financial crisis, Brexit, the Covid-19 pandemic, the Russia-Ukraine war, and growing Sino-American rivalry, scholars have declared the end of globalization and the ascend of an era of deglobalization. Some authors have questioned the validity of the international business model based on cross-border arbitrage, trade, and investment (e.g., Peretz & Morley, 2021; Guedhami, Knill, Megginson, & Senbet, 2022; Baldwin & Freeman, 2022; Shenkar, Liang, & Shenkar, 2022). Other authors have examined how US-China

decoupling has ushered in a new world order of deglobalization (e.g., Witt, 2019a, 2019b; Witt, Li, Välikangas, & Lewin, 2021; Witt, Lewin, Li, & Gaur, 2023). A further stream investigated how the decline of global value chains could contribute to deglobalization (e.g., Antràs, 2020; Hu, Tian, Wu, & Yang, 2021). Policy scholars have considered how deglobalization would follow from public sentiments and policies of national and international institutions (e.g., Cuervo-Cazurra, Mudambi, & Pedersen, 2017; Cuervo-Cazurra, Doz, & Gaur, 2020; Devinney & Hartwell, 2020; Hartwell & Devinney, 2021; Rammal, Rose, Ghauri, Jensen, Kipping, Petersen, & Scerri, 2022). Finally, IB scholars examined how deglobalization would affect MNEs' regional and global strategies (e.g., Jeong & Siegel, 2020; Rosa, Gugler & Verbeke, 2020; Luo & Witt, 2021; Benito, Cuervo-Cazurra, Mudambi, Pedersen, & Tallman, 2022; Meyer & Li, 2022; Teece, 2022).

At the same time, work on deglobalization has attracted ample criticism. First, the notion of deglobalization has been criticized for lacking a clear definition and proper theoretical underpinnings. Thus, Evenett (2022) criticized its “flimsiest foundation”. Likewise, Buckley (2020) argued in favor of a “reappraisal of theory” when studying the “reshaping” of globalization. Second, deglobalization scholars have been criticized for focusing too much on the downsides of cross-border competition, integration, and division of labor (e.g., Butzbach, Fuller, & Schnyder, 2020; Hitt, Holmes, & Arregle, 2021) and for overlooking its advantages (Verbeke et al., 2018; Contractor, 2022). Thus, Kobrin (2020) argued in favor of a “more positive view of globalization”. Third, deglobalization research is still largely conceptual in nature (Buckley, 2020) and arguments for the advent of a deglobalization era are criticized being “devoid of a factual basis” (Verbeke et al., 2018) and subject to the selection of metrics (Evenett, 2022). Also, evidence collected from various aspects is yet to be stringed into a coherent claim for deglobalization.

This paper aims to contribute to our understanding of deglobalization in three ways. First, we review the literature on deglobalization. We identify the empirical areas that have been addressed, the theoretical underpinnings that deglobalization scholars have applied, as well as the linkages that authors have stipulated between the different levels of abstraction. The purpose of this exercise is both to appreciate the scope and depth of the deglobalization literature, and to identify possible blind spots. Second, we empirically investigate the degree of internationalization (foreign sales to total sales and

foreign assets to total assets) of the largest 100 companies in terms of revenues based in each of the top 16 home markets of the Fortune Global 500 over the period 2001-2022. We include not just MNEs based in developed but also in emerging market economies such as China, Hong Kong, India, South Korea, and Taiwan, to obtain a global view of trends in companies' degrees of internationalization. Third, to appreciate the distinct economic weight of firms both within and between countries, we introduce the innovation of measuring companies' degree of internationalization in terms of Value-Weighted Foreign sales to Total Sales (VW-FSTS) capturing the economic weight of firms' total sales, vs. Equal-Weighted Foreign sales to Total Sales (EW-FSTS) which treats every firm as equally important. We will show how using these two distinct measures may lead to different or even opposing conclusions on the development of globalization.

2. Literature Review

Deglobalization is not a new concept. The term made its debut in scholarly publications in the heyday of globalization in early 2000s and was only used in hypothetical terms to alert the over-zealous globalists to the dark sides of globalization (Eden & Lenway, 2001) and possibility of its retreat (Desai, 2003). In the aftermath of the 2008-09 financial crisis, triggered by prolonged economic and trade slowdown on a global scale, the notion was recycled, though mainly within the close circle of political scientists, to cast doubt on the sustainability of the neoliberal model characterized by deregulation and pro-trade national policies (Livesey, 2018), which has been the premise of globalization since the 1950s but was severely challenged by the collapse of global financial market (e.g. Van Bergeijk, 2010, 2018).

A vocal deglobalization discourse has marched into the spotlight in the past few years (Petricevic & Teece, 2019; Witt, 2019a; Williamson, 2021; Luo & Witt, 2021), in the wake of a series of black swan events, including the broad-based anti-globalization movements that eventually led to Brexit, the Covid-19 pandemic and the Russia-Ukraine war, which highlighted the downsides of cross-border competition, integration and division of labor (e.g. Butzbach, Fuller, & Schnyder, 2020; Hitt, Holmes, & Arregle, 2021). Claims for deglobalization thus far reflect pervasive concerns surrounding several high-profile phenomena, including 1) the claimed emergence of new world order under US-China decoupling (e.g. Witt, 2019a, 2019b; Buckley & Hashai, 2020; Witt, Li, Välikangas,

& Lewin, 2021; Witt, Lewin, Li, & Gaur, 2023), 2) widely spread anti-globalization sentiments and protectionist policies of national and international institutions (Cuervo-Cazurra, Mudambi, & Pedersen, 2017; Cuervo-Cazurra, Doz, & Gaur, 2020; Devinney & Hartwell, 2020; Hartwell & Devinney, 2021; Rammal, Rose, Ghauri, Jensen, Kipping, Petersen, & Scerri, 2022), 3) disruptions and bottlenecks along global value chains (GVCs) (e.g. Antràs, 2020; Hu, Tian, Wu, & Yang, 2021; Baldwin & Freeman, 2022), and 4) shifted regional and global orientations of MNEs (e.g. Jeong & Siegel, 2020; Rosa, Gugler & Verbeke, 2020; Luo & Witt, 2021; Peretz & Morley, 2021; Benito, Cuervo-Cazurra, Mudambi, Pedersen, & Tallman, 2022; Guedhami, Knill, Megginson, & Senbet, 2022; Meyer & Li, 2022; Teece, 2022 Shenkar, Liang, & Shenkar, 2022). While the first two phenomena are cited as manifestations of deglobalization in de jure terms (Gygli et al., 2019) – i.e., how ongoing social, political, and ideological dynamics serve as drivers of decreased interdependence among nations; the latter reflect the status quo of international business through the lens of MNE activities at varied aggregation levels.

Despite the popular narratives, research on deglobalization so far is largely conceptual in nature and scholars are still grappling with substantiating these arguments with consistent theoretical underpinnings and empirical evidence. Specifically, our review of literature reveals that conclusions drawn in extant studies advancing or contesting the deglobalization narrative are conditional on how deglobalization is conceptualized guided by researchers' theoretical affiliation and how the concept is operationalized and observed.

Deglobalization arguments triggered by the afore-mentioned phenomena seem compelling and have sent chills across regions and sectors around the world. However, such laments for the advent of a deglobalization era are criticized for having a “flimsiest foundation” (Evenett, 2022) and being “devoid of a factual basis” (Verbeke et al., 2018). The empirical evidence preferred by this line of research is at best partial and easily refuted when a slightly different angle is taken. Several issues have not been addressed.

In summary, the debate as to whether the world has embarked on a deglobalization process is far from conclusive and scholars for and against the deglobalization narrative are yet to agree on a definition(s), the timeframe of observation, and a corresponding metric(s) that not only capture the

dynamics of international connectedness on both the corporate and the economy level but also features, given that macroeconomic statistics are aggregated from activities of individual actors, how such dynamics are transmitted from bottom up (Cravino, & Levchenko, 2017; Di Giovanni et al., 2018) which reflect the proactiveness of MNEs as the agents and orchestrates of global economy.

3. Data and Method

In the previous section we saw that much of the deglobalization literature focuses on empirical international business phenomena, such as the evolution of global value chains or Sino-American economic rivalry. While these strands of literature assess how MNEs are reconfiguring internationally, few studies have analyzed systematically, i.e., across a broad range of countries and industries, and over a longer period, if and how companies have increased or decreased their exposure to international markets in line with, or opposing, the notion of deglobalization. This will be the purpose of this and the next section.

We investigate firms' degree of internationalization of the largest 100 companies by revenues based in the top 16 home markets of the Fortune Global 500 over the period 2001-2022. This selection of countries includes MNEs based in (1) traditional developed economies (e.g., U.S., Germany, and Japan), (2) more recently developed market economies (e.g., Hong Kong, South Korea, and Taiwan), as well as (3) in emerging market economies (e.g., Brazil, China, and India). This choice of countries allows us to obtain a global view of trends in companies' degrees of internationalization. In total, the companies selected represented at least 40 percent of global Gross Domestic Product (GDP) and Gross National Product (GNP) over our entire sample period 2001-2022, using World Bank data.

3.1 Data overview

Our data source is Refinitiv Worldscope. Our full sample consists of 35,042 observations including 3,303 unique companies over the period 2001-2022, domiciled in 16 advanced and emerging

industrial economies.¹ We rely mainly on listed companies to have access to adequate company level data.

3.2 Methodology

3.2.1 Metric by weighting schemes

To measure empirically the extent to which companies are increasing or decreasing their degree of internationalization, we introduce the notion of Value-Weighted Foreign Sales to Total Sales (VW-FSTS).² The notion of value-weighted-FSTS takes into account the economic weight of companies, where we use total sales to define such weights.

The operationalization of this measure is:

$$VW-FSTS_{j,t} = \sum_{i=1}^N \frac{total\ sales_{i,t}}{\sum_{i=1}^N total\ sales_{i,t}} FSTS_{i,t},$$

where value-weighted-FSTS of the j-th economy at time t is computed as the sum of each firm's FSTS weighted by the ratio of firm's total sales over aggregate total sales from all firms in its home economy.³ Note that in the weight applied to a firm's FSTS, i.e. the term $\frac{total\ sales_{i,t}}{\sum_{i=1}^N total\ sales_{i,t}}$, the denominator comprises summing up all firms' total revenues in an economy in the given year.

The above operationalization, for the measure FSTS, can be simplified into summing up all foreign sales then divided by the sum of all total sales in an economy in a given year. Further, by changing the weight to 1/N (i.e., equally weighted) this measure becomes a simple average of the FSTS - our equally-weighted metric - for the firms concerned.

Now, the value-weighted metric is *value-centric*, assigning larger weights to larger firms. By contrast, the equally-weighted metric is *volume-centric*, assigning equal weights to all firms, which aligns closely with the statistical principle of large sample size. Hence, the *juxtaposition* of these two metric types of FSTS informs us about the nature of the decrease/increase in internationalization activities. That is, increased value-weighted-FSTS suggests that a given economy has a larger portion

¹ We started with a sample of 100 firms per economy per year, or $100 * 16 * 12 = 35,200$ observations, then removed 9 entries with negative foreign assets, 57 entries with missing total assets, and 92 observations from duplicated entries as detailed towards the end of this section.

² To minimize confusion, we will use full-terms for the weighting schemes or metric types in the remainder of this paper.

³ More technical reader may argue that for the weighted average formula to be complete, we should divide the current measure by summing the weights. This proposition is helpful when we move out of the realm where the sum of weights equal to 1, which is the case for all our metrics. We also provide a general formula at the end of this section.

of sales generated from abroad, while increased equally-weighted-FSTS suggests the *average firm* in the same economy have increasingly pursued internationalization strategies.

3.2.2 Methodology for analysis of trend exploration: Locally Weighted Regression (LOESS)

As our focal interest is the exploration of the temporal development of companies' internationalization activities, we utilized the Locally Weighted Regression (LOESS) method to create the fitted curves from the data points (Cleveland and Devlin, 1998). This non-parametric method allows for high flexibility of the curves fitted instead of having to specify an imposed structure such as U- or S-shapes. Even multiple peaks and turns can thus manifest in the trends. Further, in comparison to visual inspection from time series plots of data points, the LOESS method enables both replicability and explicit testing of certain assumptions.

4. Empirical Results

We conduct our analyses by first focusing on Foreign Sales over Total Sales (FSTS) and complemented by Foreign Assets over Total Assets (FATA). We do so because as explained before, our sample construction is focused on revenue. The FSTS and FATA analyses both consist of the same two types of measures, with the following taking the FSTS analysis as an example. We first analyze the simple average or equally-weighted FSTS (EW-FSTS) of firms over all economies (grand aggregate) and in each economy (national aggregate). Then we examine the value-weighted FSTS (VW-FSTS). In each case, we center our focus on the temporal development, i.e. trend exploration, complemented by the levels of the measures particularly at both ends of the time period.

[Table 1 about here]

Panes A of Figures 1a and 1b demonstrate the equally-weighted-FSTS levels of each of the 16 economies and the black dashed line shows the grand aggregate of equally-weighted-FSTS taking all firms in these economies. The figures suggest that the average firm has tended to generate a larger portion of revenues from abroad over the past twenty years. The grand aggregate of the equally-weighted-FSTS levels witnessed steady increased and plateaued since about 2016, resulting in a climb of 13 *percentage points* (or equivalently about 50% increase in the average FSTS ratio) over the two decades that ended at about 40%. Companies in different economies experienced different realities from waves of FSTS fluctuations, yet almost all economies arrived at FSTS levels higher than the

start, with the exception of Hong Kong. For instance, firms in the Netherlands, starting at high levels of FSTS, stagnated around the 50% line. In contrast, the average firm in Japan experienced continual increase of FSTS reaching 42% in 2022 from a start of about 16% in 2001.

[Figure 1a about here]

[Figure 1b about here]

Panes A of Figures 2a and 2b demonstrate the value-weighted-FSTS levels of each of the 16 economies and the black dashed line shows the weighted FSTS considering all firms in these economies. As the notion of value-weighted-FSTS is value-centric, the data here provides another perspective. The grand aggregate of value-weighted-FSTS levels from all economies first increased, then plateaued from 2011 to 2018, then retreated, yet still arriving at a level of 37%, which is 5 percentage points higher than its start. Comparing the levels at the end and at the start, most economies arrived at notably higher value-weighted-FSTS levels, suggesting that businesses now generate more revenues internationally. The two economies that had almost identical levels in 2001 and 2022 are the U.S. (from 24% to 25%) and Hong Kong (from 38% to 35%).

[Figure 2a about here]

[Figure 2b about here]

Panes B of Figures 1a and 1b depict the trends of EW-FATA. The grand aggregate took a path first upward and peaked around the Global Financial Crisis in 2008, and since headed downwards.

Panes B of Figures 2a and 2b depict the trends of VW-FATA. The grand aggregate, as in equally-weighted-FATA, peaked around 2008, and then continued downwards.

Next, we connect the FSTS and FATA measures to explore to what extent firms have served foreign markets by using foreign assets in the context of overall revenue generation by total assets. In other words, we evaluate two dimensions of an inverse measure of asset intensity, i.e. overall and in foreign markets. Again, we use the same two metric types.

Before we discuss further the implications of our results, we caution the reader to see the revenues and assets in international and home markets as a zero-sum situation which may be an unintended implication of the measures given their home and abroad distinction. Figure 3 provides

this context by grand aggregate results, showing that *both* the total revenues and foreign revenues aggregated from all 16 economies have steadily increased over our sample period, implying *more* revenues *both* at home and abroad for businesses.

[Figure 3 about here]

5. Discussions

In this paper we make four contributions to the literature on (de-)globalization and more generally to the field of international business.

First, we established that the concept of deglobalization has thus far been poorly defined and developed. The deglobalization literature has largely been conceptual in nature and scholars are still grappling with providing both consistent theoretical underpinnings and adequate empirical evidence.

Second, we propose two distinct ways of measuring economy-level IB dynamics through aggregating firms' degree of internationalization with different weighting schemes. In doing so, we endeavor to build a bridge between the otherwise disparate discussions based on varied levels of observations by highlighting the active agency of MNEs in orchestrating economic interactions across borders.

In future, researchers should specify why using equal-weighted or value-weighted indicators of internationalization best serves their research purposes. Alternatively, as we have shown in this paper, there can be great value in *combining* equal-weighted and value-weighted indicators of internationalization as these provide complementary lenses to understanding the phenomenon of (de-)globalization.

The third contribution of this paper, then, is to provide much-needed empirical evidence on the issue of (de-)globalization. We established that researchers will partly draw different conclusions on (de-)globalization, depending on their use of equal-weight or value-weight FSTS metrics. We highlight the most important implications.

First, when measuring the *aggregate trend* of the 35,042 observations represented by 3,303 companies from the 16 countries covered over the period 2001-2022 by employing the FSTS-EW metric, we find no evidence of de-globalization. Instead, *by employing the FSTS-EW metric we find evidence of continuing globalization*. By contrast, *when employing the FSTS-VW metric, we find*

support that globalization has peaked and is on a downward trend. These results underline the importance of combining the EW and VW metrics.

Second, companies based in several important economies continue to show an upward trend irrespective of the metric used. Firms based in Brazil, Germany, Japan, and South Korea continue to increase their FSTS along both indicators. Companies based in France and the UK are showing an upward trend again, irrespective of the EW or VW FSTS metric, after a previous decline. Firms based in the Netherlands show slightly different, but largely upward FSTS trend using both EW and VW indicators. Chinese and U.S. companies show a similar pattern of recovering FSTS-EW but declining FSTS-VW. The only economies showing a downward FSTS trend along both EW and VW are Canada, Hong Kong, and India. Thus, this paper shows that different metrics tell different stories. Researchers should be much more precise in specifying their metrics and in measuring DOI.

Third, the FATA downward trends seemed mainly to be driven by the upshot during 2006-2008 that ended by the global financial crisis. Further, FATA levels, of both metric types, have stabilized since 2020 until 2022.

In sum, economies typically underwent different and sometimes contrasting paths in globalization trajectories, whether or not the grand aggregate trends are stable. This pattern results from a changing gear of underlying key drivers of the economies (Hanson, Lind, & Mendler, 2015), i.e. different periods of upward movement in the grand aggregate are likely to be driven by different economies.

The fourth contribution of this paper is that, although the evidence for deglobalization is at best partial, our additional analyses of TSTA and FSTA suggest that MNEs have over the past decade fundamentally restructured. Today, MNEs generate more foreign sales with much smaller portions of foreign assets. Future research will have to assess the reasons and implications of these findings.

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Tables and Figures

Table 1. Summary statistics of main variables

Sales and assets are in USD billions. Foreign Sales over Total Sales (FSTS), Foreign Assets over Total Assets (FATA), Total Sales over Total Assets (TSTA), Foreign Sales over Foreign Assets (FSFA) are in percentage points. Note that Foreign Sales (FS) and Foreign Assets (FA) contain missing values that, as detailed in our data and method section, have been coded to zero in FSTS and FATA calculation, but not in FSFA.

Panel A. Grand Aggregate Across 16 Economies

	N	mean	median	sd	min	max
Sales	35042	18.37	6.01	34.62	0.1	611.29
Assets	35042	78.54	10.11	287.75	0	6052
Foreign Sales	24140	10.07	3.1	21.67	-10.09	324.7
Foreign Assets	17175	25.63	2.35	115.88	0	2415.64
FSTS	35042	34.66	26.34	34.31	-29.09	100
FATA	35042	15.49	0	24.23	0	100
TSTA	35042	65.5	73.62	34.49	0.31	100
FSFA	17168	5.39	1.5	14.42	-10.94	100

Panel B. Individual Economy Aggregate: Mean and Standard Deviation

	Sales	Assets	Foreign Sales	Foreign Assets	FSTS	FATA	TSTA	FSFA
BRAZIL	6.9 (13.3)	21.7 (63.9)	3.8 (7.2)	8.8 (10.3)	11.2 (23.6)	2.4 (11.0)	61.7 (29.5)	3.5 (11.8)
CANADA	9.7 (10.5)	55.6 (152.5)	5.6 (7.6)	24.8 (74.2)	38.6 (35.1)	21.6 (25.3)	60.5 (35.4)	3.3 (9.3)
CHINA	30.5 (50.1)	182.1 (558.0)	8.0 (19.2)	75.2 (200.0)	12.0 (22.2)	4.2 (14.7)	66.2 (35.1)	6.9 (17.4)
FRANCE	23.5 (30.8)	112.5 (356.0)	13.3 (21.2)	45.2 (145.9)	51.8 (29.0)	17.3 (25.0)	68.9 (30.6)	3.5 (10.5)
GERMANY	26.2 (35.8)	98.2 (242.8)	19.1 (29.7)	18.5 (63.4)	43.6 (33.1)	18.6 (23.7)	67.4 (35.5)	3.5 (7.0)
HONG KONG	5.7 (8.2)	20.0 (40.9)	3.7 (7.2)	7.9 (20.0)	41.3 (38.7)	26.3 (30.2)	58.9 (36.8)	3.9 (13.0)
INDIA	6.5 (10.7)	21.6 (51.8)	3.0 (6.2)	4.6 (9.0)	15.6 (27.2)	6.5 (14.4)	58.0 (36.1)	5.1 (12.1)
ITALY	7.8 (17.6)	45.3 (141.3)	4.5 (12.0)	23.0 (110.0)	33.6 (35.0)	8.6 (18.6)	55.0 (34.4)	4.7 (15.0)
JAPAN	34.6 (31.0)	151.4 (466.1)	15.8 (22.2)	18.3 (54.1)	27.5 (26.2)	11.2 (16.0)	73.5 (31.6)	4.7 (8.5)
KOREA (SOUTH)	13.6 (21.1)	33.1 (68.8)	8.3 (20.2)	3.4 (7.8)	20.9 (28.4)	4.4 (10.0)	73.6 (30.1)	6.6 (14.4)
NETHERLANDS	9.3 (20.9)	37.7 (154.6)	7.3 (18.0)	21.7 (114.6)	50.5 (35.1)	26.4 (31.4)	71.8 (34.2)	3.8 (10.8)
SPAIN	6.3 (13.8)	40.7 (163.7)	3.7 (8.2)	24.3 (117.0)	37.8 (31.3)	19.4 (29.0)	56.5 (34.4)	5.3 (17.5)
SWITZERLAND	10.0 (21.7)	55.0 (201.7)	7.2 (16.0)	31.2 (164.8)	56.0 (33.8)	25.2 (26.7)	67.0 (35.6)	4.0 (9.6)
TAIWAN	6.4 (13.7)	16.7 (38.1)	5.0 (15.2)	1.4 (4.4)	38.3 (36.7)	14.3 (21.2)	71.6 (33.6)	16.4 (29.5)
U.K.	24.5 (45.1)	126.5 (372.1)	16.2 (34.2)	58.1 (215.7)	49.5 (35.0)	31.3 (30.2)	68.1 (34.6)	2.0 (4.0)
U.S.	74.1 (66.4)	243.6 (511.2)	28.9 (36.2)	40.8 (111.6)	26.6 (24.8)	10.3 (16.5)	69.5 (34.9)	7.5 (14.8)

Figure 1a. Trends of Equally-Weighted (EW) Measures: First Set of Eight Economies by Alphabetical Order

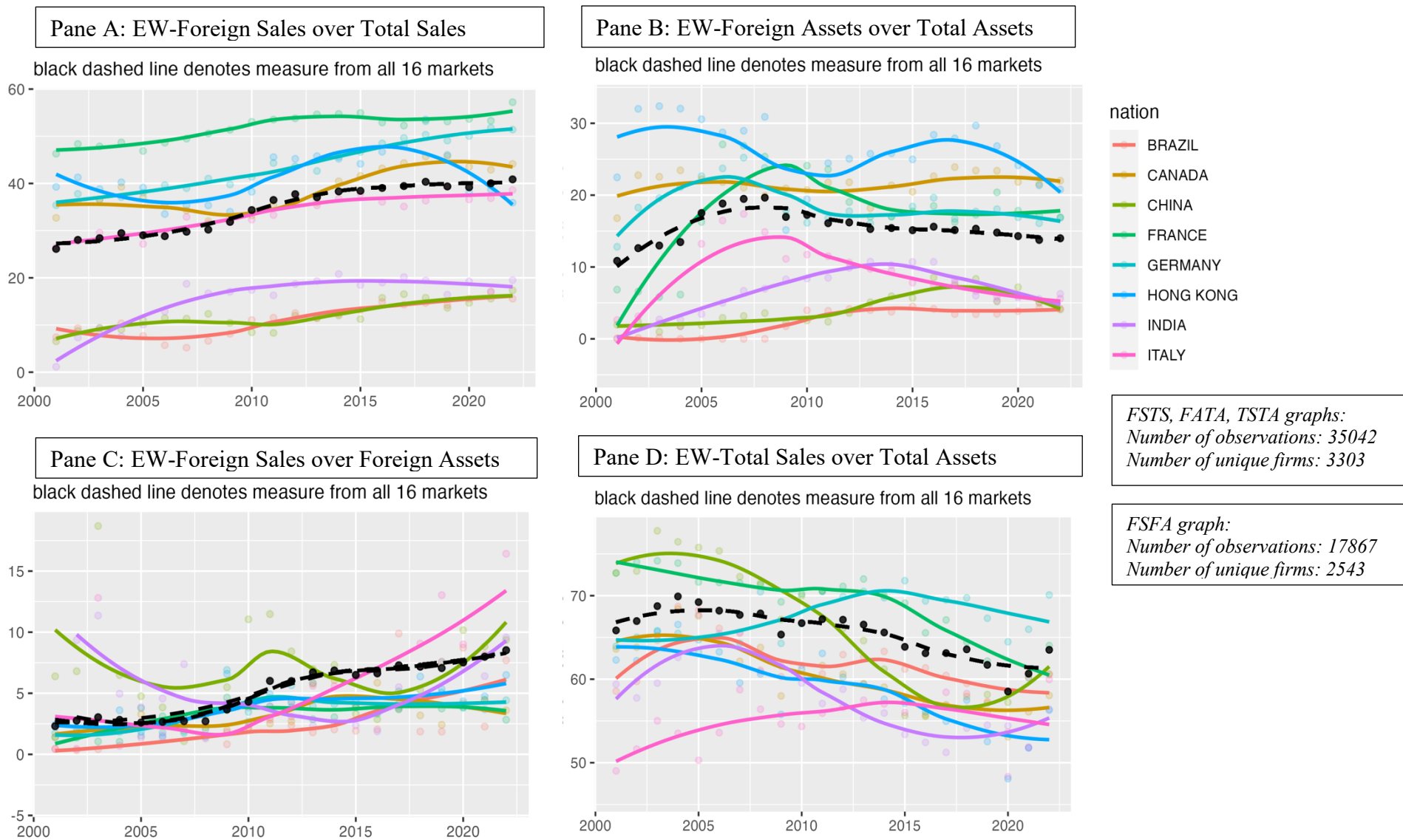


Figure 1b. Trends of Equally-Weighted (EW) Measures: Second Set of Eight Economies by Alphabetical Order

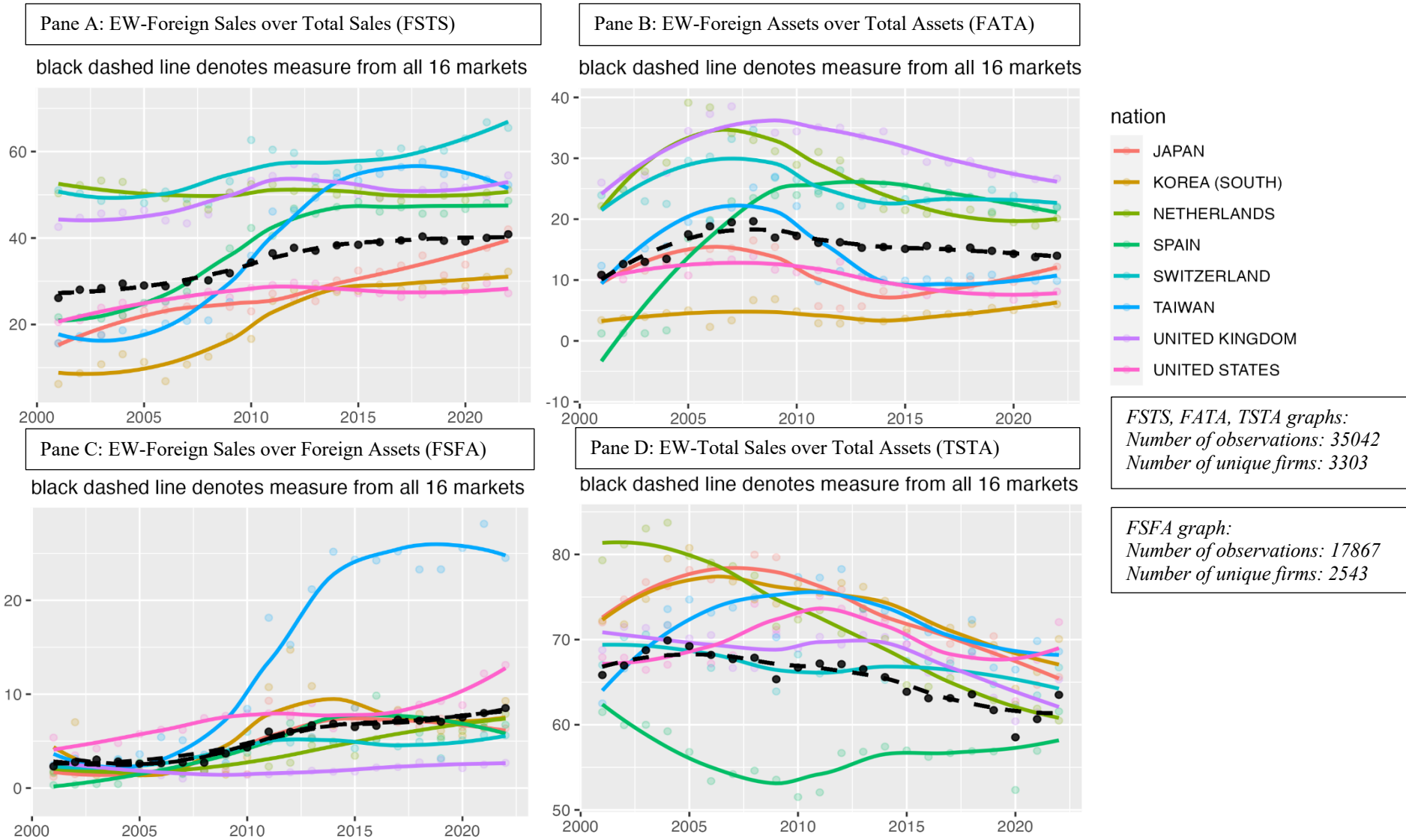


Figure 2a. Trends of Value-Weighted (VW) Measures Weighted by Total Sales: First Set of Eight Economies by Alphabetical Order

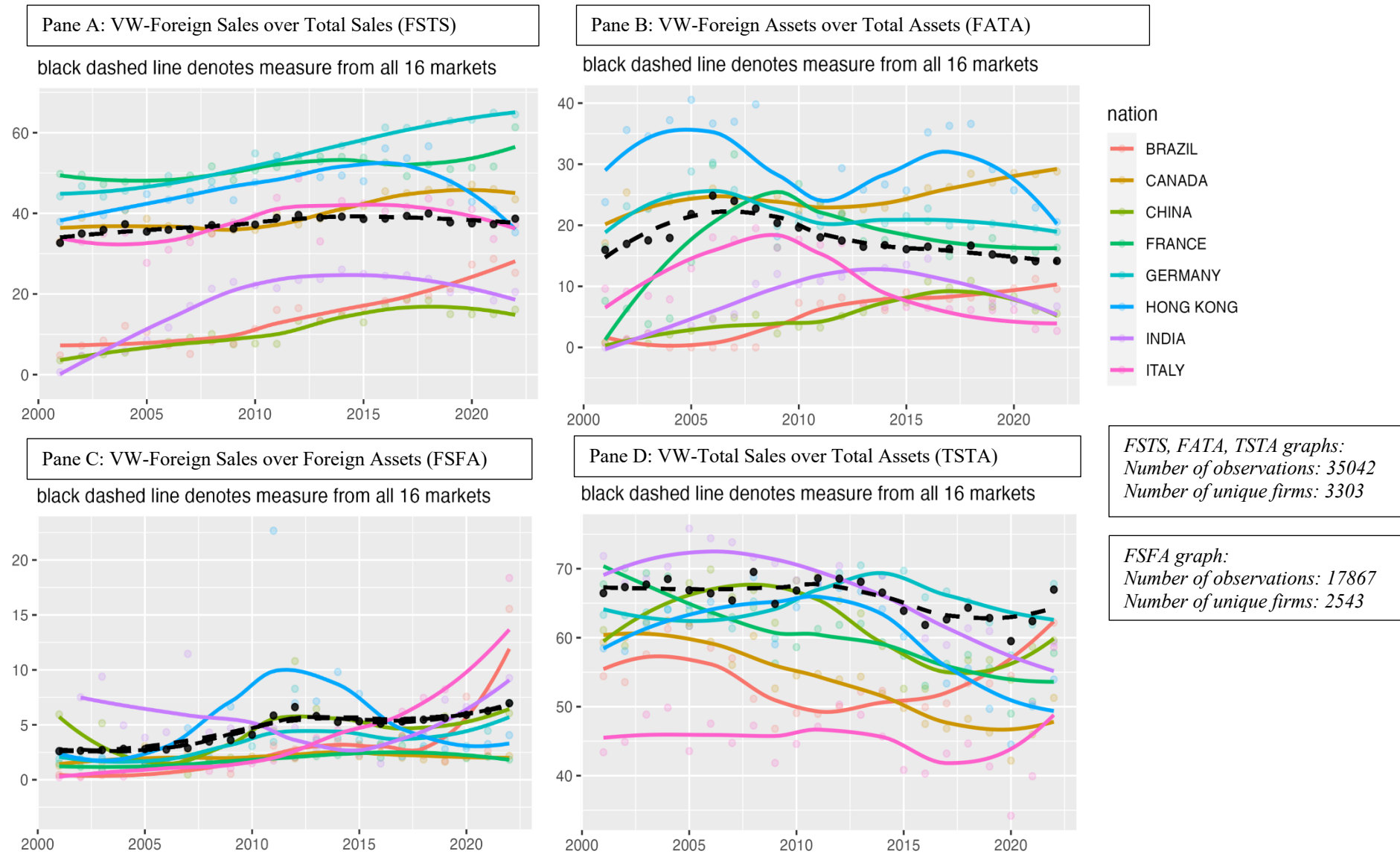


Figure 2b. Trends of Value-Weighted (VW) Measures by Total Sales: Second Set of Eight Economies by Alphabetical Order

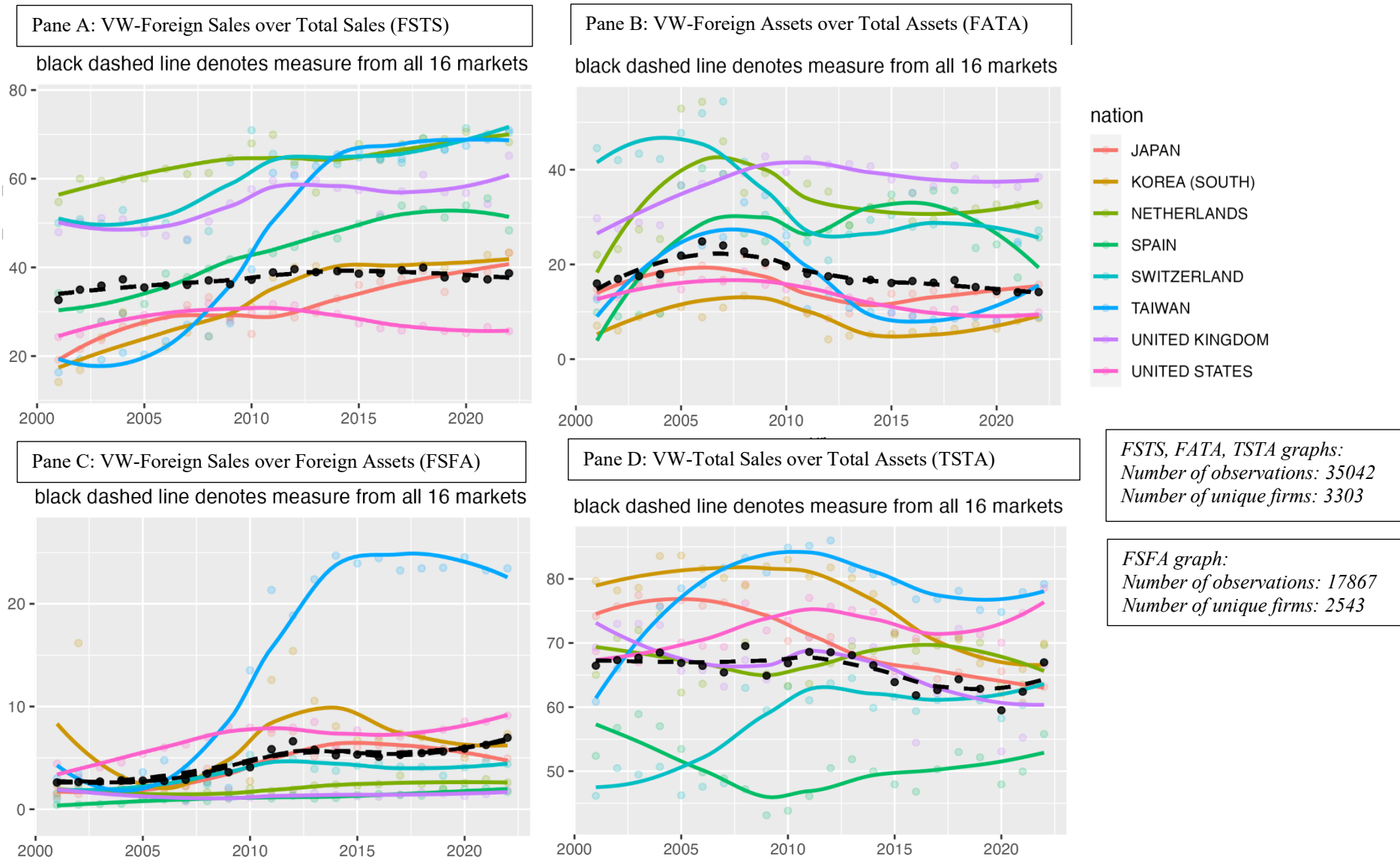
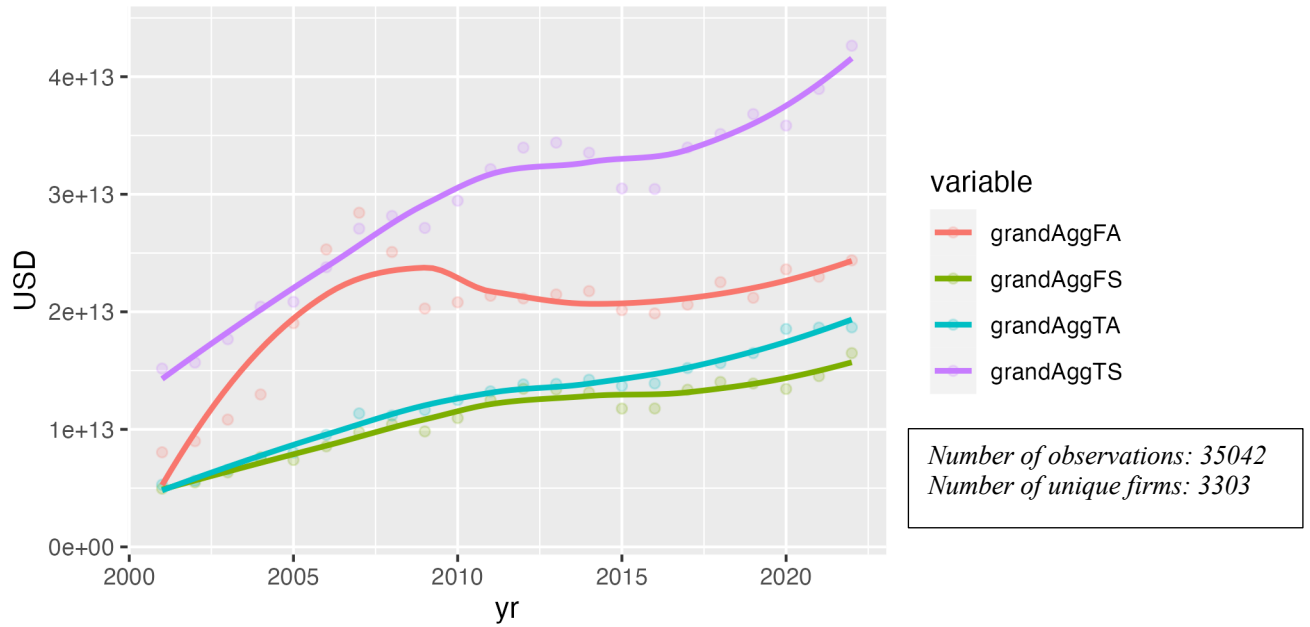


Figure 3. Trends of Sales and Assets: Grand Aggregates of Foreign and Total

Grand aggregate from all 16 economies: sales and assets

F for foreign, T for Total: TA divided by 10 to put in comparable scale





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MS0134: Uncertain Business: The Influence of Geopolitical Risks on New Venture Formation

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Uncertain Business: The Influence of Geopolitical Risks on New Venture Formation

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Extended Abstract

This study explores the impact of geopolitical risks on venture creation and how governance quality moderates this relationship. Using global data from 42 countries and year from 2006 to 2023, the research applies fixed-effect regression and two-step difference GMM to analyze country-level dynamics. The findings reveal that high geopolitical risks significantly reduce venture creation, but strong governance can mitigate these negative effects. This study expands institutional theory by integrating geopolitical risks and suggests that governance quality acts as a central role in alleviating uncertainty for venture creation. The insights are valuable for policymakers aiming to support entrepreneurship through improved governance amid geopolitical challenges.

Keyword: Geopolitical Risks, Governance Quality, Venture Creation, Institution Theory

1. Introduction

In 2018, the United States initiated a trade war with China, marking the start of escalating geopolitical tensions. These risks have further intensified with the Ukraine-Russia conflict, impacting international business, especially between the U.S. and China, through supply chain disruptions, declining foreign investments, and fluctuating exchange rates (Cuéllar et al., 2023). As a result, entrepreneurs and institutions face increased uncertainty (Carney, 2016).

Prior research has explored how international political dynamics affect economic systems, focusing on networks, trade, and industrial policies (Clayton et al., 2023). Institutional entrepreneurship studies have shown how political and economic structures influence venture quality and productivity (Amorós et al., 2019; Autio & Fu, 2015). However, few studies have directly examined geopolitical risks, likely due to challenges in measurement (Caldara & Iacoviello, 2022). Geopolitical risks encompass crises beyond terrorism, including regional conflicts, migration, and energy disruptions (Flint, 2021). Despite these challenges, little is known about how entrepreneurs perceive and respond to these risks.

This paper develops a framework grounded in geopolitical risk and institutional theory to explore the relationship between geopolitical risks and entrepreneurship. Using the Caldara and Iacoviello Geopolitical Risk Index (2022), the study examines whether governance quality moderates the impact of geopolitical risks on entrepreneurship. Using country-level panel data (2006-2023), the findings suggest that geopolitical risks reduce venture creation, but strong governance can alleviate these negative effects.

2. Literature and framework

2.1. Institution Changes in the Geopolitical Risks and New Venture Formation

The influence of institutions on economic development and entrepreneurship is well established. North (1990) describes institutions as the "rules of the game" that shape human behavior through formal and

informal constraints. These include regulatory environments, cultural norms, and cognitive frameworks that influence entrepreneurial decisions (Aldrich & Fiol, 1994). Studies have shown that institutions shape venture types, risk tolerance, and economic structures, such as tax policies and insolvency laws (Amorós et al., 2019; Chowdhury et al., 2019).

Political structures also significantly influence entrepreneurship, but research on how geopolitical risks specifically affect entrepreneurship is limited (Caldara & Iacoviello, 2022). Geopolitical risks, such as military conflicts or regional tensions, increase uncertainty, making entrepreneurs more cautious (Caldara & Iacoviello, 2022).

Hypothesis 1: The higher the geopolitical risks, the lower the level of entrepreneurial activities.

2.2. Governance Quality Relieves the Impact of Geopolitical Risks on Entrepreneurship

Governance quality, which includes regulatory environments, government effectiveness, and corruption control, plays a crucial role in setting the rules for economic activities (Fredström et al., 2021). Strong governance promotes investment and entrepreneurship by protecting property rights, increasing transparency, and lowering transaction costs (Autio & Fu, 2015; Li & Zahra, 2012)

Hypothesis 2: Governance quality moderates the negative relationship between geopolitical risks and entrepreneurial activities—the higher the governance quality, the weaker the negative impact of geopolitical risks.

3. Method and results

This study investigates the impact of geopolitical tensions on venture creation at the country level, measured by the number of ventures created per million people (log-transformed). The Caldara & Iacoviello Geopolitical Risk Index (2022) tracks geopolitical tensions using media data, while governance quality is measured using the World Governance Indicators (WGIs) from the World Bank.

Control variables include government spending, GDP growth rate, labor force participation, venture capital development, trade, and FDI, sourced from World Development Indicators and SDC Platinum. Data is analyzed using fixed-effects regressions, with one-year lagged variables, and two-step difference GMM for robustness.

The fixed-effects regression (Table 1) shows that geopolitical risk significantly reduces entrepreneurship ($\beta = -0.389$, $p < 0.05$), supporting Hypothesis 1. The interaction between geopolitical risk and governance quality is positive and significant ($\beta = 0.291$, $p < 0.05$), supporting Hypothesis 2. GMM results (Table 2) confirm the model's robustness.

4. Discussion

This study provides new insights into how geopolitical risks impact entrepreneurship, showing that governance quality mitigates these effects. The findings confirm that geopolitical risks reduce venture creation, as entrepreneurs face heightened uncertainty in politically unstable environments. This adds to both geopolitical risk literature and institutional theory, demonstrating that strong governance can buffer against the negative effects of instability.

The research highlights two key points: first, geopolitical risks significantly challenge entrepreneurial ventures by introducing unpredictability, even for typically risk-tolerant entrepreneurs. Second, governance quality plays a crucial role in reducing uncertainty, making it a key factor in fostering entrepreneurship during geopolitical tensions. For policymakers, strengthening governance frameworks can help support entrepreneurial activities even in the face of geopolitical risks.

Table 1. Panel fixed-effects estimator with Venture Creation (log-transformed) as dependent variable.

Variables	Venture Creation (log transformed)		
	Model 1	Model 2	Model 3
Geopolitical risk		-0.389*	-0.318*
		(0.166)	(0.157)
Governance quality		-0.062	-0.138
		(0.407)	(0.394)
Geopolitical risk x Governance quality			0.291*
			(0.143)
Government spending (natural log transformed)	-1.412 *** (0.399)	-1.480*** (0.380)	-1.488*** (0.372)
GDP growth	0.0216 † (0.0122)	0.0160 (0.011)	0.015 (0.011)
Labor force participation rate	0.0311 (0.021)	0.035 † (0.020)	0.034 (0.020)
The number of VC	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
VC investment (natural log transformed)	0.0261 (0.042)	0.014 (0.035)	0.007 (0.034)
Trade	0.004 (0.003)	0.003 (0.003)	0.003 (0.003)
FDI	0.000 (0.001)	0.000 (0.002)	0.000 (0.002)
Constant	33.077	34.726	35.062
Year Dummies	Yes	Yes	Yes
R-squared	0.899	0.898	0.902
Observations	640	640	640
Groups	42	42	42
F-test	0.000	0.000	0.000

***p < 0.001, **p < 0.01, *p < 0.05, †p < 0.1; two-tailed t-tests, robust standard errors are shown in parentheses.

Table 2. The coefficient of lagged DV (Venture creation) in model 4 and 5.

Lagged venture creation	Model 4	Model 5
Pooled OLS coefficient	0.713***	0.708***
Fixed effect coefficient	0.255***	0.245***
One-step coefficient	0.391***	0.344***

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.1$; two-tailed t-tests.

Table 3. Difference GMM estimators with Venture Creation (log-transformed) as dependent variable.

Variables	Difference GMM Venture Creation	
	Model 4	Model 5
Lagged venture creation (log transformed)	0.193*** (0.039)	0.163*** (0.040)
GPRC	-0.209** (0.068)	-0.303*** (0.086)
WGI	-0.995** (0.321)	-1.416* (0.593)
GPRC x WGI		0.289** (0.101)
Year dummies	Yes	Yes
Additional controls	No	No
Observations	485	526
Groups	42	42
F-statistic	16209.06	14735.04
Hansen J-test (p-value)	0.724	0.998
Number of instruments	58	75
Arellano-bond AR (1) (p-value)	0.000	0.000
Arellano-bond AR (2) (p-value)	0.984	0.954

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.1$; two-tailed t-tests, robust standard errors are shown in parentheses.

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MS0135: Interpersonal Trust and Knowledge Adoption in China: The Moderating Role of Age

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Interpersonal Trust and Knowledge Adoption in China: The Moderating Role of Age

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Introduction

Despite being exposed to knowledge management (KM) for over two decades and aspiring to become a knowledge-based economy (Augier et al., 2016), China lags behind developed nations in adopting and practicing KM (Milton, 2016), and most Chinese companies have been slow in embracing KM (Liu et al., 2019). While the extant research has shown that both Chinese and foreign firms operating in China can benefit from increased knowledge sharing (KS) in managing innovation and an aging workforce (Akram et al., 2018; Ye et al., 2021), how to promote and benefit from KS remains poorly understood, despite numerous KM studies conducted in China (Lin & Dalkir, 2010; Martinsons et al., 2017). Previous China-based studies have focused on knowledge hoarding (lack of willingness to contribute knowledge) and its determinants (Peng, 2013; Xiao & Cooke, 2018), even though lack of motivation to adopt knowledge from others was once found to be among the top three barriers to KS in China (Su et al., 2010). Regarding what influence knowledge adoption (KA) at the workplace in China, the existing literature is limited, paying scant attention to interpersonal factors such as social trust and relationship, while recent research on KM failures in China showed that Chinese employees placed more value on knowledge obtained from informal exchanges (Martinsons et al., 2017). To the extent that effective KS depends on KA as well as knowledge contribution (KC) (Cleveland & Ellis, 2015; Jin et al., 2021), more knowledge of what determines KA helps increase our understanding of how to promote and benefit from KS in China. Toward this end, the current study focused on the KA process in KS and sought to explore the influence of interpersonal trust on Chinese employees' propensity to adopt knowledge contributed by their peers in the workplace. Unlike prior KS studies based primarily on the Western view of affect-based trust (one main type of interpersonal trust), this study investigated the impact of sincerity-based trust unique to the Chinese society on KA. Furthermore, in view of the influence of age on interpersonal trust and KS found

in prior studies (Burmeister et al., 2018; Nguyen et al., 2019), this investigation also explored the moderating role of age in the relationships between interpersonal trust and KA in China.

Literature and Framework

Determinants of Knowledge Adoption

Early research on what affect KA revealed several reasons why individuals were reluctant to accept or adopt knowledge from others at the workplace. One of them is the ‘not-invented-here’ mentality (Davenport & Prusak, 1998) which can lead to rejection of knowledge coming from an outside source (Al-Ani et al., 2011). Adopting peer knowledge can also carry financial, psychological, social, and performance risks (Desouza et al., 2006). Using help from others admits incompetence, ignorance, inferiority, and dependence, which may tarnish one’s self-esteem and image within an organization (Nadler et al., 2003). Subsequent research on KA determinants has identified content quality or source creditability as another important factor that determines the perceived usefulness of the knowledge contributed and consequently its adoption. (Jin et al., 2021; Liao & Chou, 2012; Zheng et al., 2013). In addition, the knowledge receiver’s personal relationship or experience with the knowledge contributor can affect the former’s KA attitudes and intentions (Hertzum, 2014; Woudstra & van den Hooff, 2008) because extensive relationships or experiences between the two parties are conducive to the extra efforts needed to ensure the knowledge receiver’s understanding and use of the knowledge (Levin & Cross, 2004). Closely related to social relationships or ties, interpersonal trust and its potential impact on KA have received some attention in the literature. While this body of research reveals a mediating role of interpersonal trust (Evans et al., 2019), the evidence for its direct effects on KA is mixed (Balogun & Adetula, 2015; Holste & Fields, 2010). Another factor that may affect KA is the age of the knowledge receiver. Younger employees tend to be more motivated to accept knowledge from others than the older ones in that the former have a stronger desire for personal growth and new experience than the latter (Dietz et al., 2021). In contrast, older employees are more likely to resist change, especially if it contradicts their existing knowledge, and are less able to learn (Ng & Feldman, 2012). The evidence from a study conducted in Germany supported the negative impact of age on KA (Burmeister et al., 2018).

Interpersonal Trust and Knowledge Adoption

The trust research has identified two main bases of interpersonal trust: cognition and affect (Mayer et al., 1995; McAllister, 1995). Cognition-based trust reflects a trustor's evaluation of the trustee's competence, credibility, and dependability. In contrast, affect-based trust reflects the trustor's emotional bond (including care and concern) with the trustee as well as the latter's benevolence and integrity. While acknowledging both types of interpersonal trust as important factors in Chinese relationships (*guanxi*), scholars on trust in China argue that Chinese affect-based trust differs from its Western counterpart in the former's emphasis on the sincerity and honesty of the trustee (Chen & Chen, 2004; Khan et al., 2015). A person is considered trustworthy if he or she is perceived as sincere, honest, reliable and capable (Chen & Chen, 2004), and sincerity means that the trustee has the best intention to form and stay in the relationship and has the trustor's best interest at heart (Yang, 2001). Trust in one's sincerity and honesty is the primary concern in trustworthiness (Chen & Chen, 2004) and can be viewed as deep trust (Kriz & Keating, 2010). The current investigation examined and tested the effects of sincerity-based and cognition-based trust on KA of two main types of knowledge (explicit and tacit). Explicit knowledge is easy to articulate, decode, and capture in words and documents (Nonaka & Konno, 1998). In contrast, tacit knowledge (e.g., motion-based skills and intuition) tends to be hard to articulate and document (Polanyi, 1967). Chinese employees who trust the sincerity and honesty of a knowledge source would feel less concerned or embarrassed by using others' knowledge and even become willing to take more risk (Mayer et al., 1995). Sincerity-based trust may also alleviate the not-invented-here syndrome by decreasing negative affective feelings about an external knowledge source. In addition, Chinese employees with deep trust in each other's sincerity and honesty are likely to develop strong bonds and experience positive interactions, which ensure that the knowledge contributor is willing to make extra efforts needed to help the knowledge receiver understand and use the knowledge (Hertzum, 2014; Levin & Cross, 2004). Strong interpersonal relationships are especially important to tacit knowledge-sharing which requires the two parties involved to develop shared mental models, values, and perceptions through close interactions and exchanges to help the knowledge receiver to learn and internalize tacit knowledge from the knowledge contributor (Nonaka, 1994).

Cognition-based trust can be conducive to KA by increasing the knowledge receiver's belief in the credibility, quality and relevance of the knowledge source (Levin & Cross, 2004; Zhang & Chen, 2018). Higher confidence in the competence and reliability of the knowledge source can remove or reduce some barriers to KA. The knowledge receiver would be less worried about the performance risk from the adopted knowledge and, hence, more willing to learn and act on that knowledge (Levin & Cross, 2004). More trust in the competency of the knowledge source may also alleviate the influence of the 'not-invented-here syndrome' partially caused by lack of trust in an outside knowledge source (Husted & Michailova, 2002) and even lead one to question the superiority of internal knowledge. Some evidence from the U.S supports the positive effect of cognition-based trust on tacit knowledge use (Holste & Fields (2010). In sum, cognition-based trust can influence the perceived usefulness of the explicit or tacit knowledge contributed by others (Jin et al., 2021; Liao & Chou, 2012).

Hypothesis 1: Sincerity-based trust is positively related to explicit KA.

Hypothesis 2: Sincerity-based trust is positively related to tacit KA.

Hypothesis 3: Cognition-based trust is positively related to explicit KA.

Hypothesis 4: Cognition-based trust is positively related to tacit KA.

Moderating Role of Age

Prior research has shown that the age of the knowledge receiver may interact with other factors in conditioning their effects on KC and KA. A meta-analysis of 44 academic papers published between 2000 and 2017 found age moderating the relationship between an extrinsic motivation factor (reciprocity) and KC (Nguyen et al., 2019). Using data collected from 450 German workers, Burmeister et al. (2018) also reported age differences in the effects of trustworthiness (a combination of both affect-based trust and cognition-based trust) on KC and KA. For the older workers, trustworthiness influenced both KC and KA less than for the younger workers. In the present study, both types of interpersonal trust were expected to exert stronger influence on older Chinese employees' propensity to adopt knowledge from their peers for the following reasons. As implied in age norms (Burmeister et al., 2018), younger employees tend to perceive themselves as knowledge receivers while older employees are expected to be knowledge senders. The influence of implicit age norms can be stronger in a high-power distance and Confucian

society like China where younger people are taught to respect and learn from older people as well as their expertise. Older employees, on the other hand, need the right conditions to adopt knowledge from others and learn (Dietz, et al., 2021) and thus may be more subject to the influence of interpersonal trust. As Burmeister et al. (2018) noted, high levels of affect- and cognition-based trust in the knowledge source can partially negate the impact of implicit age norms and role expectations on older employees by reducing risks associated with KA. Age was then expected in this study to moderate the relationships between both types of interpersonal trust and both types of KA, such that the positive effects of such trust would be stronger for older employees.

Hypothesis 5: For older employees, the relationship between sincerity-based trust and explicit KA is stronger than for younger employees.

Hypothesis 6: For older employees, the relationship between sincerity-based trust and tacit KA is stronger than for younger employees.

Hypothesis 7: For older employees, the relationship between cognition-based trust and explicit KA is stronger than for younger employees.

Hypothesis 8: For older employees, the relationship between cognition-based trust and tacit KA is stronger than for younger employees.

Method and Results

The data for testing the research hypotheses were collected from a survey conducted in China during the pandemic. The sample frame consisted of 191 full-time employees from a Sino-U.S. joint venture in Eastern China. Ninety respondents (47%) were 20-30 years old, while one hundred and one (53%) were over the age of 30. The gender split was almost even. One hundred and fifty-three (80%) of the respondents had at least three years of work experience in the company. Eleven items were used to measure the main variables on a Likert scale ranging from 1 = *strongly disagree* and 7 = *strongly agree*. Three items were developed from Chen & Chen (2004) to measure sincerity-based trust. Cognition-based trust was measured with three items adopted from Mayer et al. (1995) and McAllister (1995). In keeping with Holste & Fields (2010), explicit KA was measured with two items and tacit KA with three items. The construct validity of the survey instrument was assessed with a confirmatory factor analysis in structural equation modeling run on AMOS 26.0. The default model of four factors fits the data better than two other nest models of three factors each with the best key good-fit ratios among the three models: $\chi^2(45)$

=1.60, GFI =.93, CFI =0.99, TLI =0.98, IFI =0.99, and RMSEA = 0.06 (Harrington, 2009). The reliabilities (Cronbach's alpha) of the four key factors (sincerity-based trust, cognition-based trust, explicit KA, and tacit KA) were 0.92, 0.86, 0.98, and 0.96 respectively. The moderator (age) was measured with a binary variable ($1 = \text{over } 30 \text{ years}$, and $0 = 20\text{-}30 \text{ years}$).

Two moderated regression analyses were performed to test the main and interactive effects on explicit KA and tacit KA. Sincerity-based trust and cognition-based trust were positively related to both explicit KA and tacit KA respectively at the .01 significance level. Thus, Hypotheses 1-4 were supported. The interactive term between age and sincerity-based was significantly related to explicit KA and tacit KA at the .01 level. The interaction between age and cognition-based trust did not significantly predict either explicit KA or tacit KA. Hence, Hypotheses 5 and 6 were supported while Hypotheses 7-8 were not.

Discussion

This study increased our understanding of the influence of interpersonal trust on KS in China by linking sincerity-based trust to Chinese employees' propensity to adopt knowledge contributed by their peers at the workplace. This linkage is stronger among older employees (aged 30 or older). Therefore, Chinese firms need to pay attention to KA and its determinants such as sincerity-based trust and age in order to benefit from KS. Trusting coworkers' competence and reliability is equally important to KA in China since this type of trust affects how knowledge receivers, regardless of their ages, evaluate the credibility and quality of a knowledge source. This study also adds to the research on the KA impact of interpersonal trust by generating additional evidence from another country, which is conducive to our understanding of how affect-based trust and cognition-based trust affect KA in different cultural settings. Moreover, the moderating effects of age found in the study support similar hypotheses in Burmeister et al. (2018), but contradict their findings. It appears that the overriding effect of affect-based trust on implicit age norms and other barriers to KA among older employees is more salient in China where trust in one's sincerity and honesty is deemed more important. More research is needed to reconcile the different findings from these two studies and ascertain the impact of affect-based trust on older employees' KA behaviors.



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MS0136: The Varied Effects of Geopolitical Risk on the Exports, FDI and Patenting of Chinese Multinationals

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The Varied Effects of Geopolitical Risk on the Exports, FDI and Patenting of Chinese Multinationals

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Abstract

Much of the evidence for ‘decoupling’ fails to differentiate between industry sectors in analyses of the effects of heightened geopolitical uncertainty on the structures and behaviour of multinational enterprises (MNEs). This study examines patterns of exports, outward foreign direct investment (OFDI) and the international patenting activities of a large sample of Chinese manufacturing MNEs from 2004 to 2022. After unprecedented growth across all these indicators of internationalisation, we see dramatic changes following the start of the US-China trade war. But an industry sector approach reveals significant heterogeneity, indicating that a complex range of factors determine MNE responses to increased risk.

Keywords:

Chinese firms, internationalisation, international patenting.

Introduction

A long period of post-war trade liberalisation which has supported internationalisation, innovation and economic growth, has come to an end in face of wider geopolitical challenges and an international trade war (Geng and Saggi, 2022; Coelli et al., 2022). The relative absence of trade and investment barriers over the past 20 years have also supported China’s growing involvement in global value chains, evidenced by the unprecedented increase in Chinese exports and a rapid rise in outward

foreign direct investment (OFDI). Alongside this, Chinese firms have increased the number of international patents they have filed, across a widening range of countries, and China has become the largest patent producer (responsible for 47 percent of all worldwide applications; WIPO, 2023). As the global innovation ecosystem has become more complex and interdependent, Chinese multinational enterprises (MNEs) have developed more advanced technological capabilities and played a stronger role in this system (Boeing et al., 2024).

Barriers to trade and investment were already rising globally, when President Trump started a trade war in 2018, with the main aim of limiting US imports of industrial goods from China. The average tariffs on goods trade between China and the United States increased between three- and sixfold, depending on the industry sector and product category. This was part of a more general rise in global trade restrictions, from around 650 new restrictions in 2017 to more than 3,000 in 2023. During this period the US reduced its dependence on China and other trade partners, resulting in an 18% fall in the ‘concentration’ of imports by origin (Seong et al., 2024; WIPO, 2023). But the data shows that Chinese exports and FDI overall have not declined but the composition and direction of trade has changed and when we examine changes in OFDI and patenting the evidence suggests a more complex set of country-specific and sector-specific influences are at play.

Literature and framework

Both the market-related and the technological drivers of MNE strategy and structure need to be examined in tandem to understand how global value chains are being reconfigured by the current global economic environment. A firm might increase exports and / or FDI into a target market alongside investments in technology-sourcing and local patenting (e.g. to secure IPR for locally adapted products). Alternatively, these initiatives take place in separate markets, driven by different factors (Collinson et al., 2024). The majority of MNE studies tend to separate analysis of export and FDI trends from analysis of the geographic diversification of technological activities. This study combines them to gain a more complete view of the factors underlying new patterns of internationalisation in Chinese MNEs.

In theory, increased tariffs should lead to a decrease in exports and increased OFDI. International patents may or may not be needed to protect ownership assets (Oa) in a firm-specific assets (FSA) framework (Geisler Asmussen, Chi and Narula, 2022). Studies that have examined the links between international patent protection and trade generally find a positive relationship. That is, patent protection in the target market correlates with higher levels of exports (De Rassenfosse et al., 2022). But other factors, including additional costs and complexity of exporting, can overshadow this relationship. Prior studies also emphasise the importance of industry sector differences in both the technological drivers and the market drivers of (de)internationalisation. In fact, evidence for the heterogeneity of patenting behaviour was established in the early 1990s (Patel and Pavitt, 1991) but more recent studies have tended to ignore this and focus on aggregate trends. A recent exception, which examines the impacts on patenting and innovation performance in Chinese MNEs (Han, Jiang and Mei, 2024), confirms that differentiating the effects by industry sector is important for revealing differences in firm-level responses to sanctions. The known effects of technological competition over a patent on the firm's choice of patenting strategy, also vary considerably by industry sector (Capelli et al., 2023). For these reasons we also examine the different effects of technological and market-related on specific industry sectors.

Method and results: A Comparative Study of Exports, FDI and Patenting of Chinese MNEs

Longitudinal data on the international patenting activity of 649 high-tech Chinese multinational enterprises (MNEs) between 2004 and 2022 is compared to other key 'outcome' measures of internationalisation, exports and OFDI. We then compare each of these to changing patterns of trade sanctions, tariff and non-tariff barriers imposed on China (primarily by the US) in recent years, alongside indicators of political risk and uncertainty over the 2004-2022 timeline.

Nearly half of all global patent applications are from Chinese firms, but the country's growth rate dipped for a second consecutive year from 6.8% in 2021 to 3.1% in 2022 (WIPO, 2023). Non-resident filings, that is Chinese firms taking out patents in foreign patent offices, have almost entirely focused on the following regions: the US, European Patent Office (EPO), Japan, Republic of Korea, India,

Canada, Australia, Germany, and the Russian Federation. The first three accounted for 82% of the total in 2022. This pattern has been stable for over a decade, although the US accounted for 57% in 2016, and its share declined to 52% in 2022 (WIPO, 2023). Our study focuses on the five leading countries, the US, Japan, the Republic of Korea, India and Australia, with the highest numbers of patent filings from China in 2022.

The study explicitly compares the longitudinal data across different industry sectors. Moreover, because 80% of China's international patents are from high-tech MNEs, we chose to focus the analysis on 8 industry sectors which also account for the major proportion of China's physical goods exports: manufacturing of chemical raw materials and chemical products, pharmaceutical manufacturing industry, general equipment manufacturing, special equipment manufacturing industry, automobile manufacturing industry, electrical machinery and equipment manufacturing, computer, communications and other electronic equipment manufacturing, software and information technology services.

Initial Findings

This is an exploratory work in progress, but early findings show that recent geopolitical challenges have significantly affected the international patenting activities of our sample of Chinese firms. But there are major differences in the timing of the responses across these 8 industry sectors. Industry and country-specific differences reveal a significant heterogeneity in firm-level responses.

The data on exports from China to the US, Japan, Korea, India and Australia, from 2004 to 2022 shows a predictable pattern of significant growth which has been well-documented. But there is also a steady pattern of international diversification as the proportion of exports going to these five countries declines, relative to the worldwide total. For example, these 5 countries account for 39% of all Chinese automobile product exports in 2004, down to 24% in 2021. Notably the US market imported 26% of all China's exports in this sector in 2004 and just 15% in 2021, with a marked decline in 2018.

Outward FDI from China grew significantly from 2004, peaked in 2016, declined steadily to 2019, increased marginally to 2021 and fell again to 2023 (the most recent data). Again, there are marked differences by industry sector. Recent falls, in line with the patent data we review next, presents us

with a puzzle. Internalisation theory would suggest that increased FDI would result from a growth in tariffs and non-tariff barriers because exporting becomes more costly and/or complex, but this does not appear to have happened. There may well be a time-lag effect, but this raises interesting questions about which key factors are driving firm behaviour.

Regarding the international patenting trends of our sample of Chinese MNEs, from less than 500 filed in 2004 we see a strong growth (over 30-fold, year-on-year), particularly from 2011, to almost 15,000 filed in 2020, then a dramatic fall. Again however, each of the 8 industry sectors analysed show very different peaks between 2012 and 2021, suggesting different factors underlie the trend. For example, in the automotive industry sector there is a high correlation between exporting and local patenting for the US market, but not elsewhere. Moreover, there is a high correlation between OFDI and local patenting, across all countries except for Korea, where there is a negative relationship between these two indicators over the period studied. Contrasting this, Chinese MNEs in the pharmaceuticals industry show a higher tendency to patent in all export markets, but there is a negative correlation between patenting and OFDI in three of our 5 main overseas markets, a neutral (average) correlation in Japan and a highly positive correlation in Korea. There are clearly country-specific and industry-specific factors influencing these trends. Overall, patenting activity is strongest across most sectors if the firm is exporting to the USA and Australia, and the lowest for Japan. The relationship between overseas patenting and OFDI is very mixed by sector and country. We will conduct further statistical analysis on the data sets to reveal more specific and robust relationships and seek to explain these from prior literature and potentially further empirical work.

Discussion, Relevance and Implications

Prior studies show that the relationship between patents and international trade is complex, and depends on an industry-specific combination of local market demand, the structure of trade barriers (tariff, non-tariff, quotas, embargoes, voluntary restraints, environmental or health and safety-related standards, etc.) and a country's innovative potential, in turn related to education levels, R&D funding and capacity, the quality of infrastructure, institutions and government policies (Athreya et al., 2020). Alongside this, patents have a different level of significance for different industry sectors.

Economists also report mixed results when analysing effects of patents and other IPRs on trade. Although the market expansion effect predicts a positive relationship between stronger IPRs and exports there are also market power effects (the additional protection and superior returns afforded patent holders) which predict a negative relationship between stronger IPRs and exports. In general, the evidence supports the first of these, showing a positive relationship between patents and exports, but again there are very different effects across industries.

There are implications from our findings for managers and policymakers concerned with the changing location of technological activities within global value chains, and the factors that influence this. While we see similar trend lines when comparing exports, OFDI and patenting activity, there are very different patterns at the industry sector level. This also provides insights into how emergent MNEs in different industries are influenced by distinctive combinations of factors driving internalisation as they internationalise.

From a policy perspective, trade barriers and patent regulations are policy tools used bilaterally and unilaterally by governments to shape the global economy and the behaviour of MNEs. Bilateral barriers to Chinese exports are having a significant impact on the global economy, including negative effects on economic growth, and a re-shaping of global value chains and the structure of international innovation networks and ecosystems. A deeper understanding of the relationships between both is important for improving the coordination and precision of economic policies.

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MS0138: Company-sponsored and Customer-autonomous Brand Co-creation on Brand Loyalty - An Integrated Perspective of Internal and External Factors

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**Company-sponsored and Customer-autonomous Brand Co-creation on Brand Loyalty ——An
Integrated Perspective of internal and external factors
(Extended Abstract¹)**

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Abstract: In online brand communities, customer engagement in brand co-creation (CE-BCC) includes two types: customer engagement in company-sponsored brand co-creation (CE-CSBCC) and customer engagement in customer-autonomous brand co-creation (CE-CABCC). Through a questionnaire survey of 505 valid samples from the *Xiaomi* brand community, and using SEM for hypotheses testing, our findings indicate that CE-CABCC is a key factor in promoting brand loyalty, while CE-CSBCC has no significant effect on brand loyalty, but CE-CSBCC can facilitate CE-CABCC. In addition, supportive community climate (SCC) and consumer innovativeness (CIN) have positive effects on both CE-CSBCC and CE-CABCC, and SCC indirectly promote both types of CE-BCC through CIN.

Key words: Online Brand Communities; Supportive Community Climate ; Consumer Innovativeness; Customer Engagement in Brand Co-Creation; Brand Loyalty

1. Introduction

Based on the value co-creation theory and the service-dominant logic, some scholars re-examined the roles of customers and brand managers in brand building from a 'co-creation' perspective (Gregory, 2007; Merz & Vargo, 2009). They viewed brand co-creation as a new paradigm of branding. The literature suggests that customer engagement in brand co-creation (hereafter, CE-BCC) has many

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positive effects on brands, such as promoting brand value (France et al., 2020) and brand equity (Kumar, 2021), strengthening self-brand connection (Hollebeek, Glynn & Brodie, 2014), and enhancing brand loyalty (Nadeem, Tan & Hajli., 2021). In online brand communities, CE-BCC includes two types: customer engagement in company-sponsored brand co-creation (hereafter, CE-CSBCC) and customer engagement in customer-autonomous brand co-creation (hereafter, CE-CABCC). However, few studies have distinguished between them and explored their impact on brands. In addition, previous studies have explored the antecedents of CE-BCC from various perspectives (Dwivedi, Wilkie & Johnson., 2016; Hsieh & Chang, 2016; Tajvid, Wang, Hajli & Love, 2021), but few studies have focused on the impact of both personal intrinsic traits and external environmental incentives on CE-BCC from an integrated perspective. To fill these research gaps, we distinguish two types of CE-BCC in online brand communities and explore their impact on brand loyalty (hereafter, BLY). Furthermore, we probe into the driving effects and mechanisms of consumer innovativeness (hereafter, CIN) and supportive community climate (hereafter, SCC) on these two types of brand co-creation.

2. Literature and Hypotheses

The literature suggests that customer participation in online communities can be categorized into active and passive participation (Blazevic & Lievens, 2008; Zwass, 2010), and active customer participation is more meaningful (Roberts and Hann, 2006). We believe that CE-BCC in online brand communities also can be categorized into two types: CE-CSBCC and CE-CABCC. CE-CSBCC refers to customers' engagement in brand co-creation projects that sponsored by the brand company such as brand development, brand evaluation, and brand promotion, while CE-CABCC refers to customers' proactively engagement in brand co-creation such as offering constructive brand feedback, sharing brand experiences and addressing questions from others. In these two types, the degree of customers' dominance and initiative varies. Past research have found that customer engagement in online brand communities not only directly promotes BLY (Nadeem et al., 2021), but also enhances it indirectly through a sense of brand community and commitment to the community (Shin, 2023; Zheng, Cheung

& Lee, 2015). Therefore, we hypothesize:

Hypothesis 1: CE-CSBCC is positively related to BLY.

Hypothesis 2: CE-CABCC is positively related to BLY.

In addition, Matute, Palau-Saumell & Occhiocupo (2021) and Wang, Tai & Hu (2023) confirmed that customer-brand engagement (CBE) in online brand communities positively influences community engagement or customer-to-customer interactions. Based on this, we hypothesize that:

Hypothesis 3: CE-CSBCC is positively related to CE-CABCC.

Consumer innovativeness (CIN) is the propensity of consumers to adopt new products (Hauser, Tellis & Griffin., 2006), reflecting an individual's internal innovative personality, cognitive style, and behavioral tendencies. Prior research have shown that the pursuit of innovativeness positively influences customer value co-creation behaviors including customer participation behaviors and customer citizenship behaviors (Yen, Teng & Tzen J-C., 2020), specifically consumer innovativeness influences customer engagement through utilitarian, hedonic, and social motives (Tian & Lu, 2022).

Thus, we hypothesize that:

Hypothesis 4: CIN is positively related to CE-CSBCC.

Hypothesis 5: CIN is positively related to CE-CABCC.

With the increasing attention paid to online brand communities as informal organization for customer brand interaction, some scholars proposed the concept of online brand community climate and divided it into supportive and controlled climate (Cao & Zhou, 2021; Zhang, Zhou, & Zhan, 2021). We focus on supportive community climate (SCC) and define it as the customers' perceived community characteristics of members supporting, helping, and trusting each other. Grisseemann and Stokburger-Sauer (2012) confirmed that company support to co-create positively influences degree of co-creation and Tajvidi et al.(2021) found social support enhances consumers' intention to co-create brand value.

Accordingly, we propose the following hypotheses:

Hypothesis 6: SCC is positively related to CE-CSBCC.

Hypothesis 7: SCC is positively related to CE-CABCC.

Additionally, individuals exhibit a higher level of creativity when colleagues are helping, supporting, and trusting each other (Zhou, 2003; Zhu, Gardner & Chen, 2018). This also explains that supportive climate in organizations can increase community members' willingness to try new things and to behave more innovatively (Rogiest & Segers, 2015). Combined with our previous deduction that CIN positively affects both CE-CSBCC and CE-CABCC, we hypothesize:

Hypothesis 8: SCC is positively related to CIN.

Hypothesis 9: CIN mediates the effect of SCC on CE-CSBCC.

Hypothesis 10: CIN mediates the effect of SCC on CE-CABCC.

3. Research Methods and Results

Using the online survey platform “Wenjuanxing” (www.wjx.cn), we administered a questionnaire survey to the registered members of *Xiaomi* brand community, and finally got 505 valid samples. Five core variables were measured in this study, and all items were taken and modified from existing literature. All constructs were measured using a seven-point Likert scale. Additionally, we considered gender, age, education, income, and years of community membership as control variables.

The data of this study had good reliability and validity. The fit indices for our measurement model were $\chi^2=183.447$, $df=94$, $p<0.001$, $\chi^2/df=1.952$, $NFI=0.970$, $CFI=0.985$, $TLI=0.981$, $IFI=0.985$, $RMSEA=0.043$, $SRMR=0.039$. All variables' Cronbach's alpha values were greater than 0.8. Their values of composite reliability (CR) fell between 0.805 and 0.926, exceeding the recommended value of 0.700. The factor loadings for all items were greater than 0.5. Beside these, the average variance

extracted (AVE) of each construct exceeded the recommended value of 0.5. Except for the slightly higher correlation between CE-CSBCC and CE-ASBCC, the square root of other AVE values were greater than the correlations between constructs.

We applied the structural equation modeling to test the theoretical model with a maximum likelihood estimation technique. The assessment of the structural model were $\chi^2=205.001$, $df=96$, $p<0.001$, $\chi^2/df=2.135$, $NFI=0.967$, $CFI=0.982$, $TLI=0.977$, $IFI=0.982$, $RMSEA=0.047$, $SRMR=0.042$, indicating that the model achieved an acceptable fit. The path analysis results were as follows. CE-CSBCC showed no significant positive effects on BLY ($\beta=-0.369$, $t=-1.117$, $p>0.1$), while CE-CABCC revealed significant positive effects on BLY ($\beta=0.779$, $t=1.962$, $p<0.05$), leading to the refuse of H1 and the support for H2. And CE-CSBCC demonstrated significant positive effect on CE-CABCC ($\beta=0.784$, $t=16.466$, $p<0.001$), supporting H3. Additionally, CIN established significant positive effects on both CE-CSBCC ($\beta=0.385$, $t=6.508$, $p<0.001$) and CE-CABCC ($\beta=0.156$, $t=3.883$, $p<0.001$), thus, H4 and H5 were supported. Similarly, SCC had significant positive effects on CE-CSBCC ($\beta=0.497$, $t=8.152$, $p<0.001$), CE-CABCC ($\beta=0.091$, $t=2.058$, $p<0.05$) and CIN ($\beta=0.697$, $t=11.506$, $p<0.001$), supporting H6, H7 and H8. We further conducted a mediation effect test using Model 4 in PROCESS. The results showed that CIN significantly mediated both the effects of SCC on CE-CSBCC (95%CI[0.227, 0.409]) and that of SCC on CE-CABCC (95%CI[0.256, 0.432]), supporting H9 and H10.

4. Discussion

The findings of this study offer several practical implications. First, a shift in the perception of brand management is required. In the past, brands were created and dominated by companies. Nowadays, brands are co-created by both the company and its customers. Consequently, brand companies should re-plan their brand development and management processes, enhancing customer engagement in brand building. Second, operate and manage online brand communities from the perspective of value co-creation and service-dominant logic, so as to facilitate CE-BCC on the platform. Third, incentive measures should be adopted to encourage CE-CABCC, thus enhancing customer brand loyalty. Fourth, guide customers to actively engage in a variety of brand co-creation activities by fostering supportive

community climate. Fifth, leverage the exemplary and word-of-mouth influence of highly innovative customers to promote brand co-creation.

This study extends the research in CE-BCC from focusing on its positive outcomes to examining whether different types of CE-BCC will lead to different outcomes, thus enabling a more granular depiction of the impact of customer engagement on brand loyalty. In addition, it provides a novel yet robust theoretical perspective on how SCC and CIN lead to BLY through CE-BCC, based on the comprehensive influence of individuals and the environment.

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MS0142: Data Capital, Export Upgrade and the Global Heterogeneity Knowledge Spillover Effect

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Data Capital, Export Upgrade and Global Heterogeneity of Knowledge Spillover Effect

Abstract

In the Industry 4.0 era, data capital has become a new production factor and a driving force for technological innovation. Using panel data from 31 provinces in mainland China from 2012 to 2019, this paper constructs a method for estimating the value of data capital (consists of raw data and structured data) in each region and verifies the positive role of data in enhancing regional export technological sophistication (ETS). Additionally, this paper explores the innovation mechanism through which data enhances ETS and analyzes the interaction between data and various other production factors in different types of innovation. For example, data replaces low-skilled labor in incremental innovation while complementing high-skilled labor in disruptive innovation. Finally, through a heterogeneous analysis of exports to different types of regions worldwide, we investigate how these diverse export behaviors, influenced by different knowledge spillover effects, play varying moderating roles in the impact of data on enhancing ETS. Specifically, exporting to regions with higher knowledge or technological compatibility will enhance the role of data capital in improving ETS, better leveraging the new data-based resource advantage.

Keywords: Exports; Innovation and R&D; Knowledge and Productivity Spillovers; Data Capital

1 Introduction

In the Industry 4.0 era, new digital technologies are continually emerging. As the digitalization and intelligentization of different parts of the supply chain deepen (Hofmann et al., 2019), the driving forces behind product innovation models are also changing (Ciarli et al., 2021; Veldkamp & Chung, 2024). This shift is profoundly affecting regional export behavior (Meyer et al., 2023). With the intensifying global challenges of geopolitics, climate change, protectionism, and unilateralism, the international trade system and global industrial chains are severely impacted. Consequently, global trade volumes have significantly contracted due to geopolitical tensions (Barbieri, 2024). To overcome difficulties in the new trade landscape, export products must leverage the digital revolution of Industry 4.0 to promote new innovation processes and enhance technological competitiveness.

Amid the waves of digitalization in Industry 4.0, data capital has emerged as a new production factor, becoming a novel driving force in the innovation process. In our paper, the scope of data capital includes both raw data and structured data that has been cleaned, organized, and stored. This definition is primarily derived from descriptions of the ‘information value chain’ or ‘data value chain’ in existing research (Canada, 2019; Nguyen & Paczos, 2020; Reinsdorf & Ribarsky, 2019). Although there are slight differences in their specific definitions, the overall framework is very consistent. Generally, they can be divided into three stages: data collection, data storage, and data analysis. The basic idea behind the value of data capital is that it is ‘produced’ through a ‘production’ process. The data collection process converts real-world phenomena and facts into binary code, producing raw data. The data storage process involves cleaning the raw data and organizing it according to certain standards and rules, producing structured data. Data analysis, on the other hand, is a value-adding process beyond the data capital itself, where its value lies in the information and knowledge extracted from the data. This is precisely the key to enhancing the technological level of export products.

The enhancement of export technological sophistication (ETS) relies on knowledge-based innovation at every stage of the supply chain, and the impact of data capital on innovation at each stage is being increasingly deepened in the Industry 4.0 era. R&D is a process of creating and improving knowledge. Data capital can increase the rate of discovering new knowledge (Agrawal et al., 2018) and improve the quality of existing ideas and knowledge (Jones & Tonetti, 2020). As the ‘fuel’ for AI and machine learning, data can increase productivity through automation (Aghion et al., 2017) and data-driven

decision making (Brynjolfsson et al., 2011). In addition, data capital can help firms establish more complex and comprehensive user profiles, enabling them to supply innovatively customized commodities (Kubina et al., 2015).

As a new type of production factor, data capital has garnered significant attention due to its interaction with other factors, especially labor. The digitalization and intelligentization processes based on data capital have had two significant impacts on labor in ETS innovation. On one hand, the intelligence driven by data capital has achieved efficiency comparable to that of humans, thereby replacing a large number of traditional labor positions (Aghion et al., 2017; Frey & Osborne, 2017). Data capital will reduce labor input in incremental innovation consisting of routine cognitive tasks (Autor et al., 2003), generating a strong replacement effect (Acemoglu & Restrepo, 2018). On the other hand, there has been an increase in labor engaged in non-routine cognitive tasks (Autor et al., 2003), with growth in high-skilled occupations (Goos et al., 2009), driving the process of disruptive innovation. Acemoglu and Restrepo (2018) introduced the concept of the labor reinstatement effect, which refers to the creation of entirely new positions, such as data scientists. This concept highlights how data capital increases the demand for high-skilled labor as well.

Additionally, in the export process, realizing the new data-based resource advantage must emphasize the knowledge spillover effect and consider the economic development compatibility with the target export region. In the process of exporting products, the exporting region is not merely sending out the products themselves; the knowledge generated through product R&D can spill over to other regions through trade (Falvey et al., 2004). In other words, the value added by data to exported products is a crucial source of knowledge spillover. A higher knowledge spillover effect can improve the cost and quality of the recipient's products, which in turn promotes imports and brings indirect benefits and incentives to the supplier (Harhoff, 1996). However, the actual effect of knowledge spillover will vary across different target export regions (Perri & Peruffo, 2016). This heterogeneity arises from the absorptive capacity of the host country's enterprises (Eapen, 2012; Zhang et al., 2010), the existing knowledge base and technological capabilities of the host country (Liu et al., 2000; Meyer & Sinani, 2009; Wei & Liu, 2006), the technological gap between the importing and exporting countries (Buckley, 2007; Zhang et al., 2010), and the level of technological freedom the exporting country has in the importing country (Giroud et al., 2012; Jindra et al., 2009). Therefore, multinational enterprises need to formulate targeted regional strategies to better leverage their new data-based resource advantages.

We used panel data from 31 provinces in mainland China from 2012 to 2019 to explore the role of data capital in enhancing the technological sophistication of export products, distinguishing between different types of innovation in the process. On this basis, we also studied the interaction between data capital and other factors. Specifically, investment in data capital can reduce some R&D expenditures. In incremental innovation, data capital can replace low-skilled labor due to its ease of replication. In disruptive innovation, data capital and high-skilled labor can form a complementary relationship, with data scientists processing and extracting the knowledge and information behind the data. Finally, we verified the heterogeneity in the impact of data capital on export technological sophistication (ETS) when exporting to different types of regions. Specifically, when China exports to regions in Asia, Africa, and Latin America, where there is better technological compatibility and a lower local knowledge base, the knowledge spillover effect is more effectively realized, enhancing the role of data in improving ETS. Conversely, when China exports to developed Western regions such as North America and Western Europe, the advanced local technology and knowledge levels hinder the knowledge spillover effect, thereby weakening the impact of data on enhancing ETS.

In summary, our work makes three main contributions. First, we verified the role of data capital—an important new production factor in the Industry 4.0 era—in enhancing the technological sophistication of export products. Second, this paper focuses on the innovation mechanism through which data improves export technological sophistication (ETS), providing empirical evidence for the different interactions between data capital and labor in various types of innovation processes. Third, this paper enriches the theory of knowledge spillover in the field of international business, offering empirical references for MNEs export strategies from the new data-based resource perspective.

The arrangement of the following article is as follows: Chapter 2 introduces the theoretical model and framework for the impact of data capital on export technological complexity; Chapter 3 presents the methods for estimating the value of data capital; Chapter 4 outlines the design and specific application methods of the empirical study; Chapter 5 reports the results of the empirical study; and Chapter 6 is conclusion.

2 Theoretical Foundation

2.1 Data Capital and ETS

To theoretically illustrate the potential of digital capital in enhancing export technological sophistication, we primarily rely on the model of [Hausmann et al. \(2007\)](#). In the basic model setup, there are two sectors producing export products. The traditional sector produces a single homogeneous good, while the innovative sector can produce a variety of goods. In our research, we focus more on the innovative sector. The innovative sector invests labor in product production projects. Initially, it needs to invest b units of labor to produce a product with a productivity level of θ , where θ is uniformly distributed between 0 and h . h represents the upper limit of a region's knowledge or technological level. In the digital economy era, this is no longer determined solely by human capital. Data can significantly enhance the level of knowledge and innovative ideas in the R&D process ([Jones & Tonetti, 2020](#)). [Cong et al. \(2021\)](#) also pointed out that data can be used in product sector R&D and knowledge accumulation, effectively improving innovation capabilities and thereby promoting long-term economic growth. Therefore, investment in data capital is a positive shock for the exogenous parameter h , expanding the region's knowledge frontier.

Afterward, investors observe the actual realized θ , which becomes common knowledge for all investors. At this point, there are two options. The first is to become an 'Incumbent,' producing the product they invested in. The second option, if the productivity of their own invested product is unsatisfactory, is to become an 'Imitator,' imitating the products of other investors. However, the imitated productivity will be discounted, reaching only $\alpha\theta$ ($0 < \alpha < 1$). α reflects the efficiency of imitating other investors to some extent. [Acquisti et al. \(2016\)](#) noted that an important characteristic of data is its ability to be easily stored, copied, and transmitted. This ease of replication facilitates more straightforward and accurate imitation. Therefore, investment in data capital positively impacts α , enhancing the efficiency of imitation.

Suppose θ_{max} is the productivity of the most productive good in the current market. The investor's decision can then be expressed as follows:

$$\left\{ \begin{array}{l} \theta_i \geq \alpha\theta_{max} \quad , \text{ stick with own project} \\ \theta_i < \alpha\theta_{max} \quad , \text{ emulate the } \theta_{max}\text{-project} \end{array} \right.$$

Based on the distribution of θ and assuming there are m investors, we can derive the cumulative distribution function and the probability density function of Θ_{max} (for detailed derivation, see the appendix), and thus obtain the expected value of productivity θ_{max} and revenue π :

$$E(\theta_{max}) = \frac{mh}{m+1} \quad (1)$$

$$\begin{aligned} E(\pi) &= \frac{ph}{2} \left[1 + \left(\frac{\alpha m}{m+1} \right)^2 \right] \\ &= \frac{ph}{2} \left[1 + \left(\frac{\alpha}{h} \right)^2 \cdot E(\theta_{max})^2 \right] \end{aligned} \quad (2)$$

The results clearly show that the expected return, as well as the expected value of θ , is driven by the expected value of θ_{max} . Therefore, in the empirical section, we will construct a proxy variable for θ_{max} . After determining the expected revenue, we assume that ρ is the interest rate and that the expected revenue remains stable over different periods. The present value of the expected revenue is then:

$$\int_0^{\infty} E(\pi)e^{-\rho t} dt = \left(-\frac{1}{\rho} E(\pi)e^{-\rho t} \right)_0^{\infty} = \frac{E(\pi)}{\rho} \quad (3)$$

Assuming the wage rate is w , $g(\cdot)$ is the labor demand function of the traditional sector ($g'(\cdot) < 0$), and L is the total labor supply. Based on this, we can construct the equilibrium condition according to the non-profit condition and the labor market clearing condition:

$$\begin{cases} \frac{ph}{2\rho} \left[1 + \left(\frac{\alpha m^*}{m^*+1} \right)^2 \right] = bw^* \\ m^*b + g(w^*) = L \end{cases} \quad (4)$$

Insert Figure 1 about here

As shown in Figure 1, when α or h increases, the non-profit line (blue) will rise, leading to a higher equilibrium point m^* . In other words, an increase in α or h will attract more investors. Recall that $E(\theta_{max})$ is $\frac{mh}{m+1}$. As mentioned earlier, data capital is a positive shock for both α and h . An increase in h can directly raise $E(\theta_{max})$, while an increase in α can also elevate $E(\theta_{max})$ by increasing m . Therefore, we propose that:

Hypothesis 1 An increase in data capital will enhance the technological sophistication of a region's export products.

Hypothesis 2 Data capital ultimately enhances export technological sophistication (ETS) by promoting the innovation process.

2.2 The Interaction Between Data Capital and Labor

In the Industry 4.0 era, data capital has emerged as a new production factor. Discussions surrounding data capital and its impact on the labor market, driven by intelligent and automated processes such as artificial intelligence and machine learning, are becoming increasingly prominent. [Aghion et al. \(2017\)](#) pointed out that the combination of data and artificial intelligence can produce capabilities and efficiencies close to or surpassing those of humans, with the advantage of low marginal costs. This inevitably leads to the replacement of a large number of traditional labor positions. In specific terms, [Frey and Osborne \(2017\)](#) assessed the likelihood of 702 detailed occupations being automated and found that approximately 47% of all jobs in the United States may be automated in the next 10-20 years. [Acemoglu and Restrepo \(2018\)](#) refers to the impact of data capital and artificial intelligence on the labor market as the replacement effect.

On the other hand, the impact of data capital on labor is not solely one of replacement. [Autor et al. \(2003\)](#), through an analysis of census data from 1960 to 1998, found that, regardless of industry, occupation, or educational level, automation and intelligitization reduced labor input in routine cognitive tasks but increased labor input in non-routine cognitive tasks. [Goos et al. \(2009\)](#) confirmed this conclusion, noting that routine office clerical jobs (relatively mechanical cognitive work) are largely being replaced by intelligent systems, while employment in high-skilled (professional or managerial) occupations tends to increase. Additionally, [Acemoglu and Restrepo \(2018\)](#) proposed the reinstatement effect mechanism, which creates entirely new positions. For example, the demand for data mining driven by data capital will lead to an increase in roles such as data scientists.

The interactions between data capital and labor depend primarily on the characteristics of tasks and the functions of labor in various types of innovation processes. This distinction is particularly evident in incremental innovation and disruptive innovation. As established in [Acemoglu et al. \(2022\)](#)'s model, low-type firms always engage in incremental innovations, while high-type firms may attempt radical

innovations. [Herrmann and Peine \(2011\)](#) categorized firms' innovation strategies into Radical Product Innovation (RPI), Incremental Product Innovation (IPI), and Product Imitation (PI). RPI requires the heterogeneous knowledge of scientists, IPI only requires the homogeneous knowledge or skills of individual employees, and PI does not require scientific knowledge at all, thus eliminating the need for employee education and skill training. The reasons for these differing requirements are intuitively easy to understand. RPI requires significant intellectual effort and highly creative minds ([Lundvall et al., 1992](#)), which are characteristics of high-skilled labor. IPI requires only the mechanical repetition of singular knowledge, without the need for creative knowledge or the ability to creatively combine existing knowledge. PI does not require the use of specialized knowledge or skills at all. These characteristics align with those of low-skilled labor.

Additionally, the characteristics of data capital, along with the processes through which it achieves value addition, ultimately determine its interaction with labor in the innovation process of enhancing export technological sophistication (ETS). Since data can be easily copied, transmitted, and stored ([Acquisti et al., 2016](#)), data capital can readily carry and transfer basic or elementary information and knowledge. Therefore, in incremental innovation or product imitation, where only singular knowledge is used or there is even no need to master specific knowledge, low-skilled labor will be partially replaced by data capital. In contrast, in disruptive or radical innovation, the potential knowledge within data capital requires technologies such as data analysis to be extracted. These innovative information analysis and knowledge extraction techniques are typically possessed by high-skilled labor. For example, disruptive innovation involves discovering useful innovative combinations from countless existing pieces of knowledge. Data capital can significantly improve the efficiency of this process ([Agrawal et al., 2018](#)). However, directing resource allocation and evaluating the value of discoveries require thorough integration with high-skilled experts.

Insert Figure 2 about here

Hypothesis 3 Due to its ease of replication, data can replace low-skilled labor that is primarily engaged in incremental innovation or production imitation.

Hypothesis 4 The deeper information and knowledge within data require data scientists for analysis

and extraction. Thus, data capital complements high-skilled labor engaged in disruptive innovation.

For a diagram of the related conceptual framework, please see Figure 2.

2.3 Data Capital and Knowledge Spillover

Next, we distinguished the impact of exporting to different types of regions on the role of data capital in enhancing export technological sophistication (ETS) by using the proportion of exports to various regions relative to total exports. This analysis contributes to international business theory.

One of the significant theoretical contributions of our study is to the theory of knowledge spillover.

Although our research is based at the regional level, [Audretsch and Lehmann \(2005\)](#) has demonstrated substantial evidence suggesting that the Knowledge Spillover Theory of Entrepreneurship also applies to regions.

In the Industry 4.0 era, export products inevitably include the added value of information and knowledge derived from data. Exporting involves not only the product itself but also the knowledge embedded within it ([Falvey et al., 2004](#)). Thus, the export process also facilitates knowledge spillover. And the knowledge spillover effect from exports can, in turn, provide innovation incentives and bring indirect benefits to the supplying country ([Harhoff, 1996](#)). A key aspect of the knowledge spillover effect is the absorptive capacity of the importing entity ([Eapen, 2012; Zhang et al., 2010](#)). And an important factor determining absorptive capacity is technological compatibility. In an empirical study on China, [Buckley \(2007\)](#) found that capital from Hong Kong, Macau, and Taiwan exerts spillover effects in low-skilled industries, while capital from Western developed countries, such as the United States and the European Union, brings significant spillover effects in high-skilled industries. A moderate technological gap is more conducive to realizing the knowledge spillover effect ([Zhang et al., 2010](#)).

[Meyer and Sinani \(2009\)](#) found that in low-income economies, incoming capital or knowledge can effectively spill over through the demonstration effect. In high-income economies, while high human capital and excellent institutional frameworks facilitate absorptive capacity, the knowledge spillover effect is closely related to the level or stock of the existing knowledge pool in the local area. ([Wei & Liu, 2006](#)). When the knowledge and technology level of the importing country far exceeds that of the exporting country, the knowledge accompanying the product may have insufficient usable value or too

low a marginal contribution, which is detrimental to knowledge spillover. In summary, the extent to which importing country benefit from the introduction of “value-added knowledge from data” depends largely on their own technological or knowledge capabilities(Liu et al., 2000).

Specifically, when China exports products to regions in Asia, Africa, and Latin America, the high degree of technological compatibility and relatively moderate positive development gap allow these regions to effectively absorb the knowledge spillovers from data value-added. This results in higher marginal returns and significantly strengthens the local knowledge pool, thereby enhancing the role of data capital in boosting export technological sophistication (ETS). Conversely, when China exports to Western developed regions such as Western Europe and North America, the relatively lower technological level of China and the advanced local knowledge pool hinder the knowledge spillovers from data value-added, weakening the impact of data capital on enhancing ETS.

Insert Figure 3 about here

Hypothesis 5 Exporting to regions with similar levels of technological compatibility and lower local knowledge pool levels will facilitate the knowledge spillover effect and enhance the role of data capital in improving ETS.

Hypothesis 6 Exporting to regions with significantly higher technological levels than the exporting country and a very advanced local knowledge pool will hinder the knowledge spillover effect and weaken the role of data capital in enhancing ETS.

For a diagram of the related conceptual framework, please see Figure 3.

3 The Measure of Data Capital

3.1 Information Value Chain and Data Related Process

Insert Figure 4 about here

When estimating the value of data capital, it is essential to consider the entire economic process from data generation to collection and eventual application. [Canada \(2019\)](#) defines the process of data participating in social production activities as the information value chain (As shown in Figure 4). The economic activities related to data capital on this chain include observing objective behaviors, digitizing these observations into data, structuring and storing data in databases, and extracting knowledge from databases using innovative techniques and research in data science. Except for observations unrelated to the production process, the remaining stages align with the general processes of data collection, data processing, and data analysis in knowledge production. According to this understanding, the economic activities involved from the data stage to the data science stage are all related to the economic value of data capital.

[Abis and Veldkamp \(2024\)](#) established a two-stage knowledge production model that intuitively depicts the economic activities of data throughout the information value chain. First, data managers transform raw data into usable structured data through processes of cleaning, structuring, and storage. Subsequently, data analysts and artificial intelligence analyze the processed data to produce the knowledge necessary for growth.

[Mawer \(2015\)](#) divided the entire knowledge production process into a more detailed data transformation chain, encompassing data input, processing, integration, and analysis. This process subsequently generates actionable knowledge insights that guide enterprise decisions and actions, ultimately translating into potential value.

[Reinsdorf and Ribarsky \(2019\)](#) proposed the data science lifecycle theory, emphasizing the process that begins with data acquisition and terminates in data visualization. [Nguyen and Paczos \(2020\)](#) described a similar value generation process when defining the global data value chain for cross-border data flows.

Therefore, in our work, we strive to identify and estimate the investment value of ‘data’ within the related value chain (which we also refer to as data capital), while not focusing on ‘observed facts’ unrelated to the production process or the added value of information and knowledge generated during the data science process.

3.2 Methods for Estimating Data Capital

According to existing research, the estimation of data scale is still in its early stages. [Canada \(2019\)](#) utilized the cost approach to value data-related assets. This method measures the direct labor cost by considering the wages and salaries of employees involved in the production of these assets.

Additionally, 50% of this compensation is allocated to account for indirect labor costs and other associated expenses. To represent the value of capital services, a 3% mark up is added. The sum of these three components provides an estimate of the total value of data-related assets. [Abis and Veldkamp \(2024\)](#) include the transformation of raw data into structured data, a process that requires relevant labor in their knowledge production model. Data managers create structured datasets, which, together with other technical analysts, serve as input factors in the knowledge production process. By solving the model equilibrium, they suggest that a firm's data stock can be calculated using the exponent parameters in the knowledge production function, as well as the number and wages of various types of labor employed. [Tambe et al. \(2020\)](#) propose that a firm's digital capital is a production factor that can be generated and utilized only after investment, and that ICT labor wages are more closely related to firm-level digital capital investment compared to hardware expenditures on ICT. For practical estimation of digital capital, they use resume data from LinkedIn to track the employment of ICT workers by firms, combining this with traditional firm-level financial data to construct an extended firm panel database on ICT labor investment. Then they estimate the price and quantity of digital capital from the time series of changes in its value.

Combining existing methods, we estimated the value of data capital in various regions using the wages of labor across different industries in China. The basic premise is that data is 'produced' by relevant workers, whether through converting objective facts into raw data or through structuring, storing, and processing it. The specific calculation formula is as follows:

$$D_{it} = \sum_j \alpha_j \cdot W_{ijt} \quad (5)$$

In this context, D_{it} represents the value of data capital for province i in year t , while W_{ijt} denotes the total wage of employees in industry j in region i in year t . Given that the importance and demand for data vary across industries, it is essential to construct a weighting proportion α_j to reflect the level of investment in data production for industry j .

The determination of α_j is crucial in our method. In any industry, data production work typically constitutes only a part of any given labor category's job; it is unlikely that any type of labor dedicates all their working time to data production. [Nguyen and Paczos \(2020\)](#) highlighted the necessity of assigning a data usage intensity indicator to the outputs of various sectors and industries when tracking the value of data from input-output tables. This indicator describes the proportion of data in productive inputs. [Canada \(2019\)](#) assumed a range of work time proportions dedicated to the production of data-related assets for each occupation, based on their national occupational classification standards. For example, it was assumed that financial investment analysts spend 10% to 20% of their work time producing data, so 10% to 20% of their total labor costs are allocated to data production. The issue with this approach is that assigning the proportion of work time for data production relies entirely on subjective judgment, lacking a convincing benchmark. [Tambe et al. \(2020\)](#) also used the conditional association with a firm's ICT investment as the sole criterion for distinguishing digital intangible assets from other intangible assets. Based on the above analysis, we attempt to establish a quantitative relationship between ICT investment and data production investment.

Specifically, we use the input-output tables compiled by the National Bureau of Statistics of China to calculate the proportion of ICT intermediate inputs to total intermediate inputs for each industry, which serves as α_j for each industry and is used to construct the data scale for the baseline regression (Specific results can be found in [Table 1](#) and [Table 2](#)). Additionally, we classify major industries into data-intensive, knowledge/technology-intensive, capital-intensive, and labor-intensive categories, assigning weights of 0.3-0.5, 0.2-0.3, 0.1-0.2, and 0-0.1 respectively to calculate the upper and lower bounds of data capital for each industry for robustness checks. We also calculated the scale of data capital using the three-part summation method of Statistics Canada, which is similarly used for robustness checks.

4 Methods

4.1 Data

Our variable construction primarily relies on public data from China and our own algorithms. The data covers 31 provinces in mainland China and spans the years 2012 to 2019. Export technological sophistication is constructed using general trade export data for different categories of goods (20 major categories in total) from Chinese customs for each province. Data capital is constructed based on our

algorithm for estimating its scale, with data mainly sourced from the China Labor Statistical Yearbook. The data required for constructing various control variables is obtained from the National Bureau of Statistics of China, the National Statistical Bulletin on Investment in Science and Technology, the Wind database, and other sources.

4.2 Variables and Measurements

4.2.1 Dependent variable

According to (Hausmann et al., 2007), we construct an indicator of export technological sophistication as the empirical proxy for θ_{max} . First, we assign a value to each category of export good j to represent its productivity or technological sophistication:

$$PRODY_j = \sum_i \frac{\frac{x_{ij}}{X_i}}{\sum_i \frac{x_{ij}}{X_i}} \cdot Y_i \quad (6)$$

x_{ij} represents the export value of good j in province i , and X_i represents the total export value of province i . Therefore, $\frac{x_{ij}}{X_i}$ represents the comparative advantage of province i in good j . Then, we use the comparative advantage as a weight to average the real GDP per capita of all 31 provinces. For example, a good with low technology should have a low PRODY value. This weighted averaging method allows us to achieve our goal effectively. Typically, developing regions have comparative advantages in these goods but lower GDPs. Conversely, developed regions have higher GDPs but do not consider these goods as their comparative advantages, resulting in a smaller product value.

Subsequently, we can further weight the PRODY values to obtain the region-level export technological sophistication as follows:

$$ETS_i = \sum_j \frac{x_{ij}}{X_i} \cdot PRODY_j \quad (7)$$

4.2.2 Independent variables

The core question we aim to answer is whether data can enhance the technological level of regional export goods. Therefore, we use the calculation results of regional data capital from Section 3 as our primary explanatory variable. We then employ various estimation models to verify the effect of data on enhancing export technological sophistication.

4.2.3 Control variables

Human Capital. From our theoretical model, labor is the critical factor in the production and innovation process of export goods. The parameter h represents the level of skills or human capital in a specific region. Therefore, we use the average years of education of workers in a province to represent its level of human capital. Improved labor quality will strengthen innovation and enhance export sophistication.

Workers of Different Level. Furthermore, we estimated the number of workers with different academic qualifications based on the education distribution of workers. Based on this, we can discuss the interaction effect of data capital and various skill levels of labor. The specific categories are shown in Table 3.

Insert Table 3 about here

R&D Expenditure. Technological upgrading requires not only labor input but also substantial investment in supporting resources. R&D expenditure represents a crucial investment in a region's innovation process, with an uncertain impact on export sophistication. If R&D resources are effectively utilized for independent research and development, they will enhance sophistication. However, if they are mainly directed towards imitative innovation, it may result in resource misallocation and efficiency loss, thereby inhibiting the growth of sophistication.

Capability of Innovation. From the theoretical model presented earlier, it is evident that the innovation process directly influences a region's export productivity or sophistication. In this context, we use the number of patents granted in a region to represent its innovation capability. Regions with stronger innovation capabilities will consequently exhibit higher export sophistication.

Openness. A region's openness to trade influences its ability to leverage foreign investment and advanced foreign technology to enhance the technological level of its own goods. We construct this variable using the ratio of each province's total import and export value to its GDP for the respective year.

Infrastructure of Transportation. International trade entails more risks and uncertainties compared to domestic trade, necessitating enterprises to respond promptly to changes in external market conditions. Advanced transportation infrastructure facilitates the timely and effective adjustment of production factors, thereby reducing adjustment costs. We represent a region's transportation infrastructure level by the total mileage of railway operations, inland waterways, and highways per 10,000 square kilometers in each province.

Prices. All else being equal, a region's goods price level will significantly impact the distribution of industrial development, the allocation of production resources, and investment and consumption intentions. These effects will, in turn, influence the technological research and development process of export products. We use the retail price index of goods in each province (with 2012 as the base year) as a proxy for this variable.

Economic Development. At the regional level, the dependent variables are often influenced by the region's economic development level, and our study is no exception. A region's economic development level is a significant potential factor affecting the technological content of its products. Therefore, we control for the region's real GDP per capita (2012 as the base year) to mitigate this influence.

4.3 Estimation Methods

In the basic regression model, we employ OLS and fixed effect panel data models to explore the influence of data capital on export technological sophistication. Specifically, we gradually add control variables to ensure the stability of the results. The regression model can be expressed as follows:

$$\ln ETS_{it} = \alpha + \beta_1 \cdot \ln D_{it} + \gamma' \mathbf{X}_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad (8)$$

ETS_{it} represents the export technological sophistication of province i in year t , and D_{it} represents the investment scale of data capital in province i in year t . \mathbf{X}_{it} is the vector of control variables. μ_i is the dummy variable for provinces to control for factors that vary among provinces but not over time. λ_t is the dummy variable for years to control for factors that vary over time but not among provinces. ϵ_{it} is the error term of the model.

Next, we replaced the primary explanatory variable D in the baseline regression with the upper and

lower limits of data scale previously estimated for each province, as well as the data scale estimated using the method from Statistics Canada. We then reran the fixed effects panel data model.

Third, we verify the mechanism of this effect. According to the theoretical model, a region's highest technological level (θ_{max}) and average technological level (θ) are determined by the parameters α and h , which are driven by different types of innovation. First, we remove the variable representing innovation from the baseline regression to observe changes in the coefficient of data capital. Second, we use different types of innovation as dependent variables to estimate the effect of data on innovation.

Then, we aim to explore the interaction effect between data capital and other production factors in the process of enhancing ETS. To do this, we included interaction terms of data capital in the fixed effect model. Specifically, we utilize different skilled workers as our labor factor variables. And R&D expenditure as other R&D related investments. The specific model is shown below:

$$\begin{aligned}
\ln ETS_{it} = & \alpha + \beta_1 \cdot \ln D_{it} + \beta_2 \cdot \ln LL_{it} + \beta_3 \cdot \ln D_{it} \cdot \ln LL_{it} \\
& + \beta_4 \cdot \ln ML_{it} + \beta_5 \cdot \ln D_{it} \cdot \ln ML_{it} \\
& + \beta_6 \cdot \ln HL_{it} + \beta_7 \cdot \ln D_{it} \cdot \ln HL_{it} \\
& + \beta_8 \cdot \ln RD_{it} + \beta_9 \cdot \ln D_{it} \cdot \ln RD_{it} \\
& + \gamma' \mathbf{X}_{it} + \mu_i + \lambda_t + \epsilon_{it}
\end{aligned} \tag{9}$$

Finally, we explore the moderating effect of exporting to different types of regions on the process of data enhancing export technological sophistication (ETS). First, we construct three proxy variables: the proportion of exports to Asia, Africa, and Latin America relative to the province's total exports (AS/AF/LA); the proportion of exports to North America relative to the province's total exports (NA); and the proportion of exports to Western Europe relative to the province's total exports (WEU). Then, we add interaction terms to the fixed effects panel data model and construct the following regression models:

$$\ln ETS_{it} = \alpha + \beta_1 \cdot \ln D_{it} + \beta_2 \cdot AS/AF/LA + \beta_3 \cdot \ln D_{it} \cdot AS/AF/LA + \gamma' \mathbf{X}_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad (10)$$

$$\ln ETS_{it} = \alpha + \beta_1 \cdot \ln D_{it} + \beta_2 \cdot NA + \beta_3 \cdot \ln D_{it} \cdot NA + \gamma' \mathbf{X}_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad (11)$$

$$\ln ETS_{it} = \alpha + \beta_1 \cdot \ln D_{it} + \beta_2 \cdot WEU + \beta_3 \cdot \ln D_{it} \cdot WEU + \gamma' \mathbf{X}_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad (12)$$

5 Results

5.1 Basic Regression and Robustness Test

In the basic regression, we examined the effect of data on export technological sophistication. The results are in Table 4.

Insert Table 4 about here

Columns (1) to (3) display the estimation results of the OLS model, while columns (4) to (6) present the results of the fixed effects panel data model. In each model, we gradually added control variables and two-way fixed effects. The positive effect of data capital on ETS remains significant throughout.

Insert Table 5 about here

Next, we replaced the primary explanatory variable in the baseline regression (using the FE model) with three data capital scales calculated using alternative methods. The positive effect of data on ETS remains robust. The results are presented in Table 5.

5.2 Mechanism Analysis

In this part, we remove the variable representing innovation capability from the baseline regression to compare the changes in the coefficient of data capital. The detailed results are shown in Table 6.

Insert Table 6 about here

As shown in Table 6, in the same regression model, the coefficient of data capital significantly increases after removing the innovation variable. This indicates that innovation is a crucial channel through which data influences ETS.

Next, we use different types of innovation as dependent variables to observe the varying effects of data capital. Invention patents primarily represent insight-driven innovation, utility patents represent knowledge-driven innovation, and appearance patents are largely achieved through imitative or incremental innovation. The results are shown in Table 7.

Insert Table 7 about here

The results in Table 7 are quite interesting. For insight-driven invention innovation, data may actually limit imagination and creativity, while highly educated talent is the key driving force for this type of innovation. For knowledge-driven utility innovation, data capital can play a significant role, potentially through data science. Similarly, data capital can also contribute to appearance innovation, by facilitating simple replication. From the coefficients of human capital, it is evident that this type of incremental or imitative innovation requires low-skilled labor to drive it.

5.3 Interaction Analysis

Based on the previous analysis, data may play different roles in various types of innovation processes. Consequently, it will interact differently with various production factors. The results based on model (9) are in Table 8.

Insert Table 8 about here

In incremental or imitation-based innovation, data, due to its ease of replication, can make this process more precise and accessible. As previously analyzed, low-skilled labor is the main group driving this type of innovation. Therefore, data capital can effectively substitute for this labor, a conclusion supported by the regression results in Table 8. Conversely, knowledge-driven innovation requires

significant support from data analysis. Thus, data capital needs to be fully integrated with high-skilled labor, leveraging their data science abilities to extract valuable information. The regression results in Table 8 show a complementary relationship between data and high-skilled labor.

Additionally, data capital, as a type of investment, can to some extent substitute for traditional R&D investment. As shown in Table 8, there is indeed a substitution relationship between data capital and R&D investment. In other words, data capital may be able to replace certain inefficient R&D investments.

5.4 Moderating Effects of Different Export Relationships

To explore the moderating effect of exporting to different types of regions on the impact of data in enhancing export technological sophistication (ETS), our model regression results are in Table 9.

Insert Table 9 about here

From the coefficients of the interaction terms, we can see that when China exports to regions in Asia, Africa, and Latin America, where there is good technological compatibility with China and a lower local knowledge pool, the positive effect of data on export technological sophistication (ETS) is further strengthened due to the full realization of the knowledge spillover effect. Conversely, when China exports to highly developed regions such as North America and Western Europe, the value-added knowledge embedded in the products is less useful to these regions, and the marginal returns are too low, hindering the knowledge spillover process. As a result, the role of data capital in enhancing ETS is ultimately weakened.

6 Discussion

Our results confirm the role of data capital in enhancing export technological sophistication (ETS). This provides a new data-based resource perspective for research on optimizing the technological sophistication of export products in the digitalization process of the Industry 4.0 era. Additionally, our findings on the interaction between data capital and labor provide empirical evidence for the ongoing discussions about the impact of artificial intelligence and automation on the labor force. Finally, within

the framework of the knowledge spillover theory, we identified the optimal regional export strategy under the data-based resource advantage, which involves exporting to regions with high knowledge or technological compatibility, rather than aggressively overestimating the role of data capital due to its cross-border advantages and attempting to export excessively to developed regions. This provides an empirical reference from a production factor perspective for the export strategies of MNCs in the Industry 4.0 era.

Currently, due to the limited availability of data, the empirical part of this research is based on regional-level panel data. In the future, as the statistical practices for corporate data assets become more standardized, related empirical research at the firm-level will provide new evidence and conclusions regarding the detailed performance of data capital.

7 Conclusion

In this paper, we explore the role of a new production factor in the Industry 4.0 era—data capital—in the technological upgrading of export products. Using panel data from 31 provinces in mainland China from 2012 to 2019, we constructed an estimation method for the scale of data capital by integrating existing research and empirically verified that increases in data capital enhance regional export technological sophistication (ETS). On this basis, we examined the mechanism through which data capital enhances ETS via innovation and explored the interaction of data with other production factors in different types of innovation. The empirical results indicate that data capital can partly save R&D-related expenditures and replace low-skilled labor primarily engaged in incremental innovation. In disruptive or radical innovation, data capital can complement high-skilled labor.

In addition, through a heterogeneous empirical analysis of exporting to different types of regions, we obtained valuable conclusions. As a developing country, when exporting to regions with good technological compatibility and a lower local knowledge base, the value-added knowledge embedded in the products will effectively spill over, thereby enhancing the role of data in improving ETS.

Conversely, when exporting to regions with high levels of economic and technological development and a sufficient and advanced existing knowledge base, the knowledge spillover effect will be hindered, ultimately weakening the impact of data on enhancing ETS.

Based on the findings of this article, we propose the following policy implications:

1. **Encourage Investment in Data Capital:** The government should encourage businesses and research institutions to increase their investment in data capital, particularly in innovation. This can be achieved through tax incentives and direct subsidies to enhance regional export technological sophistication (ETS).

2. **Improve Data Infrastructure:** To promote efficient data utilization, the government should invest in building big data centers and developing data-sharing platforms, ensuring smooth data flow across various industries and regions.

3. **Support Workforce Transition:** Given the substitutive relationship between data capital and low-skilled workers, the government should provide retraining and transition support to help this workforce adapt to the new technological environment and find new employment opportunities. Additionally, efforts should be increased to cultivate talent in data analysis, artificial intelligence, and related skills.

4. **Promote International Technological Cooperation:** The government should encourage businesses to engage in more technological cooperation and knowledge sharing with export markets that have good technological compatibility. Businesses should be encouraged to optimize product structures based on the market demands of these regions, increasing the technological content and knowledge value of their products to enhance competitiveness. Simultaneously, businesses should improve their independent innovation capabilities, develop core technologies and products with independent intellectual property rights, reduce reliance on external technologies, and increase competitiveness in high-tech markets.

5. **Facilitate Cross-Border Data Sharing:** While ensuring data privacy and compliance with cross-border data regulations, establish transnational data-sharing platforms to promote the cross-border flow and utilization of data, enhancing the role of data capital in driving technological innovation. Collaborate with regions with high levels of economic and technological development to advance data standardization and promote data interoperability, thereby improving data utilization efficiency.

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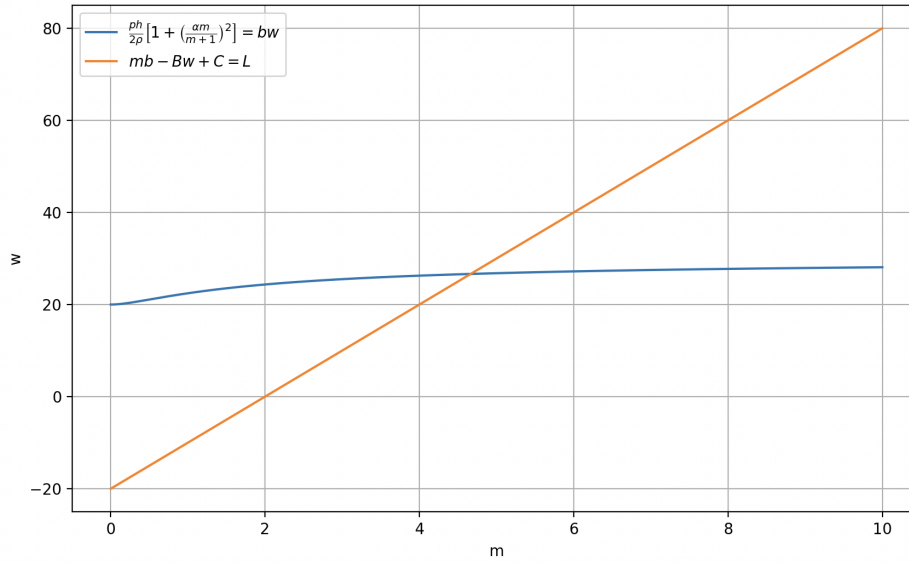


Figure 1: The Simulation of Equilibrium

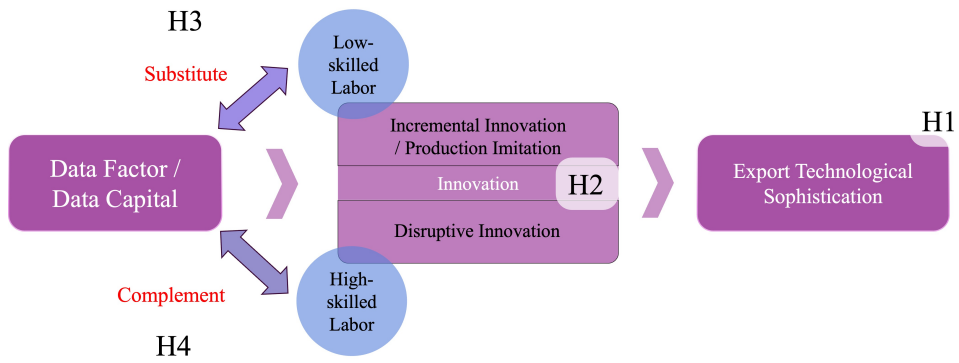


Figure 2: The Conceptual Framework of Data Capital and ETS

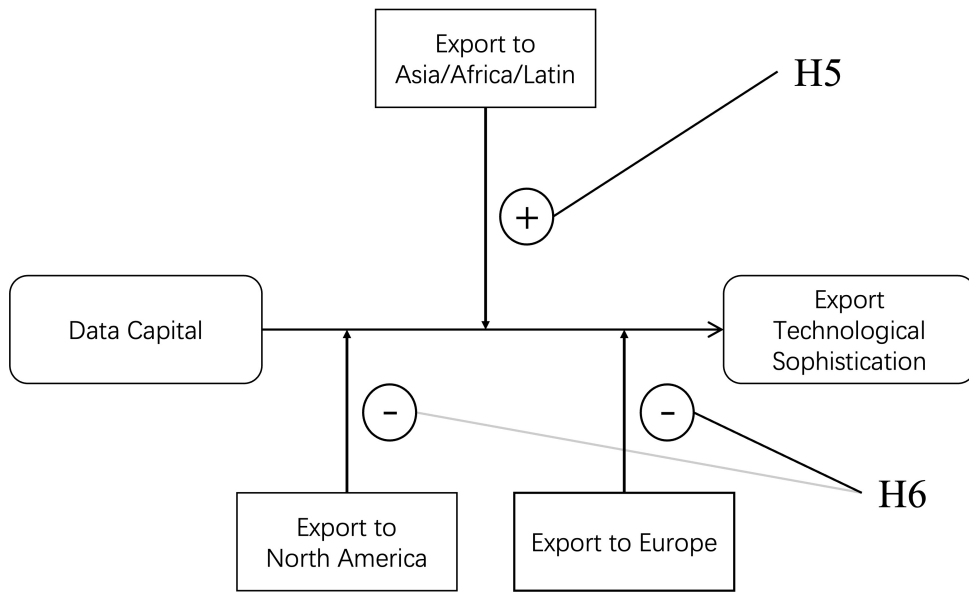


Figure 3: Moderating Effect of Different Institutional Factors on the Role of Data in Enhancing ETS



Figure 4: Information Value Chain of Statistics Canada (2019)

Table 1: Nationwide and Provincial Human Cost of Data Elements from 2012 to 2019 - Part 1 (2019 Prices, Billion Yuan)

	2012	2013	2014	2015	2016	2017	2018	2019
Nationwide	8239.8	11416.5	12695.9	14485.5	15775.8	16477.5	17390.8	18832.2
Guangdong	1110.7	1990.4	2289.0	2582.5	2846.2	2969.2	3185.6	3471.6
Beijing	930.9	1072.7	1198.1	1413.4	1550.9	1696.2	1911.6	2116.2
Jiangsu	662.7	1333.9	1451.8	1621.8	1677.0	1728.2	1739.1	1764.6
Shanghai	558.6	785.8	905.9	1010.0	1089.0	1138.9	1213.0	1413.4
Zhejiang	582.5	669.5	744.6	833.7	938.7	1015.3	1059.1	1187.2
Shandong	444.7	593.4	648.8	730.5	807.8	822.3	810.7	831.4
Sichuan	310.8	517.8	522.0	618.5	651.0	672.9	713.7	760.1
Henan	337.9	433.5	491.5	563.3	628.6	652.3	615.6	655.5
Fujian	290.7	335.5	359.3	409.1	448.3	476.5	521.7	543.0
Hubei	248.0	294.8	351.8	402.6	465.8	461.8	485.4	534.8
Hunan	240.9	280.5	306.1	330.5	365.6	389.1	406.5	456.5
Anhui	174.7	222.6	251.8	291.3	323.9	340.6	426.2	453.0
Hebei	229.1	272.3	302.9	359.4	394.6	358.4	380.4	417.4
Shaanxi	204.5	249.0	284.6	323.3	357.6	377.6	386.3	416.1
Liaoning	241.4	297.5	307.3	332.0	332.6	322.3	338.3	366.7

Table 2: Nationwide and Provincial Human Cost of Data Elements from 2012 to 2019 - Part 2 (2019 Prices, Billion Yuan)

	2012	2013	2014	2015	2016	2017	2018	2019
Jiangxi	131.8	189.5	215.1	256.9	284.1	299.1	316.6	358.6
Chongqing	163.7	205.8	243.6	283.0	311.1	321.5	342.7	350.5
Tianjin	228.0	258.6	281.8	309.0	303.3	307.9	301.9	328.6
Yunnan	127.9	160.7	170.7	203.2	245.3	277.4	298.6	306.7
Guangxi	128.7	164.5	176.9	217.5	236.5	251.0	265.9	290.6
Shanxi	146.4	180.5	195.1	219.8	230.7	245.2	250.0	264.3
Guizhou	104.7	130.5	150.6	183.3	216.5	231.2	238.8	253.2
Xinjiang	111.4	130.4	144.6	174.1	188.7	200.2	223.2	238.7
Heilongjiang	137.1	155.0	168.2	187.8	199.7	207.0	205.0	222.8
Inner Mongolia	109.8	135.0	142.1	155.2	166.0	172.7	184.4	207.3
Jilin	98.9	125.1	134.8	154.7	168.5	174.1	177.1	186.3
Gansu	75.1	100.4	113.7	135.9	153.3	161.4	165.4	182.3
Hainan	35.4	46.0	50.8	61.9	66.3	71.3	77.9	81.6
Tibet	17.9	24.7	26.7	46.3	45.8	48.3	52.8	64.9
Qinghai	27.4	29.6	32.3	36.4	40.8	44.6	50.2	57.6
Ningxia	27.4	30.8	33.5	38.4	41.4	43.0	46.8	50.9

Table 3: Skill Categories by Academic Qualifications

Academic Qualifications	Category 1	Category 2
Junior high school and below	Low-skilled workers	Low-skilled workers
high school	Medium-skilled workers	
University and above	High-skilled workers	High-skilled workers

Table 4: The Influence of Data on ETS

	OLS			FE Model of Panel Data		
	(1)	(2)	(3)	(4)	(5)	(6)
Data Capital	0.057*** (0.009)	0.155*** (0.024)	0.048*** (0.018)	0.565*** (0.030)	0.432*** (0.050)	0.048** (0.022)
Human Capital		0.348*** (0.102)	0.033 (0.055)		1.201*** (0.200)	0.033 (0.065)
R&D Expenditure		-0.089*** (0.017)	-0.032** (0.013)		0.058 (0.052)	-0.032** (0.014)
Innovation Capability			0.024*** (0.008)			0.024** (0.012)
Openness			0.078*** (0.025)			0.078*** (0.027)
Trans Infra			0.086* (0.044)			0.086 (0.071)
Prices			-0.571** (0.228)			-0.571** (0.227)
Real GDP per Capita			-0.062 (0.067)			-0.062 (0.096)
Constant	10.522*** (0.052)	9.658*** (0.212)	12.657*** (1.247)	7.726*** (0.167)	5.387*** (0.411)	12.717*** (1.351)
Province Fixed Effect	No	No	Yes	Yes	Yes	Yes
Year Fixed Effect	No	No	Yes	No	No	Yes
<i>N</i>	248	248	248	248	248	248
<i>R</i> ²	0.137	0.221	0.988	0.140	0.141	0.726

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Substituting Primary Explanatory Variable for Robustness Test

	(1)	(2)	(3)
D_{max}	0.061** (0.025)		
D_{min}		0.058** (0.027)	
D_{can}			0.048** (0.022)
Control Variables	Yes	Yes	Yes
Constant	12.858*** (1.361)	12.662*** (1.298)	12.696*** (1.346)
Province Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
N	248	248	248
R^2	0.702	0.723	0.726

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Mechanism Test - I

	(1)	(2)
	Basic Regression	Comparison
Data Capital	0.048*** (0.018)	0.050*** (0.018)
Innovation Capability	0.024*** (0.007)	
Constant	12.717*** (0.851)	12.114*** (0.855)
Control Variables	Yes	Yes
Province Fixed Effect	Yes	Yes
Year Fixed Effect	Yes	Yes
<i>N</i>	248	248
<i>R</i> ²	0.726	0.684

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Mechanism Test - II

	(1)	(2)	(3)	(4)
	Total Patents	Invention Patents	Utility Patents	Appearance Patents
Data Capital	0.336* (0.180)	-0.326** (0.145)	0.674*** (0.210)	0.518* (0.304)
Human Capital	-0.256 (0.634)	2.280*** (0.512)	0.338 (0.743)	-3.208*** (1.072)
R&D Expenditure	0.305*** (0.111)	0.481*** (0.089)	0.230* (0.130)	0.309* (0.187)
Constant	6.775*** (1.796)	1.598 (1.451)	3.515* (2.104)	11.055*** (3.037)
Province Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
<i>N</i>	248	248	248	248
<i>R</i> ²	0.908	0.741	0.895	0.832

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Interaction between Data and Other Factors

	(1)	(2)	(3)
	ETS	ETS	ETS
Data Capital	0.049 (0.092)	0.192*** (0.045)	0.161*** (0.044)
data * HC	0.017 (0.045)		
data * LL1		-0.030*** (0.011)	
data * LL2			-0.019** (0.009)
data * ML		0.017 (0.010)	
data * HL		0.019* (0.010)	0.025*** (0.009)
data * RD	-0.008** (0.004)	-0.023*** (0.007)	-0.018*** (0.007)
Constant	13.481*** (0.897)	12.266*** (0.907)	12.621*** (0.897)
Control Variables	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
<i>N</i>	248	248	248
<i>R</i> ²	0.827	0.784	0.768

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Moderating Effects of Different Export Relationships

	(1)	(2)	(3)
	ETS	ETS	ETS
Data Capital	-0.005 (0.022)	0.069*** (0.025)	0.069*** (0.022)
Data * AS/AF/LA	0.081*** (0.028)		
Data * North America		-0.119** (0.047)	
Data * West EU			-0.179*** (0.054)
Constant	12.283*** (1.140)	12.404*** (1.226)	11.393*** (1.067)
Control Variables	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
<i>N</i>	248	248	248
<i>R</i> ²	0.808	0.765	0.815

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

8 Appendix

A The Expected Value of the Maximum Productivity

Because θ is distributed uniformly, the pdf of Θ is:

$$f(\Theta = \theta) = \begin{cases} \frac{1}{h} & \text{if } 0 \leq \theta \leq h \\ 0 & \text{otherwise} \end{cases}$$

Suppose there are m investors, Then the cdf of Θ_{max} ($0 \leq \theta_{max} \leq h$) is:

$$\begin{aligned} F_{\Theta_{max}}(\theta_{max}) &= P(\Theta_{max} \leq \theta_{max}) \\ &= P(\Theta_1 \leq \theta_{max}, \Theta_2 \leq \theta_{max}, \dots, \Theta_m \leq \theta_{max}) \\ &= P(\Theta_1 \leq \theta_{max}) \cdot P(\Theta_2 \leq \theta_{max}) \cdot \dots \cdot P(\Theta_m \leq \theta_{max}) \\ &= \int_0^{\theta_{max}} \frac{1}{h} d\theta_1 \cdot \int_0^{\theta_{max}} \frac{1}{h} d\theta_2 \cdot \dots \cdot \int_0^{\theta_{max}} \frac{1}{h} d\theta_m \\ &= \left(\frac{\theta_{max}}{h}\right)^m \end{aligned}$$

In other words:

$$F_{\Theta_{max}}(\theta_{max}) = \begin{cases} 0 & \text{if } \theta_{max} < 0 \\ \left(\frac{\theta_{max}}{h}\right)^m & \text{if } 0 \leq \theta_{max} \leq h \\ 1 & \text{if } \theta_{max} > h \end{cases}$$

Then the pdf of Θ_{max} is

$$f(\theta_{max}) = (F_{\Theta_{max}}(\theta_{max}))' = \begin{cases} \frac{m \cdot (\theta_{max})^{m-1}}{h^m} & \text{if } 0 \leq \theta_{max} \leq h \\ 0 & \text{otherwise} \end{cases}$$

Then, we can get the expected value of θ_{max} :

$$\begin{aligned}
E(\theta_{max}) &= \int_0^h \theta_{max} \cdot \frac{m \cdot (\theta_{max})^{m-1}}{h^m} d\theta_{max} \\
&= \int_0^h \frac{m \cdot (\theta_{max})^m}{h^m} d\theta_{max} \\
&= \left(\frac{m}{h^m} \cdot \frac{1}{m+1} \cdot (\theta_{max})^{m+1} \right)_0^h \\
&= \frac{m \cdot h^{m+1}}{h^m \cdot (m+1)} \\
&= \frac{mh}{m+1}
\end{aligned}$$

B The Expected Value of Revenue

Based on the probability density functions of Θ and Θ_{max} , we can determine the expected probability of an investor choosing to become an imitator or an incumbent:

$$\begin{aligned}
Prob(Imitator) &= P(\theta_i < \alpha\theta_{max}) \\
&= \int_0^h \frac{m \cdot (\theta_{max})^{m-1}}{h^m} \cdot \int_0^{\alpha\theta_{max}} \frac{1}{h} d\theta d\theta_{max} \\
&= \int_0^h \frac{\alpha m \cdot (\theta_{max})^m}{h^{m+1}} d\theta_{max} \\
&= \left(\frac{\alpha m}{h^{m+1}} \cdot \frac{1}{m+1} (\theta_{max})^{m+1} \right)_0^h \\
&= \frac{\alpha m}{m+1}
\end{aligned}$$

$$Prob(Incumbent) = 1 - \frac{\alpha m}{m+1}$$

Besides, suppose the price of the product per unit of productivity is p , we can calculate the expected revenue conditional on whether the investor is an imitator or an incumbent:

$$\begin{aligned}
E(\pi|Imitator) &= E(p \cdot \alpha\theta_{max}) \\
&= \alpha p E(\theta_{max}) \\
&= \alpha p \cdot \frac{mh}{m+1}
\end{aligned}$$

$$\begin{aligned}
E(\pi|Incubent) &= E(p \cdot \theta_i | \theta_i \geq \alpha\theta_{max}) \\
&= p \cdot \frac{\alpha E(\theta_{max}) + h}{2} \\
&= \frac{ph}{2} + \frac{\alpha m p h}{2(m+1)} \\
&= \frac{ph}{2} \cdot \left(1 + \frac{\alpha m}{m+1}\right)
\end{aligned}$$

Combining the above results, we can obtain the overall expected revenue:

$$\begin{aligned}
E(\pi) &= E(\pi|Incumbent) \cdot Prob(Incubent) + E(\pi|Emulator) \cdot Prob(Emulator) \\
&= \frac{ph}{2} \cdot \left(1 + \frac{\alpha m}{m+1}\right) \cdot \left(1 - \frac{\alpha m}{m+1}\right) + \alpha p \cdot \frac{mh}{m+1} \cdot \frac{\alpha m}{m+1} \\
&= \frac{ph}{2} \cdot \left(1 - \left(\frac{\alpha m}{m+1}\right)^2\right) + ph \left(\frac{\alpha m}{m+1}\right)^2 \\
&= \frac{ph}{2} \left[1 - \left(\frac{\alpha m}{m+1}\right)^2 + 2\left(\frac{\alpha m}{m+1}\right)^2\right] \\
&= \frac{ph}{2} \left[1 + \left(\frac{\alpha m}{m+1}\right)^2\right] \\
&= \frac{ph}{2} \left[1 + \left(\frac{\alpha}{h}\right)^2 \cdot E(\theta_{max})^2\right]
\end{aligned}$$



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MS0144: Innovation in Product or Business Model for University-Based Firm's Capability to Survive? An Open Innovation Perspective

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**Innovation in Product or Business Model for University-Based Firm's Capability to Survive?
An Open Innovation Perspective**

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Abstract

This study examines the mediating role of innovation in the relation between social network and a firm's capability to survive, which further specifies innovation into product and business model innovation as competing mediators according to the discourses of open innovation. Based on a survey data from 111 university-based firm (UBF) in Indonesia, this study found business model innovation serve as a better mediator compared to product innovation. These findings denotes the important role of business model innovation as an intermediary mechanism which exert more comprehensive approach in translating external sources based on social network in generate capability to survive.

Keywords:

Product innovation, business model innovation, intermediary role, open innovation, university-based firm, Indonesia.

1. Introduction

As the general studies in innovation are either focusing on the elaboration of the drivers and barriers for innovation (Hudnurkar et al., 2023; Li and Huang, 2019; Subramaniam and Yound, 2005), or emphasize more on the outcomes or consequences of the innovation (Cefis and Marsili, 2006; Löfsten, 2016; Nemlioglu and Mallic, 2021), Simao et al. (2023) point out the importance to elaborate the intermediary role of innovation. Open innovation theory promotes the relevance of innovation as an intermediary mechanism (Wang et al., 2023), and introducing the strategic role of business model innovation (Chesbrough, 2003).

Although has been considered important, business model innovation still received limited attention (Tidd and Bessant, 2019), in particularly when discussed along with the product innovation. In fact, business model innovation is perceived to be the most suitable counterpart in discussing product innovation (Amit and Zott, 2012). In parallel, majority of prior studies are also abundantly focus more on the internal sources (e.g., human capital) as the underlying factor that shaping innovation processes and outcomes (O'Reilly and Tushman, 2021; Zhao et al., 2023). In this regard, Chesbrough (2003) with the open innovation paradigm basically emphasize the significance of external sources in generating innovation.

Moreover, the context of university-based firm (UBF) is also considered relevant (Wright et al., 2007). Despite the strategic role and rising importance of UBFs, Mustar et al. (2007) found that only 75 percent of the European UBFs survive six years after birth, rising the survival issue, especially in the context of developing country. Further, in the firm's survival discourses, some scholars also emphasize to focus on the firm's capability to survive instead of survival (Covin and Slevin, 1991; Teece et al., 1997). It is based on the idea that firm's survival offers only a snapshot of the challenges that the firms faced, while understanding the underlying capabilities that enable their survival provides deeper insights related to the survival process (Barney, 1991; Teece et al., 1997).

In sum, this study generally aim to examine the intermediary role of innovation in the relation between social network and capability to survive in the context of UBF in developing country. In this regard, the discourses based on the perspective of open innovation which point out the important role

of utilizing the firm's external resources in innovation endeavours. Specifically, based on the two types of innovation which are product and business model innovation.

2. Literature Review and Hypothesis Development

The perspective of open innovation theory employed to justify framework related to the intermediary role of innovation in the relation between social network and capability to survive. In particular, by comparing between product and business model innovation. Three basis hypotheses proposed. First, this theory also posits that the strength and reach of firm's social network can buffer against market uncertainties by providing timely information and early warnings about industry shifts or emerging technologies (Aldrich and Zimmer, 1986). This further enables firms to adapt their strategies proactively, thereby increasing their chances of survival. Second, Hsu et al. (2015) emphasize the importance of having access in order to utilize external knowledge in order to innovate. In the development of new and innovative product, sharing or exchanging tacit and explicit knowledge are vital, where social network act as the enabler of those flow of information and knowledge (Nahapiet and Ghosal, 1998). Third, business model innovation often requires collaboration with external parties (Chesbrough and Crowther, 2006). This is imply the crucial role of social network on forming strategic alliances and partnership that can provide complementary capabilities and enhance the value proposition of the new business model (Gulati, 1998). Accordingly:

Hypothesis 1: The level of UBF's social network is positively associated to its level of capability to survive.

Hypothesis 2a: The level of UBF's social network is positively associated to its level of product innovation.

Hypothesis 2b: The level of UBF's social network is positively associated to its level of business model innovation.

Furthermore, product innovation generally drives progress in the realm of tangible goods and services, fostering creativity, differentiation, and competitive advantage. It generate groundbreaking technologies, refines existing solutions, and fuels the race for excellence in the global marketplace that emphasize for novelty (Christensen, 1997). On the other hand, business model innovation challenges the very foundations of an organization's operational logic (Amit and Zott, 2012). It

redefines the rules of engagement, the pathways to profitability, and the orchestration of resources. This form of innovation enables organizations to remain agile, responsive, and attuned to the demands of a dynamic ecosystem. Thus, the next hypothesis proposed as follows:

Hypothesis 3a: The level of UBF's product innovation is positively associated to its level of capability to survive.

Hypothesis 3b: The level of UBF's business model innovation is positively associated to its level of capability to survive.

The current body of research has been suggested that the connection between organizational practices, capabilities, including environmental drivers are generally not direct in generating outcomes (López-Gamero et al., 2009; Wang et al., 2020). Innovation, on the other hand, perceived to be a fundamental driver for organizational outcomes by empowers firms to adapt in the evolving market demands, gain a competitive edge, and enhance capability to survive (Tushman and Anderson, 1986). Product and business model innovation are perceived to be an effective mechanism in translating resources collected by the firm based on its external sources into outcomes. Product innovation centers on transform those resources via creating novel or improved offerings to address specific customer needs or preferences (Tidd and Bessant, 2019), while business model innovation transform those resources by focuses on reconfiguring the fundamental aspects of how firm operates, captures value, and sustains its competitive advantage (Amit and Zott, 2012). Imply that:

Hypothesis 4a: The level of UBF's product innovation mediate the relation between its social network and capability to survive.

Hypothesis 4b: The level of UBF's business model innovation mediate the relation between its social network and capability to survive.

Lastly, this study argue that compared to product innovation, business model innovation can serve as better mediator in the relation between social network and capability to survive based on several basis: 1) holistic transformation of operations (Johnson et al., 2008); 2) flexibility and adaptivity Chesbrough (2010); 3) creation of sustainable competitive advantage (Teece, 2010); and 4) adaptability to market changes and risk mitigation (Zott et al., 2011). Accordingly, this study also argue that compared to product innovation, business model innovation serves as better mediator in the

relationship between UBF's social network and its capability to survive. Figure 1 provide the illustration of the proposed conceptual model of the study.

Hypothesis 4c: Compared to the level of UBF's product innovation, business model innovation is better in mediating the relation between its social network and capability to survive.

-- Insert Figure 1 about here --

3. Method

The data for this study was derived from an offline survey using questionnaire collected from 111 UBFs in Indonesia. Table 1 summarize the sample profiles of the collected data. Four main constructs are used: social network, product innovation, business model innovation, and capability to survive. These constructs were measured using a 5-point Likert scale. In addition to the main variables, there are also five control variables included in the model, which are firm's size, age, industry, income, and management. Table 2 summarizes the overview for each of the constructs. The data was analysed using the Partial Least Square Structural Equation Model (PLS-SEM).

-- Insert Table 1 about here --

-- Insert Table 2 about here --

4. Result

As a basis, Harman's single-factor test was employed, and reported that the unrotated factor analysis produced the first factor explaining less than 50 percent (47.70%) variance, imply that CMV was not a concerning issue (Harman, 1967; Podsakoff et al., 2003). Furthermore, the measurement model reported to be satisfying based on Table 3 criteria, where the convergent and discriminant validity as well as reliability result reported in Table 4 and 5.

-- Insert Table 4 about here --

-- Insert Table 5 about here --

Table 6 and Figure 2 show the results of the structural model examination. In general, the results demonstrate that social network positively affect all three endogenous latent constructs, which are capability to survive ($\beta=0.342$; $p<0.01$), product innovation ($\beta=0.449$; $p<0.01$), and business model innovation ($\beta=0.465$; $p<0.01$), denotes support for hypothesis 1 and 2a-2b. However, for hypothesis 3a-3b, only business model innovation demonstrate a positive effect on capability to survive

($\beta=0.242$; $p<0.05$), while product innovation is not reported to have the positive effect ($\beta=0.158$; $p>0.1$). Moreover, business model innovation demonstrate as a mediator in the social network-capability to survive relation ($\beta=0.113$; $p<0.05$), while product innovation unfortunately does not act as the mediator ($\beta=0.071$; $p>0.1$). Imply that only hypothesis 4b is supported while not for the case of hypothesis 4a. This is also indicates that the hypothesis 4c that denotes business model innovation as a better mediator compared to product innovation is also supported.

-- Insert Table 6 about here --

-- Insert Figure 2 about here --

Moreover, Table 7 provide the coefficient of determination (R^2). The structural model reveals a variance of 45.8 percent for capability to survive ($R^2=0.458$), which classified as moderate. Product innovation reported 23 percent of variance ($R^2=0.230$) and business model innovation report 24.4 percent of variance ($R^2=0.244$), indicate that both classified as weak. Table 8 provide the results of RMSE and MAE results along with the comparison to its LM benchmark, all indicators of the key constructs (i.e., product innovation, business model innovation, capability to survive) reported smaller value in both RMSE and MAE in PLS-SEM compared to the LM benchmark. Indicates that the PLS-SEM results suggest the model has high predictive power as it outperforms the naïve LM benchmark model's indicators.

-- Insert Table 7 about here --

-- Insert Table 8 about here --

5. Discussion

This study explores the intermediary role of product and business model innovation in the relationship between social networks and the capability to survive in UBFs in developing countries. Grounded in the open innovation theory (Chesbrough, 2003), the study emphasizes the importance of external sources for innovation over internal resources, highlighting how innovation serves as a strategic lever to transform external resources into outcomes, thereby enhancing a firm's capability to survive. The findings indicate a positive effect of UBS social networks on their capability to survive and on both product and business model innovation, underscoring the significance of external sources in generating for outcomes (Shi et al., 2020; Ju, 2023). However, while business model innovation

positively impacts the capability to survive, product innovation does not. In UBFs, product innovation may not immediately translate into capability to survive due to niche markets and emerging industries where market acceptance and competitive imitation pose significant risks (Gans and Stern, 2003). Conversely, business model innovation, involving rethinking how a firm creates, delivers, and captures value, offers immediate and tangible benefits by reconfiguring value propositions, revenue streams, and operational processes to enhance adaptability and resilience (Chesbrough, 2010; Chesbrough and Bogers, 2014).

Overall, the study evidences the intermediary role of innovation in the UBFs' social network-capability to survive relationship, with business model innovation playing a more critical role than product innovation due to the complex management processes involving academic and business entities and the need for a comprehensive approach to resource translation into capability to survive. This finding aligns with the open innovation paradigm and suggests that business model innovation optimizes the benefits derived from social networks, especially in the resource-constrained context of UBFs (Rasmussen et al., 2014).

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APPENDIX

1. List of Table

Table 1. Sample Profiles

Characteristic	Respondents (N=111)	Percentage (%)
Age		
▪ <5 years	56	50.5
▪ >5 years	55	49.5
Size		
▪ Big (≥ 100)	6	5.4
▪ Medium (20-99)	28	25.2
▪ Small (5-19)	46	41.4
▪ Micro (1-4)	31	28
Industry		
▪ Product	49	44.1
▪ Services	62	55.9
Nett Monthly Income (Million-IDR)		
▪ <50	71	64
▪ 50 – <100	19	17.1
▪ 100 – 150	7	6.3
▪ >150	14	12.6
Management		
▪ Fully independent	79	71.2
▪ Not fully independent	32	28.8

Source(s): output from the analysis results

Table 2. Constructs and Measurements

Variables	Operational Definition	Measurement
Product Innovation	Firm's capability in develop new product innovation (Lawson and Samson, 2001)	6 items adapted from Thakur and Hale (2013)*
Business Model Innovation	Firm's innovation which related to the approaches that the firm used in penetrate its market (Zott and Amit, 2008)	3 items adapted from Velu (2015)*
Social Network	The firm's resources in a relationship of interactions, networking, and collaborations with external parties (Bontis, 1998; Tsai, 2001)	3 items adapted from Shane and Cable (2002)*
Capability to Survive	The firm's perception to their ability, chance, and resiliency to survive in the middle of the competition (Naidoo, 2010)	4 items adapted from Naidoo (2010)*
Size	The total number of employees in the company	Number of employee
Age	The total years the company has operated	Years of establishment
Income	Firm's range income in a month (Million-IDR)	Average monthly income (Million-IDR)
Industry	The firm's industry	Products or services
Management	The UBF management in terms of its independency from the parent organization (university)	Fully independent or not

Source(s): various sources compiled

Table 3. Construct and Measurements Assessment's Indicators

Statistics	Reference Threshold
Factorial validity	≥ 0.7
Convergent validity	AVE ≥ 0.5
Discriminant validity	AVE $\geq R^2$
Composite reliability	CR ≥ 0.7
Cronbach's alpha	≥ 0.6

Source(s): Hair et al. (2019; 2022)

Table 4. Measurement Model: Construct Validity and Reliability

	Mean	SD	Range	Loading	CR	AVE	Corr ²
<i>Socnet</i>					0.725	0.642	0.297
Sn1	3.721	0.811	2-5	0.767			
Sn2	3.928	0.771	2-5	0.837			
Sn3	3.432	0.94	1-5	0.798			
<i>Pinnov</i>					0.934	0.751	0.349
Pi1	3.414	0.929	1-5	0.851			
Pi2	3.568	0.931	1-5	0.888			
Pi3	3.495	0.913	1-5	0.916			
Pi4	3.297	0.94	1-5	0.871			
Pi5	3.595	0.908	1-5	0.844			
Pi6	3.441	0.901	1-5	0.827			
<i>Bminnov</i>					0.959	0.897	0.349
Bmi1	3.694	0.748	2-5	0.940			
Bmi2	3.766	0.726	2-5	0.973			
Bmi3	3.73	0.725	2-5	0.927			
<i>Csurv</i>					0.850	0.687	0.297
Surv1	4.18	0.729	2-5	0.894			
Surv2	4.162	0.681	2-5	0.898			
Surv3	3.892	0.846	1-5	0.808			
Surv4	3.748	0.889	1-5	0.701			

Note(s): Socnet=Social Network; Pinnov=Product Innovation; Bminnov=Business Model Innovation; Csurv=Capability to Survive

Source(s): output from the analysis results

Table 5. Heterotrait-Monotrait (HTMT)

Constructs	(1)	(2)	(3)	(4)
(1) Socnet				
(2) Pinnov	0.545			
(3) Bminnov	0.559	0.625		
(4) Csurv	0.699	0.514	0.552	

Note(s): Socnet=Social Network; Pinnov=Product Innovation; Bminnov=Business Model Innovation; Csurv=Capability to Survive

Source(s): output from the analysis results

Table 6. Structural Model

Relationship	β	t-value	p-value	f^2	Findings
Socnet \rightarrow Csurv	0.342	3.719	0.000	0.149	Supported (H1)

Relationship	β	t-value	p-value	f^2	Findings
Socnet → Pinnov	0.449	4.199	0.000	0.253	Supported (H2a)
Socnet → Bminnov	0.465	5.966	0.000	0.276	Supported (H2b)
Pinnov → Csurv	0.158	1.470	0.141	0.025	Not Supported (H3a)
Bminnov → Csurv	0.242	2.262	0.024	0.057	Supported (H3b)
Socnet → Pinnov → Csurv	0.071	1.408	0.159	-	Not supported (H4a)
Socnet → Bminnov → Csurv	0.113	1.998	0.046	-	Supported (H4b)

Note(s): Socnet=Social Network; Pinnov=Product Innovation; Bminnov=Business Model Innovation; Csurv=Capability to Survive

Source(s): output from the analysis results

Table 7. Coefficient of Determination (R^2)

Construct	R^2	R^2 adjusted
Capability to Survive (Csurv)	0.407	0.360
Product Innovation (Pinnov)	0.202	0.195
Business Model Innovation (Bminnov)	0.216	0.209

Source(s): output from the analysis results

Table 8. RMSE and MAE of PLS-SEM and LM

MV	Q^2 predict	PLS-SEM RMSE	PLS-SEM MAE	LM_RMSE	LM_MAE
Surv1	0.125	0.684	0.540	0.711	0.550
Surv2	0.116	0.644	0.501	0.668	0.521
Surv3	0.192	0.765	0.584	0.800	0.619
Surv4	0.139	0.828	0.644	0.868	0.654
Pi1	0.123	0.874	0.716	0.937	0.766
Pi2	0.135	0.873	0.672	0.895	0.709
Pi3	0.130	0.856	0.674	0.910	0.714
Pi4	0.153	0.870	0.716	0.931	0.760
Pi5	0.112	0.860	0.688	0.927	0.745
Pi6	0.112	0.853	0.685	0.908	0.742
Bmi1	0.165	0.688	0.565	0.730	0.589
Bmi2	0.207	0.650	0.507	0.682	0.522
Bmi3	0.145	0.676	0.543	0.709	0.569

Note(s): Pi=Product Innovation; Bmi=Business Model Innovation; Surv=Capability to Survive

Source(s): output from the analysis results

2. List of Figure

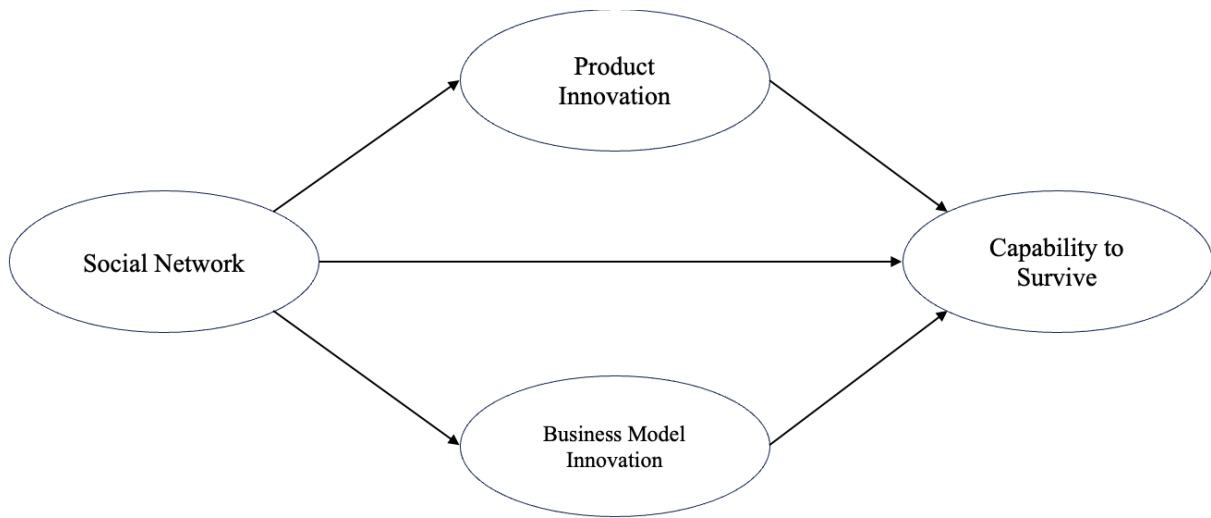


Figure 1. Conceptual Framework

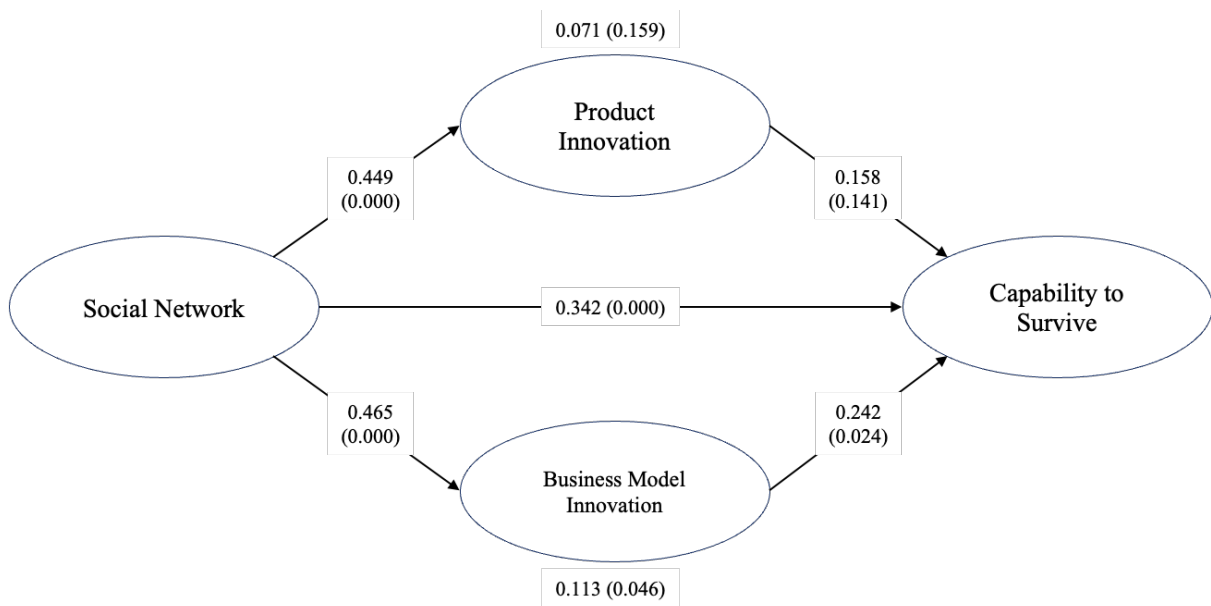


Figure 2. PLS-SEM Graphical Output



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MS0145: Exploring ESG-driven and ESG-driving Innovations: The Role of CSR Orientation of Thai Exporters

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Exploring ESG-driven and ESG-driving Innovations: The Role of CSR Orientation of Thai Exporters

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Abstract

Grounded in the resource-based view (Barney, 1991) and institutional theory (DiMaggio & Powell, 1983), this study explores the role of exporter CSR orientation, which refers to the strategic integration of environmental, social, and governance (ESG) considerations into a company's decision-making processes and corporate strategy (Brammer & Pavelin, 2006), on ESG-driven innovation and ESG-driving innovation in the context of Thai exporter firms. Thailand's societal and cultural framework incorporates merit-based and hierarchical structures, shaped by deep-rooted traditions, Buddhist values, and contemporary practices integrated among Thai firms. While the concept of ESG-driving innovation emphasizes how innovative practices, technologies, or business models can actively drive improvements in attaining sustainability goals (Tantalo & Priem, 2016), ESG-driven innovation focuses on the development of new products, services, processes, or business models that are specifically designed to address ESG issues (Kolk, 2006; Kraisornsuthasinee & Swierczek, 2006). Survey responses collected from 345 Thai exporter firms were initially analyzed by univariate and multivariate analyses. The overall results from construct bivariate correlated suggest that while CSR orientation has a stronger positive association with ESG-driving innovation relative to that with ESG-driven innovation, these associations vary across various resource-equipped exporter groups (e.g. low vs high financial resources) and different institutional contexts as

perceived by managers. These early insights imply that the role of CSR orientation on ESG innovation-related activities warrants further investigation.

Keywords: Institutional theory, Resource-based view, Emerging market, Thailand

Introduction

In recent years, the integration of Environmental, Social, and Governance (ESG) principles into corporate strategies has gained significant traction among Thai exporters. This shift is driven by increasing global demand for sustainable business practices and heightened awareness of the environmental and social impacts of corporate activities. Thai firms, particularly those engaged in international trade, are under pressure to align with global ESG standards to remain competitive in the global market (Pimpa, 2012). The country's societal and cultural framework, which blends traditional Buddhist values with modern influences, further shapes the approach of Thai exporters towards sustainability and corporate social responsibility (CSR). As Thailand seeks to enhance its global competitiveness, understanding the role of ESG orientation in fostering innovation within its export sector becomes increasingly vital (Kraisornsuthasinee & Swierczek, 2006).

Despite the growing emphasis on ESG practices worldwide, there is limited research on how ESG orientation specifically influences innovation within the context of Thai exporter firms. Much of the existing literature on CSR and ESG in international business has focused on Western contexts, with an emphasis on large multinational corporations (MNCs) (Aguilera et al., 2007; Brammer & Pavelin, 2006). These studies often overlook the unique cultural, institutional, and resource-based challenges faced by exporters in emerging markets like Thailand. Moreover, the distinction between ESG-driving and ESG-driven innovation has not

been adequately explored, particularly in the context of how firms strategically leverage CSR orientation to achieve sustainability goals. This gap highlights the need for more localized studies that consider the specificities of the Thai business environment and its influence on ESG-related innovation.

This study addresses the aforementioned gaps by providing a nuanced understanding of how CSR orientation influences both ESG-driving and ESG-driven innovation among Thai exporter firms. Grounded in institutional theory and the resource-based view (RBV), the study offers insights into how Thai exporters navigate the complexities of integrating ESG considerations into their innovation processes. By examining these dynamics within the context of Thailand's unique cultural and institutional landscape, this research contributes to the broader international business literature by expanding the understanding of CSR and ESG practices beyond Western-centric models. The findings also provide practical implications for policymakers and business leaders in Thailand and other emerging markets, offering strategies to enhance the global competitiveness of their firms through sustainable innovation.

Theoretical Underpinnings

This study draws on two relevant theoretical perspectives. One is institutional theory, which provides a robust framework for understanding how external pressures and societal norms influence the strategic behaviors of firms, particularly in the context of CSR and ESG orientation. According to institutional theory, organizations operate within a broader social framework that exerts pressure on them to conform to certain norms, rules, and expectations in order to gain legitimacy (DiMaggio & Powell, 1983). In the context of Thai exporter firms, institutional pressures from both domestic and international markets, such as regulations, customer expectations, and industry standards, play a critical role in shaping their CSR

orientation. These pressures compel firms to adopt ESG-driven innovations as a means to align with societal expectations and gain legitimacy in the global market. Moreover, the unique cultural and societal context of Thailand, which emphasizes hierarchical relationships and respect for authority, further reinforces the need for firms to adhere to institutional norms in their ESG practices (Scott, 1995).

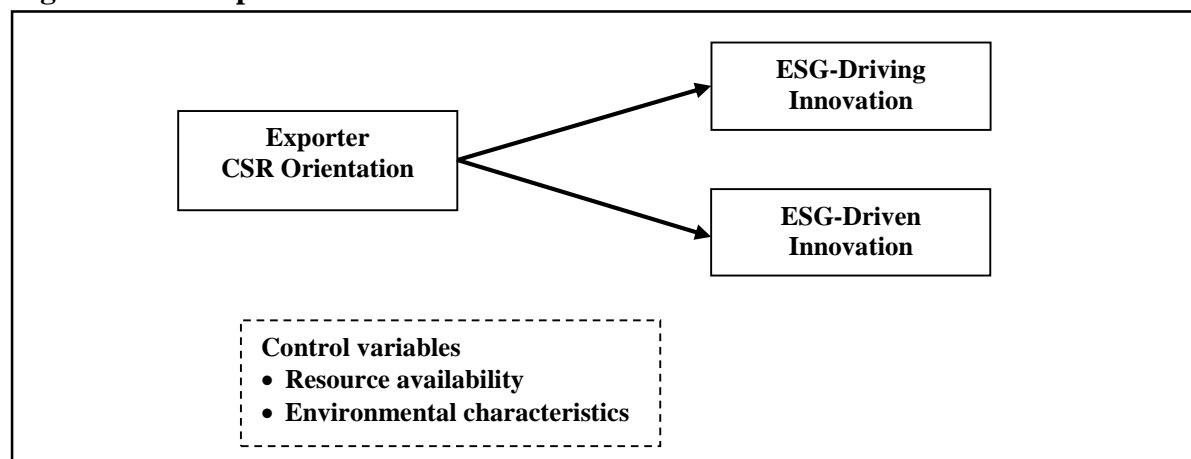
Specifically for the context of this study, institutional theory suggests that firms with a strong CSR orientation, driven by external pressures and the need for legitimacy, are more likely to develop innovations that directly address ESG issues. These innovations are often responses to regulatory requirements or societal demands for sustainable practices. Additionally, institutional theory suggests that firms that seek to lead in their industry by setting new standards for ESG practices may use their CSR orientation to drive innovations that not only comply with existing norms, but also push the boundaries of sustainability. This proactive approach may help Thai exporter firms to shape the institutional environment itself, influencing future regulations and market expectations.

Second, the resource-based view (RBV) offers another crucial perspective on the relationship between CSR orientation and innovation. RBV posits that a firm's competitive advantage is derived from its unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). In the context of Thai exporter firms, CSR orientation can be considered a strategic resource that contributes to the development of both ESG-driven and ESG-driving innovations. Firms with a strong ESG orientation are likely to possess valuable resources such as knowledge, expertise, and networks that enable them to create innovations aligned with sustainability goals. Furthermore, the ability to effectively integrate ESG considerations into business strategy and operations is a capability that enhances a firm's adaptability and responsiveness to environmental and social challenges (Hart, 1995). As such, firms with a strong ESG orientation leverage their unique resources to develop new products,

services, or processes that address specific ESG challenges. This type of innovation is driven by the firm's internal capabilities and strategic assets related to sustainability. Also, in driving innovation, firms that excel in leveraging their ESG-related resources can drive broader innovations that influence the entire industry. These firms not only respond to existing ESG issues, but also proactively develop new technologies and business models that set new benchmarks for sustainability.

Together, institutional theory and the resource-based view provide a comprehensive understanding of how CSR orientation influences ESG-driven and ESG-driving innovations in Thai exporter firms. Institutional theory highlights the external pressures and norms that compel firms to adopt ESG practices, while RBV emphasizes the internal resources and capabilities that enable firms to innovate in response to these pressures. The interplay between these external and internal factors is critical in explaining the strategic behaviors of Thai exporters as they navigate the complexities of sustainability in the global market. By integrating these two theoretical perspectives, this study offers a more nuanced explanation of how Thai firms can use their CSR orientation to achieve both compliance-driven and proactive innovations that enhance their competitiveness and contribute to broader sustainability goals. The conceptual model of this study is provided in Figure 1.

Figure 1. Conceptual Model



Research Methods

The sampling frame for this study is the Directory of Thailand Exports, which provides a list of manufacturing firms that engage in exporting activities. The questionnaire contained three parts including (1) firm activities and intentions, (2) firm demographics, and (3) respondent characteristics. The core variables of interest were adopted from existing multi-item scales and adapted to suit the Thai exporter context. Since these scales were initially developed in English, a back translation procedure from English to Thai, along with a pretest of the questionnaire to assess its functional equivalence and items. The final version of the questionnaire was sent to the identified key informant at the exporter firm. From the three-weeks of data collection, 356 questionnaires were returned. Univariate and multivariate preliminary data analyses were initially conducted using SAS. The correlation analyses of construct dimensions are reported in Table 1.

Table 1. Construct Reliability and Correlations

	No. of Items	Mean	Std. Dev.	1	2	3	4
1 ESGENVIRON	5	4.44	1.08	<i>0.627</i>			
2 ESGSOCIAL	7	3.54	1.06	-0.02	<i>0.827</i>		
3 ESGDRIVINGINN	8	4.44	0.98	0.08	0.34**	<i>0.906</i>	
4 ESGDRIVENINN	3	4.12	1.32	-0.07	0.38**	0.26**	<i>0.886</i>

Note: Construct Cronbach's alpha lie along the diagonal in italicized font.

** Correlation is significant at the 0.01 level (2-tailed).

Discussion of Preliminary Results

The preliminary findings from this study suggest that CSR orientation plays a pivotal role in influencing both ESG-driven and ESG-driving innovations within Thai exporter firms. The stronger association between CSR orientation and ESG-driving innovation indicates that firms with a robust commitment to ESG principles are not only responding to existing sustainability challenges but are also actively shaping the future landscape of sustainable business practices. This aligns with the principles of both institutional theory and the resource-based view, as firms leverage their unique resources and capabilities to meet and exceed institutional expectations. However, the varying strength of these associations across different resource-equipped exporter groups highlights the importance of internal resources in realizing the potential of ESG-oriented strategies. Firms with higher financial and human resources appear better positioned to capitalize on their CSR orientation, driving innovations that set new industry standards. This disparity underscores the need for more targeted support and resource allocation to help all firms, regardless of size or resource availability, fully harness the benefits of CSR orientation in driving sustainability-focused innovation.

Conclusion

In conclusion, this study contributes to the understanding of how CSR orientation influences innovation in the context of Thai exporter firms, offering valuable insights into the dynamics of ESG-driven and ESG-driving innovations. The findings underscore the importance of both external institutional pressures and internal resource capabilities in shaping a firm's innovation trajectory. For policymakers and business leaders in Thailand and other emerging markets, these insights highlight the need for a supportive regulatory environment and resource development strategies that can enhance firms' ability to innovate sustainably. By fostering a strong CSR orientation and equipping firms with the necessary resources, it is possible to drive

innovations that not only address current ESG challenges but also pave the way for a more sustainable future in the global marketplace. This study thus lays the groundwork for future research to further explore these dynamics, particularly in the context of different industry sectors and market conditions.

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MS0146: The Impact of Entrepreneurial Orientation and Employees' Digital Skills on Enterprise Digitalization: Moderating Effects of Environmental Uncertainty and Knowledge Absorptive Capacity

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The Impact of Entrepreneurial Orientation and Employees' Digital Skills on Enterprise Digitalization : Moderating Effects of Environmental Uncertainty and Knowledge Absorptive Capacity

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Abstract

In the wake of the COVID-19 pandemic since 2018, digitization has emerged as a critical strategy for enterprises to overcome crisis challenges. This shift has led to significant investment in digital tools by companies and their networks, along with a focus on enhancing employees' digital skills for the digital era's demands.

Digital transformation in enterprises is a multifaceted reform, covering strategy, organization, IT, supply chain, and marketing. Utilizing the Resource-Based Theory, this study investigates the key factors for successful digitalization strategy implementation in enterprises, emphasizing the role of entrepreneurial orientation and employee digital skills, and the potential moderating effects of environmental uncertainty and organizational absorptive capacity.

Conducted among 600 large service-oriented enterprises in Taiwan, the findings highlight the importance of innovativeness, risk-taking, and proactiveness in effectively driving internal digital projects. This research aims to enrich the understanding of the Resource-Based Theory, organizational learning theory, and enterprise digitization literature. It also provides a comparative analysis of the interrelationships among various dimensions influencing enterprise digital activities, offering a detailed examination of the key factors driving digital development

in enterprises.

Keywords: Entrepreneurial Orientation, Employees' Digital Skills, Level of Digitization, Environmental Uncertainty, Absorptive Capacity

1. Introduction

Over the past decade, digitalization has become a central focus in corporate strategy, with the COVID-19 pandemic accelerating the pace of transformation (Kraus et al., 2020; Klein & Todesco, 2021). Furthermore, as companies shift from manufacturing to software services, they face challenges such as organizational adjustments, business model changes (Baiyere et al., 2020), employee digital skills training (Eller et al., 2020), entrepreneurial orientation (Ritala et al., 2021), and top management's vision (Wrede et al., 2020). While much research has focused on the execution of digitalization (Marabelli & Galliers, 2017), less attention has been given to the internal traits that influence its success. This study, based on Resource-Based Theory and Organizational Learning Theory, argues that employees' digital skills and organizational entrepreneurial orientation are key drivers of digital transformation. It also explores how external factors, such as environmental uncertainty and absorptive capacity, moderate these relationships. By examining these internal and external factors, the study aims to provide deeper insights into the key success drivers of enterprise digitalization.

2. Literature Review and Hypothesis

2.1 Entrepreneurial Orientation

Entrepreneurial orientation (EO) plays a crucial role in digital transformation, especially in uncertain environments. Research shows that firms with strong EO—defined by innovation, proactiveness, and risk-taking—are better able to adapt to market changes and implement digital strategies (Ferreira et al., 2019; Covin & Lumpkin, 2011). The digitalization process mirrors entrepreneurship, requiring companies to revamp their operational models and face similar risks (Autio et al., 2018; Warner & Wäger, 2019). EO fosters employee innovation and openness to new technologies, driving successful digital transformation (Ritala et al., 2021; Zimmer et al., 2020).

2.2 Digital Skills of Employees

In the digital era, employees' digital skills, capabilities, and attitudes are essential for successful digital transformation strategies, beyond just the technology itself (Gilbert, 2006; Zimmer et al., 2020). Critical thinking, problem-solving, and collaboration are key digital skills (Sousa & Rocha, 2019). Employees with strong digital experience can better integrate tools like cloud computing for innovation (Assante et al., 2016). However, limited research has identified which specific employee attributes are most crucial for the successful implementation of digital strategies (Ritala et al., 2021).

2.3 Entrepreneurial Orientation and Degree of Digitalization

Entrepreneurial orientation, defined by innovation, proactiveness, and risk-taking, drives companies to adapt to technological changes and pursue digital transformation (Lumpkin & Dess, 1996; Wiklund & Shepherd, 2003). This orientation helps firms evolve business models and capture market innovations (Nambisan, 2017; Elia & Margherita, 2018). Companies with these traits are better positioned to integrate digital technologies into operations, fostering new processes and solutions (Hughes et al., 2018). Thus, fostering a culture of innovation, proactiveness, and risk-taking is key to successful digital transformation. Based on this, hypotheses H1a, H1b, and H1c are proposed.

H1a: There is a positive relationship between a company's innovativeness traits and the degree of digitalization.

H1b: There is a positive relationship between a company's proactiveness traits and the degree of digitalization.

H1c: There is a positive relationship between a company's risk-taking traits and the degree of digitalization.

2.4 Employees' Digital Skills and the Degree of Digitization

According to resource-based theory, employee digital skills and technology application are vital organizational assets for successful digital transformation (Verhoef et al., 2019). Companies must cultivate diverse digital skills, such as big data analysis, AIOT, cloud computing, and ERP, alongside fostering a culture of continuous learning (Belderbos et al., 2019; Sousa & Rocha, 2019). Employees'

critical thinking, problem-solving, and collaboration skills are essential for driving digital strategies (Sousa & Rocha, 2019). Strong digital capabilities enable organizations to effectively integrate and apply emerging technologies, contributing to digital transformation success (Kane et al., 2015). Based on this, hypothesis H2 is proposed.

H2: There is a positive relationship between employees' digital skills and the level of digitalization within the organization.

2.5 The Moderating Effect of Environmental Uncertainty

Contingency theory posits that external environmental uncertainty influences the relationship between entrepreneurial orientation, employee digital skills, and digitalization (Burns & Stalker, 1961; Covin & Slevin, 1991). High uncertainty in technology and market dynamics accelerates digital transformation, as firms must adapt quickly to complex environments (Jiang & Ma, 2018). Firms with entrepreneurial orientation—defined by innovation, proactiveness, and risk-taking—are more likely to adopt new digital technologies in uncertain environments (Wiklund & Shepherd, 2005). Thus, organizations with entrepreneurial orientation and skilled employees actively embrace digitalization to meet market demands. Based on this, hypotheses are proposed.

H3a: Environmental uncertainty positively moderates the positive relationship between the innovative traits of enterprises and the level of digitalization.

H3b: Environmental uncertainty positively moderates the positive relationship between the proactive traits of enterprises and the level of digitalization.

H3c: Environmental uncertainty positively moderates the positive relationship between the risk-taking traits of enterprises and the level of digitalization.

H4: Environmental uncertainty positively moderates the positive relationship between employee digital skills and the level of digitalization in enterprises.

2.6 Moderating Effect of Absorptive Capacity

A company with entrepreneurial orientation and high absorptive capacity is more adept at identifying and acquiring innovative opportunities and knowledge through formal and informal channels (Rothaermel & Alexandre, 2009). Firms with these traits, combined with absorptive capacity, can

integrate external resources and capitalize on market opportunities (Cohen & Levinthal, 1990). Absorptive capacity enables firms to internalize digital knowledge, accelerating digital transformation (Matthyssens et al., 2005). However, success requires integrating this knowledge into business processes and operations (Roberts et al., 2012). Therefore, firms with strong absorptive capacity are better positioned to drive digital transformation. Based on this, hypotheses H5a, H5b, H5c, and H6 are proposed.

H5a: Absorptive capacity positively moderates the positive relationship between a company's innovativeness and its level of digitization.

H5b: Absorptive capacity positively moderates the positive relationship between a company's proactiveness and its level of digitization.

H5c: Absorptive capacity positively moderates the positive relationship between a company's risk-taking propensity and its level of digitization.

H6: Absorptive capacity positively moderates the positive relationship between employees' digital skills and a company's level of digitization.

3. Research Methodology and Result

3.1 Operational Definitions

Entrepreneurial orientation reflects a firm's ability to drive digital innovation. This study draws on the 14-item measurement of entrepreneurial orientation from Niemand et al. (2021) and Eggers et al. (2013), covering innovativeness, risk-taking, and proactiveness. Digital skills include critical thinking, problem-solving, and collaboration. Employees with strong digital experience can integrate new tools into business processes, enabling digital transformation and innovation. This study uses Eller et al.'s (2020) 4-item scale for digital skills. Degree of digitalization measures how well companies use digital tools to enhance customer relationship management, communication, and value creation, following frameworks by Jayachandran et al. (2005) and Kohtamäki et al. (2020), with four sub-dimensions: digital marketing, services, analytics, and data integration. Absorptive capacity, based on Zahra and George (2002) and

Jansen et al. (2005), defines a firm's ability to acquire, assimilate, and utilize knowledge for digital growth. Environmental uncertainty, drawn from McKelvie, Haynie, and Gustavsson (2011), concerns unpredictability in technology, markets, and institutions.

3.2 Data Collection

This study focuses on medium- to large-scale service industries with the capacity to invest in digitalization, ensuring a more representative sample. Targeting the top 500 service companies in Taiwan, as published by CommonWealth Magazine, surveys will be distributed to gain precise insights into the key factors driving successful digitalization strategies. The findings will provide valuable references for future digitalization efforts in Taiwan's service industry.

3.4 Result

The Cronbach's alpha values for the constructs in this study ranged from 0.961 to 0.782, exceeding the 0.7 threshold. This indicates a high level of internal consistency in the measurement items for all variables, suggesting good reliability. Validity testing measures whether a research method effectively captures the issues researchers intend to study. The factor loadings ranged from 0.882 to 0.621, meeting the standard of being greater than 0.5. Additionally, the AVE values for all constructs ranged from 0.541 to 0.689, satisfying the threshold of greater than 0.5 as per Fornell & Larcker (1981).

4. Discussion

4.1 Entrepreneurial Orientation and Digitalization Level

The study finds that firms exhibiting innovativeness, risk-taking, and proactiveness are more likely to successfully implement digital projects (H1a~H1c supported). This aligns with Niemand et al. (2021), who suggest that entrepreneurial orientation not only drives firms to pursue digitalization but also enables them to seize new opportunities in digital markets, such as AIOT and e-commerce. For companies undergoing digital transformation, fostering an entrepreneurial culture is crucial for aligning internal efforts toward digital success.

4.2 Digital Skills and Digitalization Level

Similarly, the results indicate that employees' digital skills significantly enhance the likelihood of

successful digital transformation (H2 supported). This finding corroborates previous research by Jandric, Sousa, Ceipek, and others, highlighting that human capital is a core challenge in digitalization, particularly when employees lack the necessary skills to execute digital projects smoothly.

4.3 Moderating Effect of Environmental Uncertainty

The study shows that higher environmental uncertainty strengthens the impact of employees' digital skills on the digitalization level (H4 supported). This suggests that in rapidly changing markets, digital skills help firms adapt by enabling them to implement innovative digital solutions, such as cloud computing or big data analytics, to stay competitive and respond quickly to market shifts.

4.4 Moderating Effect of Absorptive Capacity

The results indicate that absorptive capacity positively moderates the relationship between employees' digital skills and digitalization (H6 supported). This finding is consistent with Cohen and Levinthal's (1990) theory that a firm's existing knowledge base determines its ability to learn and apply new external knowledge. Firms with high absorptive capacity are better positioned to identify and exploit emerging technologies, accelerating internal digital transformation initiatives.

4.5 Environmental uncertainty did not significantly moderate the relationship between entrepreneurial orientation and digitalization

This may be due to the varying sensitivities of different service sub-industries, such as finance and food services, to external changes. Organizational inertia may also play a role, with firms relying on past successful strategies and being slow to adapt to uncertainty. Similarly, absorptive capacity did not significantly moderate the entrepreneurial orientation–digitalization relationship, possibly due to differences in technological adaptability across service industries, where more traditional sectors may exhibit a lower enthusiasm for digital innovation.



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MS0147: A Global Public Good for Counter-terrorism? Assessing the Impact of the Belt and Road Initiative

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A global public good for counter-terrorism? Assessing the impact of the Belt and Road

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Abstract

As terrorism has become a grand challenge and security has evolved into a significant form of global public goods (GPGs), international cooperation is recognized as an effective strategy for counter-terrorism. The Belt and Road Initiative (BRI) brings a rare opportunity to explore the role of international cooperation in counter-terrorism. Panel data covering 152 countries from 2004 to 2018 were used to evaluate time-varying difference-in-differences models. The BRI was found to reduce terrorist activities. However, the effectiveness of the BRI in counter-terrorism is weakened by political instability, geographic distance and cultural distance. These findings have useful implications for governments and MNEs.

Keywords: International Business Theory; Cultural Distance; Grand Challenges; Counter-Terrorism; Belt and Road Initiative

1. Introduction

Studies in management and economics are increasingly underscoring the crucial role of Global public goods (GPGs) (Buchholz & Sandler, 2021). Despite peace and security emerging as significant categories of GPGs, counter-terrorism continues to confront numerous challenges. International cooperation has the potential to create global communities, which could contribute to the provision of GPGs encompassing areas such as national security, economic development, cultural exchange, academic cooperation, and more. In particular, international cooperation is viewed as a comprehensive and effective strategy for counter-terrorism (Abadie & Gardeazabal, 2008).

However, it is critical to note that the full potential of international cooperation remains underexploited in counter-terrorism endeavors. Moreover, empirical evidence examining the influence of international cooperation on counter-terrorism is notably limited. Like many other international organizations, the BRI may go beyond its primary focus on economic cooperation to provide GPGs like counter-terrorism for participating countries. Therefore, the BRI brings a rare opportunity to explore the role of international cooperation in counter-terrorism.

Multiple databases were merged, including the Global Terrorism Database and the World Development Indicators database. A panel of data covering 152 countries from 2004 to 2018 was used in time-varying difference-in-differences (time-varying DID) analysis seeking any effects of BRI participation on terrorist activity.

2. Literature and Theory Development

This paper focuses on whether BRI cooperation can help reduce the threat of terrorism for IB, as well as the mechanisms behind it. Based on the extant research on GPGs, terrorism and the BRI, we propose seven hypotheses below.

Hypothesis 1: Participating in the BRI is likely to help a country reduce terrorist activities.

Hypothesis 2: BRI participation promotes trade, which predicts less terrorist activity in the participating countries.

Hypothesis 3: BRI participation can reduce terrorist activities by promoting the development of digital infrastructure in the participating countries.

Hypothesis 4: BRI participation can reduce terrorist activities by promoting economic development in the participating countries.

Hypothesis 5: The effect of the BRI on reducing terrorist activities is negatively moderated by the civil war.

Hypothesis 6: The effect of the BRI on reducing terrorist activities is negatively moderated by geographic distance and cultural distance.

Hypothesis 7: Terrorist activities reduce inward investment from MNEs in the affected country.

Figure 1 shows the theoretical framework of this paper.

----- Figure 1 goes about here -----

3. Methods

To explore whether BRI participation can help reduce terrorism, the relationship between BRI participation and terrorist activity was quantified. The launch of the BRI can be considered as a quasi-natural experiment, so difference-in-differences (DID) analysis was applied. Time-varying DID model can identify the effects of the BRI on terrorist activity more accurately by allowing different policy shock timings for different participating countries. Time-varying DID model can also avoid some endogeneity problems, and it allows inferring cause and effect relationships (Beck et al., 2010).

The specific time-varying DID model was

$$y_{i,t} = \beta \cdot b\&r_join_{i,t} + X_{i,t} \cdot \gamma + \nu_i + \mu_t + \varepsilon_{i,t} \quad (1)$$

where $y_{i,t}$ is one of either *ln_{case}* (the logarithm of the number of terrorist attacks) or *ln_{casualty}* (the logarithm of the number of casualties caused by terrorist attacks) evaluated for country i in year t . The dummy variable $b\&r_join_{i,t}$ indicates whether or not country i

participated in the BRI in year t . $X_{i,t}$ represents a set of control variables. ν_i and μ_t represent country fixed effects and year fixed effects, respectively. $\varepsilon_{i,t}$ is a randomly distributed error term centered on zero. The magnitude of the coefficient (β) indicates the BRI's influence on terrorist activity and casualties.

4. Results

The results clearly show that BRI participation can significantly reduce terrorist attacks (the frequency and severity of terrorist attacks).

And our empirical evidence not only supports the parallel trends assumption but also reveals a dynamic effect of the BRI.

In terms of mechanisms, we adopt the causal steps approach (Baron & Kenny, 1986) and the bootstrapping method (Hekman et al., 2017) to examine how the BRI works to reduce terrorist attacks. The results show that the BRI can promote counter-terrorism by improving MNE trade, digital infrastructure, and economic development in general.

However, the effectiveness of the BRI in counter-terrorism will be weakened by political instability, geographic distance and cultural distance to a large extent.

What's more, the BRI can facilitate the FDI by reducing terrorist attacks in the participating countries.

In addition, the paper has considered potential endogeneity and conducted many robustness checks to further provide support for these hypotheses.

5. Discussion and Conclusions

There are some main theoretical contributions. First, this paper can contribute to the research on GPGs, especially public value creation. The provision of counter-terrorism still faces a lot of challenges although peace and security have become increasingly important

forms of GPGs. International cooperation is viewed as an effective strategy for counter-terrorism (Abadie & Gardeazabal, 2008), but empirical evidence regarding the impact of international cooperation on counter-terrorism remains scarce. This study focuses on the role of international cooperation in counter-terrorism. And the results confirm the effectiveness of a strategy of “peace through development” in international cooperation.

Second, this paper also advances the extant literature on terrorism governance by analyzing the conditions that facilitate the effectiveness of counter-terrorism efforts. In terms of political stability, civil wars may play a significant role in increasing terrorist activities (Campos & Gassebner, 2013). Based on the moderating effect analysis, we find that the effectiveness of the BRI in counter-terrorism will be weakened by political instability to a large extent. In terms of cross-national distance, we find that geographic distance and cultural distance from China can also mitigate the effectiveness of the BRI in counter-terrorism to a large extent.

Third, this paper also contributes to the research on the influences brought by the BRI to the participating countries. Previous BRI studies have focused on BRI’s economic impacts, such as import and export, FDI, infrastructure investment, and economic development. So they seem to ignore the BRI’s ability to provide a GPG for counter-terrorism.

This paper provides practical implications for governments and international cooperation against terrorism. This paper also provides practical implications for MNEs. For instance, the results suggest that MNEs should take advantage of international cooperation like the BRI when investing abroad. Terrorism is an important type of political risk that MNEs cannot ignore (Li et al., 2022).

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7. Figures

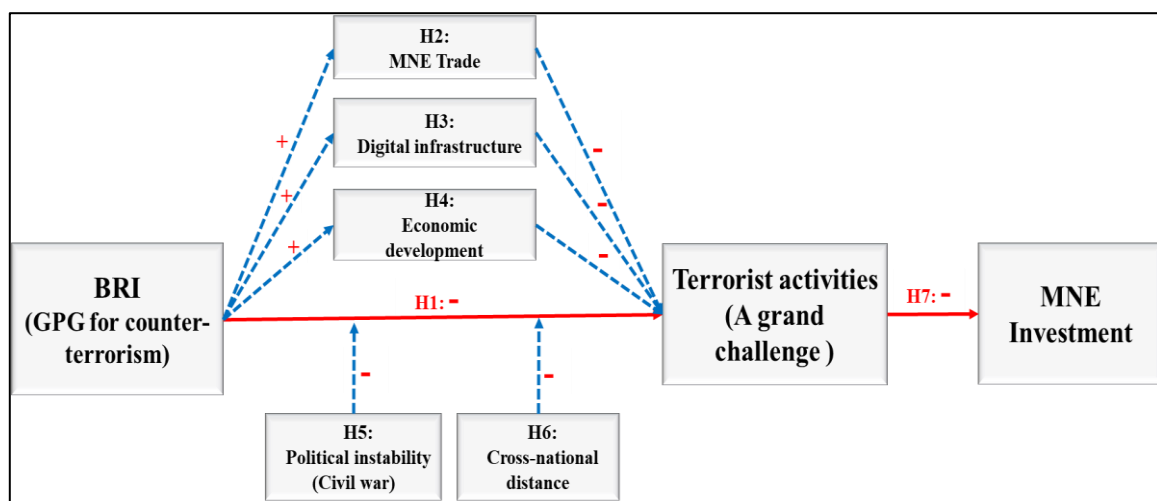


Figure 1 Theory Framework



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MS0148: The Impact of CSR on Acquisition Completion for Acquiring Firms from Emerging Economies

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The Impact of CSR on Acquisition completion for Acquiring Firms from Emerging Economies
—A Study of Multinational Enterprises in China

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Extended Abstract

This study investigates how the Environmental, Social, and Governance (ESG) performance of acquirers in emerging economies affects cross-border acquisition (CBA) completions and how this effect varies according to the internationalization of the acquiring firms. Using a sample analysis of CBAs of Chinese listed firms from 2010 to 2019, we find that Chinese acquirers with higher ESG performance are more likely to successfully complete CBAs. As the internationalization of acquiring firms increases, these acquirers gain a greater advantage in completing CBAs.

Keyword: Emerging economy, cross-border acquisition, Internationalization

1. Introduction

Since the 1990s, multinational enterprises (MNEs) from emerging markets (EMNEs) have become

significant players in global trade and investment (Kim, 2017). However, they often enter global industries later than developed economies, resulting in gaps in technology and productivity (Abramovitz, 1986; Awate et al., 2012). Luo and Tung (2007) argue that acquisitions are the fastest way for EMNEs to catch up. Yet, many cross-border acquisitions (CBAs) fail, and the completion rate is low (Zhou et al., 2016; Tuch & O'Sullivan, 2007; Hassan & Ghauri, 2014). CBAs are more complex and uncertain than domestic deals (Zhou et al., 2016), and EMNEs face challenges from weaker home institutional frameworks, raising legitimacy concerns abroad (Marano, 2017; Cuervo-Cazurra & Ramamurti, 2014). Foreign stakeholders may hold negative perceptions based on stereotypes (Kostova & Zaheer, 1999).

The role of Environmental, Social, and Governance (ESG) factors in mergers and acquisitions has gained attention. Research indicates that EMNEs with higher ESG risks are more likely to fail in CBAs (Zhu et al., 2023), and negative media coverage can derail deals (Hawn, 2020). Conversely, strong ESG performance can counter stereotypes and correlate with greater cumulative abnormal returns (CAR) (Aktas et al., 2011) and improved post-acquisition performance (Deng et al., 2013). Therefore, commitment to ESG can help EMNEs overcome legitimacy challenges in CBAs. This study examines how ESG performance affects acquisition completion and how this relationship is moderated by internationalization.

2. Literature and framework

EMNEs face two key legitimacy challenges during international expansion: liability of foreignness and liability of origin (Hymer, 1976; Zaheer, 1995). These include information asymmetry, local bias, and unfamiliarity with host countries, further complicated by negative perceptions of the EMNEs'

country of origin (Stevens & Shenkar, 2012). Traditionally, it was thought that EMNEs should expand into regions similar to their home countries (Bingham & Eisenhardt, 2011), but recent trends show EMNEs acquiring in vastly different regions, complicating predictions on how they manage legitimacy issues during acquisitions.

Stakeholders in target countries often rely on external information to assess foreign acquirers, and ESG behavior plays a critical role (Zhu et al., 2023). Negative ESG records can lead to opposition from stakeholders, while better ESG performance can mitigate uncertainty and foster trust, leading to smoother acquisitions (Liang et al., 2017; Hawn, 2013). Hence, acquirers with strong ESG performance are more likely to complete acquisitions successfully.

Hypothesis 1. EMNEs with better ESG performance are more likely to complete cross-border acquisitions.

As Chinese multinational enterprises (MNEs) grow rapidly, they face increasing scrutiny from stakeholders due to their heightened international visibility. This makes them more vulnerable to public opinion. Aguilera-Caracuel et al. (2015) note that MNEs are under pressure to engage in corporate social responsibility (CSR) and positively impact society in their operating regions.

Christmann (2014) found that firms in international markets must respond to diverse stakeholder demands, including compliance with host-country regulations. Thus, ESG performance becomes crucial for more internationalized firms, particularly during acquisition activities.

Hypothesis 2. The internationalization of acquiring firms positively mediates the relationship between ESG performance and the successful completion of acquisitions.

3. Method and results

We collected data from Chinese A-share listed corporations in the CSMAR database for 2010–2019, resulting in 256 observations after excluding special treatment firms and those with missing data. Given China's status as the largest emerging economy, its acquirers face increasing scrutiny from external stakeholders (Zhu et al., 2023). We retained data on transactions over 1 million RMB.

Acquisition completion was coded as 1 if completed after the public announcement of a foreign takeover attempt, and 0 otherwise. The primary explanatory variable, ESG score, sourced from Hexun.com, evaluates corporate social responsibility across five dimensions: responsibility to shareholders, employees, suppliers, customers, the environment, and society. A higher ESG score indicates better social responsibility performance (He et al., 2023; Yu & Xiao, 2022).

Internationalization was measured as the percentage of foreign sales to total sales (Sullivan, 1994). We controlled for country attribute (1 for European, 0 otherwise), transaction value (log-transformed), industry type (1 for highly polluting, 0 otherwise), firm size (log-transformed total revenue), acquisition experience (successful acquisitions in the past ten years), Tobin's Q, and whether the acquired firm is state-owned..

The analysis of 256 cross-border acquisitions by Chinese listed firms from 2010 to 2019 supports both hypotheses. Higher ESG performance increases acquisition success by enhancing legitimacy and stakeholder trust (Hypothesis 1). Additionally, the relationship between ESG performance and success is strengthened by the firm's level of internationalization (Hypothesis 2), as internationalized firms face greater scrutiny, making strong ESG performance even more crucial for completing acquisitions.

4. Conclusion

This study highlights the critical role of ESG performance in the success of cross-border acquisitions by EMNEs. Firms with stronger ESG records gain more stakeholder trust, easing the complexities of international transactions. Internationalization further strengthens this effect, as more global exposure increases scrutiny, making ESG performance even more crucial.

The findings indicate that highly internationalized firms with better ESG practices see improved acquisition success due to heightened stakeholder focus on social responsibility. The importance of both ESG and internationalization strategies is clear, and firms must enhance their ESG efforts as they expand globally. Future research could examine how regional and industry-specific ESG expectations impact acquisition outcomes.

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MS0149: A Review of Research on the EMNEs' Catch-up

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A Review of Research on the EMNEs' Catch-up

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Extended Abstract

This study explores the technological catch-up of emerging market multinational enterprises (EMNEs), focusing on strategies like imitation and innovation. It highlights internal factors such as absorptive capacity and managerial skills, alongside external influences like government support and market conditions. A review of 21 papers (2005–2023) emphasizes Chinese firms' prominence in catch-up research. While imitation helps gain market share, the findings call for further exploration of innovative strategies to drive competitive growth.

Keyword: Technological Catch-up, Emerging Market Multinational Enterprises (EMNEs)

1. Introduction

Technological catch-up is a key research area in emerging market multinational enterprises (EMNEs), gaining prominence since the 1980s and remaining crucial in international business. The rise of EMNEs, particularly in BRIC countries (Brazil, Russia, India, China, and South Africa) since 2000, shows their efforts to close the gap with developed market firms (DMNEs) (Kashani et al., 2022).

While some scholars argue that leading firms create barriers to entry, latecomers have sometimes surpassed industry leaders (Kang & Song, 2017). Disparities in income, productivity, and skills often

result from differences in technological capabilities (Crafts & O'Rourke, 2014), but EMNEs are finding opportunities to catch up through changes in knowledge, demand, and policy (Lee & Malerba, 2017). This study aims to enhance understanding of the factors influencing EMNE catch-up and contribute to research on firm advancement.

2. Literature and framework

Catching up refers to the process where latecomer firms in emerging economies work to close the gap with industry leaders despite technological and market disadvantages (Hobday, 1995). These firms struggle with limited access to R&D and innovation in developed countries and face growth challenges due to their distance from mainstream international markets and underdeveloped local markets (Hobday, 1995).

2.1. Strategies for catching up

Xiao et al. (2013) identified two main catch-up strategies: imitation and innovation. For example, the Chinese company Grace became a leader in adhesive spinning yarn through imitation in the 1990s. While imitation helps close performance gaps (Posen & Martignoni, 2018), it often limits innovation, as seen with India's Suzlon compared to Denmark's Vestas (Awate et al., 2015). In contrast, Chinese automakers partnered with foreign firms to acquire advanced technologies (Hertenstein & Alon, 2022), with ChangHong and Chery using these collaborations to catch up (Xiao et al., 2013). Buckley and Hashai (2014) argue that EMNEs globalize to explore new opportunities. Awate et al. (2015) found knowledge flow in EMNEs often depends on parent companies, using springboard theory for catch-up. Schaefer (2020) notes latecomer firms invest in R&D centers abroad to boost competitiveness. Catch-up strategies can be focused or ambidextrous, with springboard theory key to moving from imitation to innovation (Choi et al., 2020; Hu et al., 2022).

2.2. Internal and external factors

Choi et al. (2020) highlight that firms' catch-up strategies are shaped by their competitive industry environment, affecting sustainable growth potential. Absorptive capacity, or the ability to acquire and apply knowledge, is critical (Hu et al., 2022). Government support also plays a key role, as seen with China Datang Group and Fiberhome (Zhang, 2021). The catch-up process is influenced by external factors such as the institutional environment, political system (Wei et al., 2020; Saranga, 2019), industrial context, economic conditions (Kang, 2017), and intellectual property rights (Mets et al., 2010), along with internal factors like learning ability (Zhang, 2021) and managerial competence (Berry, 2006).

3. Method and results

We searched Web of Science using the keywords "catch up" and "EMNE" or "Emerging," focusing on Management and Business. Our analysis targeted papers published between 2005 and 2023 in leading management journals, resulting in the selection of 21 relevant papers on firms.

Figure 1 illustrates the rising citation rate and the growing number of published papers in the field of catch-up, highlighting increased scholarly emphasis since 2012, with citations peaking at 195 in 2021.

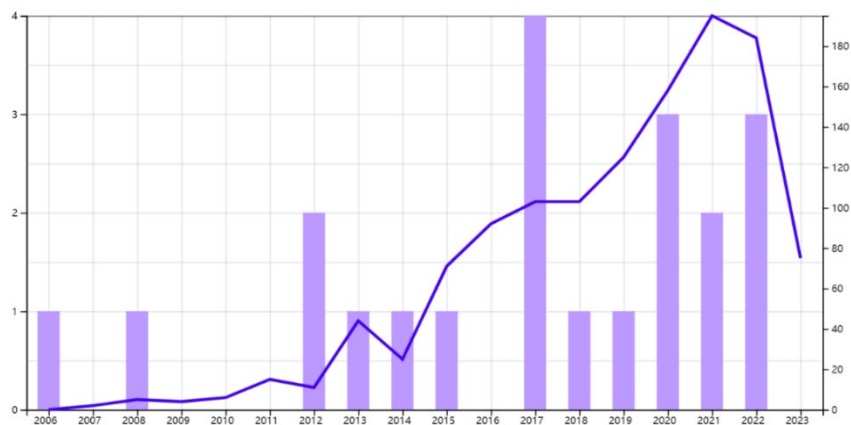


Fig. 1. Number of publications and citation network of catch-up literature in 2006–2022.

Research Policy (RP) was the leading journal for catch-up publications, with seven articles, followed

by *Global Strategy Journal*, *Journal of International Business Studies*, and *Strategic Management Journal*, each with three. The *International Business Review* and *Journal of Business Research* published two papers each, while *R&D Management* published one. Among authors publishing in EMNE catch-up journals, R. Mudambi leads with four publications, followed by S. Awate, C. Giachetti, M. M. Larsen, H. Sarange, L. Cui, and Y. Liu, each with two publications.

Research focused on regional enterprises shows that Chinese firms have been the subject of ten studies, making them the most researched in the field of catch-up, followed by India with five studies. This indicates that the technological catch-up of Chinese firms is a highly popular topic among scholars.

Overview of the Determinants of Catch up

Factors influencing catch-up include both facilitating and moderating elements. EMNEs can catch up with DMNEs through imitation, learning, or innovation, primarily regarding market share, patents, and output. Internal factors such as absorptive capacity, learning ability, and management skills positively moderate this process. Additionally, external factors like government policy, economic systems, and industrial environments also support EMNEs in catching up with DMNEs.

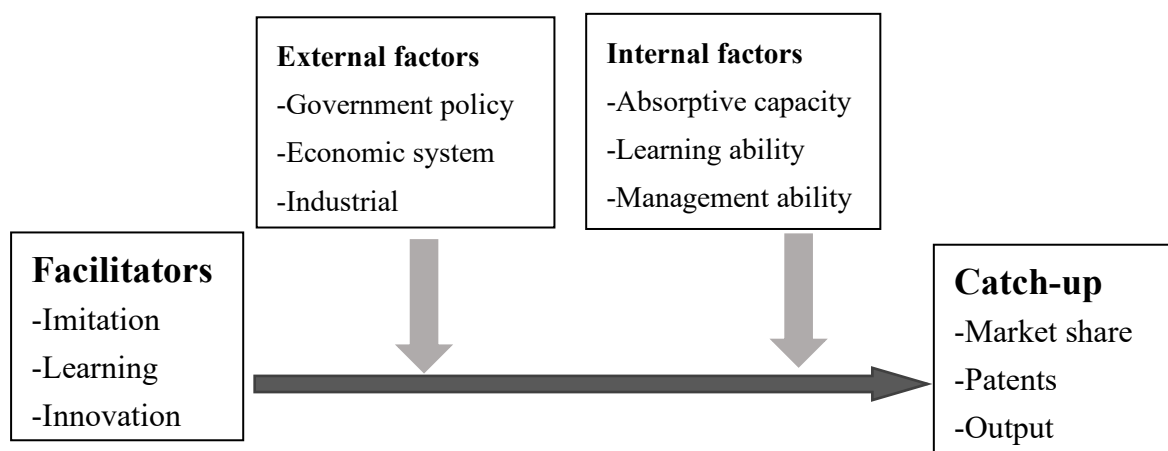


Fig. 4. Framework.

Keyword analysis

Keywords convey the core content of the article and help identify research and development directions.

We summarized the top five keywords: "Catch-up," "Emerging," "Imitation," "Innovation," and "Window of Opportunity," which offer valuable insights for future research.

4. Discussion

We summarize the factors related to catch-up studies from recent literature. EMNEs employ strategies of imitation, learning, and innovation to catch up with DMNEs, while also considering the country's political system, economic conditions, and industrial environment. Additionally, it is essential to take into account the learning capacity of EMNEs and the capabilities of their managers. Furthermore, this research highlights the need for future studies focused on exploratory innovation.

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MS0150: Navigating Sanctions: The Impact on Product Diversification and International Diversification Strategies

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Navigating Sanctions: The Impact on Product Diversification and International Diversification Strategies

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Extended Abstract

This study examines how sanctions affect the diversification strategies of impacted companies. Using difference-in-differences estimation, our empirical results indicate that U.S. sanctions on relevant industries significantly increased product diversification while reducing international diversification. We further considered the role of internal and external resources in this process and found that these effects are moderated by government subsidies and organizational slack. The implications of these findings underscore the importance of understanding the interplay between institutional transformation and firm-specific resources in shaping strategic responses.

Keyword: Diversification; U.S. sanction; Organizational slack; Government subsidy

Firm diversification has long been a focal topic in strategic management literature, with extensive research highlighting the factors that influence firms' decisions to expand their operational scope. Scholars have identified various drivers, such as institutional environments, market conditions, and firm-specific resources, that compel firms to diversify strategically (Cuervo-Cazurra et al., 2018; Delios et al., 2008; Wan et al., 2011). Recent findings suggest that institutional shifts compel firms to adapt their market scopes to navigate the evolving rules and structures of the market, highlighting the dynamic interplay between institutional environments and corporate strategy (Lee et al., 2008; Ramaswamy et al., 2017; Zhou & Peng, 2010; Zhou & Delios, 2012).

Despite existing discussions on the relationship between institutions and diversification, a critical gap remains in understanding the effects of institutional shocks — particularly sanctions — on firm diversification strategies. In the current era of geopolitical tensions, where sanctions are frequently employed as tools of economic policy, it is imperative to study how these institutional shocks affect firms' strategic choices and their interactions with both internal and external resources.

In this study, we aim to explore how firms strategically respond to institutional changes such as sanctions imposed on peer firms. Our research questions focus on identifying which firms are more likely to take action in response to these institutional shocks and how their diversification strategies are impacted. The results revealed how firms' diversification strategies evolve in response to changes in the institutional environment, highlighting which types of firms are more likely to adjust their operations.

To better understand how firms make strategic decisions under institutional transitions, real options theory (ROT) provides a robust framework by applying financial options logic to real-world corporate investments (Myers, 1977; Dixit & Pindyck, 1994). As decoupling increases uncertainty on international market (Witt et al., 2023), these risks reduce the option value of international diversification, making it less attractive, they may pivot towards domestic markets and increased product diversification, allowing them to mitigate risks by spreading investments across various sectors. Thus, we propose hypotheses 1:

Hypothesis 1a: Sanctions imposed by the U.S. government on relevant Chinese industries increase the degree of product diversification of these firms.

Hypothesis 1b: Sanctions imposed by the U.S. government on relevant Chinese industries decrease the degree of international diversification of these firms.

Resources play a critical role in this process, acting as risk buffers that help firms absorb shocks from decoupling (Tong & Reuer, 2007). Slack resources provide flexibility for firms to respond to environmental changes, enhancing their adaptability and innovation (De Carolis et al., 2009). Meanwhile, government subsidies serve as vital external resources for firms facing sanctions, as they mitigate financial and operational risks and help maintain competitiveness in a complex global landscape (Wang & Xie, 2021; Witt et al., 2023). Conversely, companies lacking these resources are more likely to make strategic adjustments for risk management when facing sanctions. Therefore, we propose hypotheses 2 and 3:

Hypothesis 2a: Organizational slack decreases the positive relationship between sanction and product diversification.

Hypothesis 2b: Organizational slack decreases the negative relationship between sanction and international diversification.

Hypothesis 3a: Government subsidies decreases the positive relationship between sanction and product diversification.

Hypothesis 3b: Government subsidies decreases the negative relationship between sanction and international diversification.

To examine the impact of sanctions, we conducted a staggered difference-in-differences estimation using sanction data from the Entity List published by U.S. Bureau of Industry and Security and company-level data from CSMAR and WIND databases. We recorded the first instance when companies within these sectors were listed, which serves as the point of external shock. After matching between these datasets, 1,554 of listed companies in China were screened as a treatment group, ranging from 2013 to 2022.

For the dependent variables, product diversification (PD) and international diversification (ID) are measured using the Herfindahl-Hirschman Index, based on the distribution of sales across industries and overseas regions separately. The independent variable, post-sanction, is a dummy variable equals 1 after the first company in the industry was listed on the Entity List, equals 0 otherwise. For moderators, Organizational slack is measured by current ratios (Iyer & Miller, 2008; Yang et al., 2014), and Government subsidies is the logarithm of the amount of government subsidies. We include control variables such as firm size, performance, growth, age, leverage, debt-to-equity ratios, R&D intensity, market intensity, board independence, and CEO duality, along with firm and year fixed effects in all models.

The results of our model on the full sample indicate that our hypotheses 1, 2, and 3 are all supported. We found that sanctions against certain firms within the industry lead to an increase in product diversification among their peers, while decrease their international diversification. Additionally, for firms with limited resources, the necessity to adjust operational strategies becomes even more crucial.

This article presents three key theoretical contributions: First, it enriches the institution-based view by analyzing how firms strategically respond to institutional shocks and changes, with a particular emphasis on the impact of sanctions on their strategic decisions. Second, it explores the boundary conditions under which firms are more likely to implement strategic responses to sanctions, considering both internal and external resources. Finally, this research expands our understanding of strategic shifts from international diversification to market diversification, incorporating the influence of macro-level factors that extend beyond firm-specific strategies.

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MS0151: The Interplay of Digitalization and Innovation on Internationalization: Empirical Evidence from Traditional Chinese Medicine Firms

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The Interplay of Digitalization and Innovation on Internationalization: Empirical Evidence from Traditional Chinese Medicine Firms

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Extended Abstract

This paper examines the relationships between digitalization, innovation, and internationalization, focusing on their interaction. It also explores the moderating role of China's "Dual Circulation Policy." Evidence of Traditional Chinese Medicine (TCM) firms show digitalization boosts internationalization but hinders innovation. The interaction negatively impacts internationalization, though firms in more open provinces, with higher Inward Foreign Direct Investment (IFDI) and Intellectual Property Rights (IPR), mitigate this effect. The study contributes to digital globalization theory and the new Ownership, Location, and Internalization (OLI) framework, offering insights for policymakers and firms in traditional industries like TCM to enhance internationalization through digitalization.

Keywords: Digitalization transformation, Innovation, Internationalization, Traditional Chinese Medicine (TCM), new OLI advantages

Introduction

Digitalization has had a profound impact on the globalization of firms, challenging many traditional international business (IB) theories. Luo (2021) argues that Ownership, Location, and Internalization (OLI) advantages, central to the eclectic paradigm, have diminished in relevance in the digital era. Similarly, Drori, Alessandri, Bart, and Herstein (2023) suggest that digitalization can mitigate market

imperfections and ease location-specific constraints tied to firm-specific advantages (FSAs). Feliciano-Cestero, Ameen, Kotabe, Paul, and Signoret (2023) view digitalization as a "double-edged sword" in internationalization, bringing both opportunities and challenges, and call for further research on the digital transformation-internationalization link. This study focuses on the internationalization of Traditional Chinese Medicine (TCM) firms, a key part of China's globalization efforts. TCM, with its 3000-year history, has gained global recognition for its role in healthcare (Che, George, Ijindu, Pushpangadan, & Andrae-Marobela, 2024), particularly in contributing to Sustainable Development Goal 3 of the United Nations (Wang, Xing, Zhang, & Liu, 2022). Recent advancements in digitalization have modernized TCM, expanding services and raising clinical care standards. However, IB and strategic management research has given limited attention to China's Outward Foreign Direct Investment (OFDI) in TCM (Blomkvist & Drogendijk, 2016), even as TCM gains legitimacy globally, supported by organizations like the WHO, especially during the COVID-19 pandemic. Given TCM's increasing digitalization, innovation, and globalization, it is crucial to explore how current IB theories apply to this evolving industry.

Literature and framework

The complex relationship between digital transformation and innovation calls for further research to better understand its implications for organizations (Appio, Frattini, Petruzzelli, & Neirotti, 2021). Many studies highlight the positive impact of digitalization on innovation, with Li, Gao, Han, Gupta, Alhalabi, and Almakdi (2023) showing that both firm-level digitalization and regional digital industry development boost innovation. TCM firms, facing competition from Western medicine, are under pressure to innovate. Digitalization offers them opportunities to enhance their innovation capabilities through new technologies, supported by favorable government policies promoting digitalization. Based

on this rationale, we propose the following hypothesis:

H1: There is a significant positive relationship between digital transformation and innovation performance in Chinese TCM firms.

Recent research has focused on how digital transformation affects enterprise internationalization, though the field is still developing (Bergamaschi, Bettinelli, Lissana, & Picone, 2021). While some studies show mixed results (Bhandari, Zámorský, Ranta, & Salo, 2023), digitalization is known to reduce transaction costs and facilitate cross-border operations (Drori, Alessandri, Bart, & Herstein, 2023), improve market access, and enhance communication (Pereira, Durão, Moreira, & Veloso, 2022). Existing studies provide evidence that digitalization drives OFDI in Chinese firms through productivity increases, reduced financing constraints, and improved efficiency. Therefore, we propose:

H2: There is a significant positive relationship between digital transformation and the degree of internationalization in Chinese TCM firms.

Zheng and Sun (2022) demonstrated that digital ownership advantages enhance firm internationalization, especially in early stages, while innovation plays an indirect role as firms expand. The interaction between digitalization and innovation is crucial for understanding how firms leverage digital capabilities to navigate international markets. Firms that innovate in response to international market demands are better positioned to succeed globally, especially with digital technologies facilitating this process. We propose:

H3: The interaction between digital transformation and innovation has a significant positive impact on the degree of internationalization.

The impact of digital transformation and innovation on internationalization is likely stronger in regions with higher openness, as increased competition and integration push firms to adopt new technologies and innovate. IFDI facilitates knowledge and technology transfer, further strengthening this relationship. Additionally, strong IPR encourage firms to innovate and invest in digital technologies, making them

more competitive internationally. We propose:

H4: Local openness significantly moderates the relationship between the interaction of digital transformation and innovation on internationalization.

H5: Local IFDI levels significantly moderate the relationship between the interaction of digital transformation and innovation on internationalization.

H6: Local IPR levels significantly moderate the relationship between the interaction of digital transformation and innovation on internationalization.

Data and Method

Our sample comprised 72 TCM companies listed on China's A-share market, identified using Wind Database and verified through sources like Sina Finance. We adopted fixed-effects regression and semi-structured interviews. Enterprise data are sourced from CSMAR and China Statistical Yearbook. We followed the measurement of degree of internationalization (DoI) with the “ratio of foreign revenue to firms’ total revenue” following a recent study (Bhandari, Zámorský, Ranta, & Salo, 2023), which also investigated digitalization and internationalization while with US sample. This measurement is a classic, widely adopted measurement of DoI (Abdi & Aulakh, 2018). We measured enterprise innovation total patent applications plus one, followed by logarithm, which is the most widely adopted measure for measuring firm innovation performance (Su & Li, 2021). We measured firms’ digitalization with the CSMAR’s Digital Transformation Index. Following previous literature, for moderators, openness was measured as the ratio of total merchandise trade (imports and exports) to GDP. IFDI was calculated as the ratio of inward FDI to provincial GDP. IPR was measured by the intensity of intellectual property protection using the ratio of technology market transactions to GDP. The model controls for firm-specific variables such as age, size, leverage, return on assets, fixed assets, growth, board structure, independence, dual leadership, and state ownership.

Results and Discussion

Contrary to the expectations, results of Hypothesis 1 show a significant negative (-0.0144, $p < 0.01$)

relationship between digitalization and innovation, which identifies an opposite conclusion from previous literature showing evidence of positive effects. This hindering effect raises our attention to the “dark side of digitalization”, which was described as “a higher level of question in researching digitalization and IB”(Meyer, Li, Brouthers, & Jean, 2023). Specifically, the TCM industry faces unique challenges, such as complex formulae and diagnostic methods, making digitalization more costly and time-consuming compared to other sectors (Huang, Yan, & Hu, 2018, Litscher, 2023). The evidence calls for targeted strategies to address these challenges and enable TCM firms to benefit more from digitalization. Hypothesis 2 is supported, showing a positive relationship between digitalization and internationalization (0.0014, $p < 0.01$). Thus, it is empirically suggested that the higher the level of digitalization a TCM company is, the higher the degree of internationalization the firm becomes. Digitalization enables TCM firms to better communicate with international partners, access global market data, and develop efficient supply chains, which in turn enhances their international competitiveness. Results for Hypothesis 3, however, reveal a negative interaction between digitalization and innovation on internationalization (-0.0023, $p < 0.01$). This suggests that while digitalization alone promotes internationalization, integrating innovation with digitalization may hinder global expansion. Moderating effects for Hypothesis 4-6 demonstrate that local openness, IFDI, and IPR significantly positively influence the relationship between digitalization, innovation, and internationalization. Regions with higher openness, IFDI, and stronger IPR protection mitigate the negative interaction between digitalization and innovation, fostering international expansion. These findings highlight the importance of local environmental factors in shaping the international success of TCM firms in the digital era.

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MS0152: Evasion or Compliance? The Impact of Extradition Treaties on International Investment Location Choices

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Evasion or Compliance? The Impact of Extradition Treaties on International Investment

Location Choices

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Abstract

Considering the impact of time length and shock events, we replicate and extend Hu and colleagues' work (Journal of World Business 59: 101542, 2024), which hypothesized that the existent of extradition treaties between home and host countries decreased the likelihood of extending international business in focal country, as tested with a sample of 761 Chinese firms in 106 foreign

countries during 2001–2013. Given the stage of opening up policy has been changed greatly after the releasing of the Belt and Road Initiative and international tendency has changed a lot due to various political and economic events, we ask the question of whether the effects in Hu et al. (2024) can be tested over a longer time cover the new developing stage. We examine the generalizability of their findings (1) by replicating their study with the sample from the same data source over a longer period (2001–2022), (2) by introducing the Chinese mutual harm as an additional moderator, and (3) by introducing the Anticorruption Supervision and the “Administrative Measures for Overseas Investments by Enterprises” (NDRC Order No. 11 of 2017) as additional policy variables. We find a positive impact of extradition treaties on corporate overseas investment location choice after extending the time span to 2022, and this relationship is positively moderated by the Chinese mutual harm events. Further, we find that the positive relationship is stronger for SOE than POE after the anticorruption supervision and weaker when the home country strengthens regulating on foreign subsidiaries.

Keyword: Extradition Treaties, FDI Location Choice, Role of Time, Shock events, Replications

Introduction

FDI location choice has been a key research question in international business studies for a long time (Iriyama, Li, & Madhavan, 2010; Kulchina, 2016; Lu, Liu, Wright, & Filatotchev, 2014; Nielsen, Asmussen, & Weatherall, 2017). Investing in a country that has a stable institutional environment, promising markets, or valuable natural resources could bring the corporation lots of opportunities to expand its business (Mathews & Zander, 2007; Zaheer, 1995). Previous studies on FDI location choosing usually focus on distance like The Uppsala Model (Forsgren, 2002; Johnson & Vahlne, 2009;

1977), the favorable policy of home countries like the Belt and Road initiative (Du & Zhang, 2018) and the bilateral relationship which contained the factors of host countries inside (Li, Meyer, Zhang, & Ding, 2018; Obadia & Robson, 2021).

Researchers who paid attention to the bilateral relationship have conducted a series of research around its effects on the location choices of MNEs. Li and colleagues (2017) have improved good diplomatic relations induce firms to invest in focal host countries. The support to host countries due to good diplomatic relations could also stimulate the expansion of companies from home countries (Shapiro, Vecino, & Li, 2017). But most of them tested the positive effects of the policies or the cooperation of countries while neglecting the dark side of them. When some policies bringing conveniences to both countries in fields like judicature or other non-economic ones, they would also do harm to the business (Ghemawat, 2003; Tang, Shu & Zhou, 2021). Therefore, paying attention to the dark side of a policy (like Extradition treaties) when considering its effect on business could be vital important.

Extradition treaties, as formal legal agreements, enable both-sides to surrender individuals who have been accused or convicted of a crime to stand trial or serve a sentence in the requesting country (Bassiouni, 2014), were so common in Western developed countries and have been increasingly signed by developing countries in recent years (Efrat & Newman, 2020; Hu, Yu, & Delios, 2024). It played an important role in exercising their jurisdiction and law enforcement in international territories and establishing mutual trust (Kuhn, 1937; Hu et al., 2024), which would also promote economic communication. But few studies explore the possibility that it may eliminate the international expansion of MNEs in emerging economies due to the extension of home countries' law (Luo & Tung, 2007; Tang et al., 2021). So, corporate managers may not choose the countries having extradition

treaties with home countries to invest, considering the possibility of being extradited back.

Related to the above, Hu and colleagues (2024; henceforth HYD) examined how corporates' choices on host country would be impacted by the extradition treaties between the home and focal host country and confirmed the negative relationship between them, based on the idea that extradition treaties increase the risk being extradited if firms violate laws in either country or in the other words, constraining the opportunities to manipulate (Tang et al, 2021). In our research, we ask several pivotal counter questions to their analysis: First, whether the extradition treaty could reduce the possibility of foreign investment in focal host countries. To examine this question, we employ a narrow replication of the benchmark study of HYD with the same identification strategy, followed by a time extension to 2022, as we consider how dynamic changes of FDI tendency worldwide could redefine the underlying logic of corporate overseas investment. Time generalization enables us to investigate whether the findings of HYD are period-specific. In our replication, we identify the positive impact of extradition treaties on corporate overseas investment location choice, which indicates that the underlying logic of corporate FDI location choice emphasized by HYD changes after the time expansion.

Second, concerning the decreasing perceived safety of Chinese expatriates in the era of misanthropy towards to Chinese, which may accelerate the turnover rates of talents and dampen the operating efficiency overseas, firms have to balance the compliance costs demonstrated by HYD with the personal safety protection from the extradition treaties. Recently, there has been a tendency that the decreasing perceptive security of Chinese employees is induced by many vicious crimes aimed at the Chinese and conducted by compatriots. Comparing with terrorist attacks, natural disasters, extradition treaties mainly protect overseas employees from criminals conducted by Chinese compatriots. For example, on June 24, 2024, a Chinese businessman citizen and a Chinese American who planned to

invest in the Philippines were kidnapped and killed by a Chinese woman and local criminals, which caused huge panic among Chinese merchants seeking overseas investment. In this case, extradition treaties endow Chinese regulators with the right to request host countries to extradite suspects with Chinese citizenship instead of host countries' suspects. To investigate the impact of extradition treaties on deterring compatriot criminals, we manually collect data from the GDELT database including worldwide news from 1971 and then impute the quantity of criminal cases towards Chinese implemented by Chinese as the proxy of Chinese mutual harm. We find that firms are more likely to invest in countries with higher rates of Chinese mutual harm before the extradition treaties signing, which suggests that extradition treaties accelerate corporate FDI by awing compatriot crimes.

Third, HYD pointed out that SOE executives treat overseas investment as the opportunity to engage in asset tunneling. Thus, they also have the motivation to circumvent extradition treaties, albeit with a weaker effect compared to POEs. On the one hand, this tendency can be eliminated after China's anticorruption campaign in 2012, which enhanced the monitoring and limited the possibility of gaining private benefits at the cost of public interests (Pan & Tian, 2020). On the other hand, compared with the increasing risks of benefit transfer in domestic, overseas investment is less likely to be detected. So, the tendency of SOE managers to escape from the host country that has established an extradition treaty with China may be more intense. To investigate this problem, we conduct the staggered DID tests using the staggered investigations as the exogenous shocks. We find that the positive relationship between extradition treaties and Chinese firms' FDI entry propensity is stronger for SOE than POE after the staggered anticorruption supervision, which suggests that by reducing private interest seeking, SOE executives change their motivation of overseas investment location from circumventing extradition treaties to behave consistently with the central government's foreign policy.

Last, as the escape strategy based on the logic to avoid the extension of home countries' regulation (Hu et al., 2024), this incentive reduces when the home country tightens domestic supervision on overseas investment in other ways. To investigate this problem, we employ a DID identification strategy using NDRC Order No. 11 of 2017 as the exogenous shock. On December 26, 2017, the National Development and Reform Commission (NDRC) issued the "Administrative Measures for Overseas Investments by Enterprises" (NDRC Order No. 11 of 2017), which urges firms owning overseas investment to report dynamics of foreign investment and enables Chinese domestic regulatory authorities to monitor foreign investment directly. Our results imply that as the home country strengthens regulating on all foreign subsidiaries, utilizing the escape strategy in response to collaborate on cross-border law enforcement is less valuable.

Our results make three contributions. First, we provide some distinctive findings, suggesting that the arguments of Hu et al. (2024) are time- and context-sensitive. As an extension of Hu et al. (2024), we offer a comprehensive view of the relationship between extradition treaty and corporate foreign investment location choice by providing evidence that the motivation of corporate FDI in response to extradition treaties changed and manifesting the underlying mechanisms behind this relationship. Second, we highlight the moderating effect of the anticorruption campaign by revealing changes in SOEs' behavior before and after the campaign. This finding emphasizes both the positive effects of policy and the importance of shock events. Third, our combination of a narrow replication and a quasi-replication hence contributes to the discussion on how replication can help us understand the universality of empirical relationships while exploring the underlying mechanisms (Howard, Withers, Carnes, & Hillman, 2016; Tsang & Kwan, 1999).

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MS0153: Localization Effectiveness in Africa for China's Belt and Road Initiative

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Localization Effectiveness in Africa for China's Belt and Road Initiative

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Introduction

The BRI (China's '*Belt and Road Initiative*' or 一带一路) was initially about large infrastructure projects, including energy development before the Covid-19 crisis. Post Covid-19, and due to financial and politically contingent reasons, it has changed its focus more to remote digital investments (Jiang, 2024). If one considers a map, the BRI is largely committed to projects in developing Africa, with billions of US dollars in investment. China still has considerable energy and infrastructure investments in oil projects in Angola, and Sudan; mining projects in Congo (Bloomberg, 2021) and Ghana; infrastructure projects in Kenya, Tanzania, and Ethiopia, such as ports, roads, and hydropower dams. Unfortunately, Africa has a dearth of talent and needs localized talent development and human resource development solutions (Sachs, 2010; Moyo, 2012).

In short, there is a strong need to '*localize the workforce*' (Hickey, 2017) in these countries to do these technical jobs over time. Localization is not just about 'hard skills' such as engineering, IT, and accounting, but also about the soft skills of leadership, organization, communication, delegation, marketing, training, and human resources that are needed among the technicians and operators of these projects. For long term political stability, all projects need to localize. Already there is political tension on BRI projects that have not significantly localized: such as in Angola, S. Sudan, and Madagascar. Local people do not believe that the jobs created have benefitted them as much as Chinese workers and technicians, and don't see this trend stopping. The result has been riots, property

destruction, and suspended projects. Some African countries have now expressed BRI dissatisfaction due to a lack of local jobs .

Literature Review and Conceptual Framework

A good way to show localization of these jobs is to create local managers, supervisors, and operators (Hatakenaka, et al. 2006). This then becomes very visible to people in that country as engagement, and instead of opposing the investment will welcome it in the long term, as the success of the project visibly benefits them and their communities directly (Hickey, 2017).

Unfortunately, many of these projects are decided and commissioned by engineers and accountants from Beijing, Qingdao, and Shanghai, who are not well versed in working with foreign peoples, cultures, management styles, etc. and may have an ethnocentric viewpoint (Pegg, 2010). This will create communication gaps. While they may be good project managers in China and understand how hiring, operations, and administration work in Nanjing, Gansu, or Kunming, for example, they are poorly or not at all trained to work with local people in Africa in mentoring, hybrid learning or apprenticeship type settings. In short, the 'human dimension' then fails in Africa as there is no real skill transfer except for (well publicized) low level jobs (cleaners, cooks, box-loaders, truck drivers, etc). Economic activity does not filter down well. Local people in these countries only see foreign managers, technicians, engineers, and their contractors coming to do the work. The locals are left largely out of the real jobs picture. However, China cannot staff these projects into perpetuity, eventually, they will have to transfer operations over to locals (Brautigam, 2009). But by that time, the project may have failed, been nationalized, or be severely underutilized. Overall, long term investment stability is compromised. Essentially, if local people are not significantly involved in the project early on, it will always be considered a 'China Project' no matter how much it benefits them, but if given real careers the entire viewpoint changes, from unwelcome or tacit acceptance, to embracing the project outright (Calabrese, 2019) .

Methods

There are already many Chinese SOE's (State Owned Enterprises) such as Sinopec, Petrochina, CNOOC, CCCC, State Grid, and Henan Power, that do in fact, send select star locals from developing countries to schools such as RenDa (Beijing), ZheDa (Hangzhou), and ShiDa (Shandong) for advanced infrastructure technical training, but this is on a select basis only (Yojana, S. 2015), is not an open process to scale, but more based on the 'guanxi' the manager has with those schools (and other schools in China), and is not formalized or structured to create a consistent development system, that can train many people on a large scale (Bardhan, 1997)

This paper compares and contrasts those China SOE's which have the most to gain and lose with their projects in Africa *in situ* and considers the effectiveness of their formalized training and development for African talent in those countries where they have projects (Gao, 1997; Tull, 2006). A further comparison is utilized in that many large oil and mining companies from the US and EU (Shell, Exxon, Rio Tinto, Anglo-American) employ these methods operating in Africa using various workforce comparator tools and standardized management development practices (Grogan, 2010).

Discussion

Since many African countries are technically bankrupt (ISSAFRICA 2020), they simply cannot fund their best students for study, this is left to the international oil and mining investors to do which includes SOE's on the Chinese BRI. The Chinese SOE's however, as an extension of the Chinese government, can provide the financial presence to develop these local Africans. In other words, China has a long term interest in ensuring the development of localized managers to work for their SOE's for BRI project viability and stability (China Africa Research Initiative, 2018). How this all will play out is unclear at this point.

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MS0154: A Study on Dynamic Stakeholder Management for International Project Contracting

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A study on dynamic stakeholder management for international project contracting

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Abstract: International project contracting is a key mode for Chinese business to enter the global markets and it imposes a unique requirement upon the project companies regarding project management for their stakeholders as it has become a trend in international project management practice which traditionally regards cost, time and quality as its triangle base. International project contracting is a unique business, which contains particular features regarding its processes and management requirements. Through literature reviews for stakeholder theories, the author attempts to explore the management mechanism in the international project contracting context and points out that due to the pitfalls of current stakeholder theories, the management of international project should have to carefully identify their stakeholders in their very projects and carry out pertinent management for their stakeholders dynamically.

Key words: international project contracting; stakeholders; stakeholder management

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Dr Huang is also an experienced practitioner in international project contracting management. He used to participate in construction of various international projects for more than 5 years in Pakistan and Nepal, where he served as professional interpreter, procurement manager and project manager.

Dr Huang's research interests lie in International Business Management, Economics and Corporate Sustainability. Focusing upon these fields, his academic papers and works have been published in a wide range of national and international journals and

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国际工程承包项目利益相关者动态管理策略研究

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摘 要：国际工程承包在我国对外经济活动中发挥着积极而重要的作用，其发展前景也非常广阔。国际项目管理水平是项目成败的关键。当前，国际上项目管理已经从传统的侧重于成本、进度和质量三方面控制的项目管理模式跨入利益相关者管理模式的阶段，对国际项目管理者提出了新的挑战。本文回顾了利益相关者的理论发展和相关文献，对国际项目的利益相关者的管理问题进行了探索。指出，与其他类型项目建设相比，国际项目的流程、管理方式和特点都非常突出，尤其是项目实施的不同阶段，所涉及的利益相关者都不一样，管理者应该根据不同的项目及其实施阶段识别利益相关者，对之进行动态管理。

关键词：国际工程承包；利益相关者；利益相关者管理策略；

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MS0155: Global Value Chains and Innovation: An Exploratory Cross-country Cross-industry Study

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Global Value Chains and Innovation: An Exploratory Cross-country Cross-industry Study

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Global Value Chains and Innovation: An Exploratory Cross-country Cross-industry Study

Abstract: Global value chains (GVCs) are long assumed to benefit innovation, and vice versa. However, the literature has yet to paint a clear picture of how innovation capabilities of different industries in different countries have changed along with GVC expansion across the world or vice versa. To fill the gap, this study focuses on the phenomenon that industries participate in GVCs in two modes—backward participation and forward participation, positing that the two modes differentially affect an industry’s innovation capability and that the effects are bound by industry- and home country-specificities. We also propose that an industry’s innovation capability affects the two modes differentially and that the effects are contingent upon industry- and home country-specificities. We tested our hypotheses on a sample of all manufacturing industries across 76 economies participating in GVCs over 1995-2017. Our results show that an industry’s backward participation (importing foreign intermediate goods to produce its export) has an inverted U-shaped impact on its innovation capability, whereas forward participation (exporting domestically fabricated intermediates for foreign countries to produce their exports) has a U-shaped effect. These effects are stronger in concentrated industries and emerging economies. Our results do not show a robust effect of an industry’s innovation capability on two GVC participation modes. Our study contributes to the intersection of GVC, trade and innovation literature by revealing the complex relationship between GVC trade and innovation and its boundary conditions.

Keywords: Global value chain (GVC); Innovation; Trade; Manufacturing industries; Panel data analysis

Introduction

The rapid expansion of GVCs has drawn increasing scholarly attention from diverse disciplines (Kano, Tsang, & Yeung, 2020). Defined differently, a GVC in general refers to geographically dispersed, organizationally fragmented, yet functionally integrated form of production orchestrated mostly by advanced economy multinationals (AMNEs) (Kano, Tsang, & Yeung, 2020). GVC trade is exports and imports of intermediate goods and services across multiple national borders, distinct from traditional trade

that is transactions of final goods and services just between one exporting country and one importing country. GVC trade has grown to more than 45% of the world trade since 2000, and all countries have participated in GVCs to different extent (World Bank, 2020). Countries in North America, Western Europe and East Asia engage in complex GVCs producing advanced and innovative manufactures and services, whereas those in other territories produce either limited manufactures or commodities further processed in and exported by other countries (World Bank, 2020).

GVCs by nature propel knowledge and organizational connectedness, providing fertile ground for innovation (Cano-Kollmann et al., 2016; Turkina & Van Assche, 2018). However, the literature has yet to offer a clear answer how GVC activities impact innovation and vice versa (Ambos et al., 2021). GVC studies have examined the upgrading of emerging economies by partaking in GVCs (e.g., Gereffi, 2018; Gereffi, Humphrey, & Sturgeon, 2005), but used the concept of upgrading as both a synonym for innovation and the outcome of innovation (De Marchi et al., 2020; Morrison, Pietrobelli, & Rabellotti, 2008), rarely systematically testing the impact of GVC activities on innovation (Ambos et al., 2021; De Marchi et al., 2020; Lee & Gereffi, 2021; Van Assche, 2017). Only until recently a handful of scholars argue that upgrading does not necessarily concur with or lead to innovations (Buciuni & Pisano, 2021). A few others empirically explore the innovation development of one or two industries in emerging economies (Horner, 2022; Lema, Quadros, & Schmitz, 2015), identifying that the industries do not necessarily become innovative via partaking in GVC. Lema et al. (2021) also find that the uneven innovation capability development exists within one industry (information technology) due to cross-country variations in the industry's GVC participation extent and the local sectoral innovation system the industry embedded in.

Beyond the above studies, there yet to be large-scale longitudinal cross-country cross-industry tests on how GVC participation impacts innovation or vice versa. Furthermore, scholars have yet to differentiate the two participation modes that entail high heterogeneity across industries, countries and time (see an illustration in Figure 1). It is theoretically important to explore how GVC participation

modes impact innovation across industries, countries, and time, and vice versa. A GVC differs from the previously studied innovation contexts (e.g., home country only, traditional trade, foreign direct investment, R&D internationalization), primarily due to its multilevel organizational and institutional complexities (Kano, Tsang, & Yeung, 2020). These complexities exert not only multifaceted direct impact on participants' innovation activities but also joint impact with the contextual specificities in which the participants are embedded. An empirical investigation into this direction will not only enrich the GVC and innovation research with systematic evidence, but also help reconcile the longstanding debates about the effects of offshoring, outsourcing, FDI, and export on innovation (De Marchi et al., 2020; Kano, Tsang, & Yeung, 2020; Lema et al., 2021).

Theoretical Background and Hypothesis Development

Against this background, this study systematically explores the relationships between two GVC participation modes and innovation. We posit that the two GVC participation modes form two different inter-firm relational contexts for local participating firms' innovation, primarily because the two modes entail different power asymmetries between local and foreign firms and impose different requirements on local firms' pre-entry capabilities. Backward GVC participation—importing foreign intermediate goods to produce its export—forms a foreign producer-driven innovation context, in which local firms' learning and innovation processes are constrained by the accessibility, transferability, and appropriability of the foreign producers' knowledge and technologies entailed in intermediate products (e.g., high tacitness, high cumulateness, low modularity, frequent generational technology change) (Malerba, 2002). Local firms of an industry embedded mainly in backward GVC participation will first increase and then decrease its innovation capabilities. The nature of forward GVC participation—exporting domestically fabricated intermediates for foreign countries to produce their exports—determines it to be a local firm-driven innovation context that requires a higher level of local firms' pre-entry capabilities than backward participation. Engaging in this mode, local firms can learn from the export market (Lipparini, Lorenzoni,

& Ferriani, 2014; Salomon & Shaver, 2005) and co-evolve with it (Lema et al., 2021; Malerba, 2002), thereby improving their innovation capability over time.

Meanwhile, the relationships between two modes and innovation are subject to industry characteristics and the industry's home country economic development. The global competition structure of an industry determines the opportunities and appropriability of innovation within the industry. Therefore, the GVC participation-innovation relationships will be stronger in concentrated industries. Knowledge competition intensity of an industry, i.e., the R&D investment intensity, also influence pressures, opportunities and profitability of innovation. Therefore, the GVC participation-innovation relationships will be stronger in technologically intensive industries. Home country's economic development influences innovation system building (Lundvall, 1992; Malerba, 2002). Emerging economies have weaker innovation systems than advanced economies, thus the GVC participation-innovation relationships will be more evident in them.

Methods and Results

We tested our hypotheses with a dataset of 23 manufacturing industries across 76 major economies participating in GVC trade over 1995-2017. We collected GVC trade data of worldwide manufacturing industries over 1995-2017 from OECD's trade in value-added (TiVA) database (2023 version), invention patents granted by US Patent and Trademark Office (USPTO) to worldwide applicants over 1987-2017 from the worldwide patent database PATSTAT (2018 spring version), and data on industry- and national-level control variables (R&D investment, FDI net flow, export, etc.) from OECD, World Bank and International Monetary Fund (IMF). As the source databases use different industry classifications and span different periods, we mapped and cleaned data through multiple iterative steps, finally retaining an unbalanced panel of 54,188 observations over 1995-2017.

We used a fix-effect model to test hypotheses. To avoid simultaneity bias, we regressed 1-year to 4-year lagged dependent variable respectively on predictors. We also ran additional U tests (Haans,

Pieters, & He, 2016) and calculated marginal effects of the hypothesized curvilinear effect. To test moderation effects, we performed respective sub-group analyses.

Theoretical Contribution

Our study offers the first systematic assessment of the relationship between GVC activities and innovation capability across industries, countries and time. It reveals that two GVC participation modes function as two different innovation contexts, leading to different innovation outcomes. This insight identifies another factor influential to learning mechanisms and outcomes in GVCs—GVC participation mode, aside from GVC governance (Gereffi, Humphrey, & Sturgeon, 2005; Humphrey & Schmitz, 2002) and GVC structure (Buciuni & Pisano, 2021). Additionally, our study points out industry- and country-level contingencies on the GVC participation-innovation relation, enriching the knowledge about environmental complexity and contextuality in IB and innovation (Pedersen, Larsen, & Dasí, 2020).

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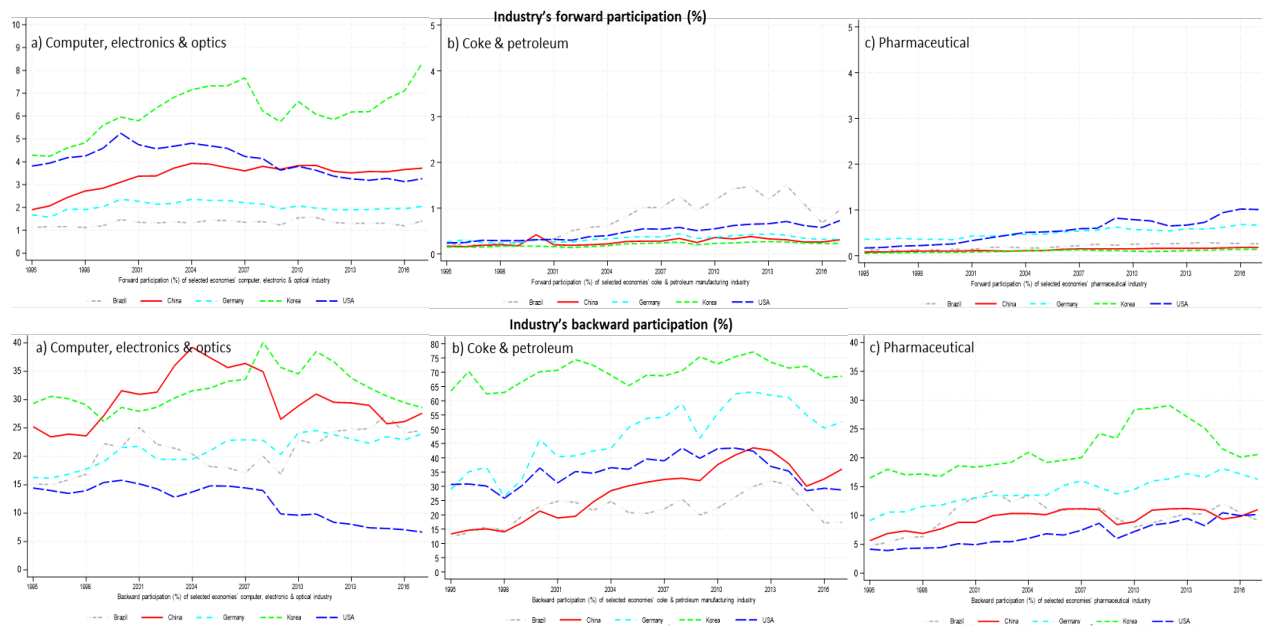
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Figure 1. Two GVC participation modes of three industries across five countries



Note: The figures use different scales of y axis to show curves more clearly. The three industries are (a) computer, electronics and optics product manufacturing (high-tech), coke and refined petroleum product manufacturing (low-tech), and pharmaceutical manufacturing (high-tech). The upper three figures show their forward participation extent, and the lower three are their backward participation extent. The countries are Brazil (gray dash line), China (red line), Germany (light blue dash line), South Korea (green dash line), and USA (dark blue dash line).

Data source: authors' calculation.



MS0156: Compositions and Contexts for Going Green: A Multi-level Contingency Model of Gender-diverse Boards and Environmental Innovation in East Asian Corporations

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COMPOSITIONS AND CONTEXTS FOR GOING GREEN: A MULTI-LEVEL CONTINGENCY MODEL OF GENDER-DIVERSE BOARDS AND ENVIRONMENTAL INNOVATION IN EAST ASIAN CORPORATIONS

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EXTENDED ABSTRACT

This study examines the relationship between board gender diversity and environmental innovation in East Asian firms. Analyzing data from 81 Korean and 234 Japanese firms over 2007-2020, the study reveals that the impact of board gender diversity on environmental innovation is not direct but contingent on several factors. Strong sustainability governance and ethical climate positively moderate this relationship, enhancing the positive effect of gender diversity on environmental innovation. These moderating effects are further amplified in industries with higher carbon intensity, suggesting that the salience of environmental issues in these sectors creates opportunities for women directors to influence environmental strategies.

Keywords: Board gender diversity, environmental innovation, East Asian firms

INTRODUCTION

Corporations play a critical role in addressing climate change through environmental innovation, which includes developing products, processes, or ideas to reduce environmental impact (Horbach, 2008; van den Bergh et al., 2011). Although these innovations offer competitive advantages (Chang & Sam, 2015; Forsman, 2013), firms face technological, regulatory, and stakeholder challenges. The composition of corporate boards, particularly gender diversity, becomes essential here. Board gender diversity has been associated with positive outcomes, such as better financial performance (Post & Byron, 2015), corporate social responsibility (Bear et al., 2010), and innovation (Miller & Triana, 2009). However, women directors often face challenges that affect their capacity to advocate for sustainability initiatives. Using tokenism theory (Kanter, 1977) and threat rigidity (Staw et al., 1981), we propose a framework exploring how organizational and contextual factors moderate these dynamics. Our analysis of 81 Korean

and 234 Japanese firms shows that board gender diversity positively affects environmental innovation, especially in firms with strong sustainability governance and ethical climates.

THEORY AND HYPOTHESES

Challenges of Women Directors in East Asia

Women directors in East Asia encounter two primary challenges: tokenism and societal expectations. Tokenism (Kanter, 1977) arises when women, as a minority, experience heightened visibility and pressure to conform, limiting their contributions. Societal expectations further isolate women, making it harder to advocate for change. These challenges often lead to rigid responses, such as self-censorship (Staw et al., 1981), which hinder their influence on sustainability initiatives. However, under certain conditions, women directors may strategically use stereotypes to champion environmental initiatives. Organizational factors such as corporate governance and climate can either reinforce or alleviate this rigidity, enabling women directors to influence environmental innovation when conditions are favorable.

Organizational Contingencies: Corporate Sustainability Governance

Corporate sustainability governance plays a crucial role in mitigating the rigid responses of token women directors. Strong governance structures, such as sustainability committees, can reduce perceived threats, enabling women to express their perspectives and influence environmental innovation. These structures serve as a "structural critical mass" that amplifies women's influence, even on boards with a low number of women. Conversely, weak governance can reinforce tokenism and limit their ability to advocate for sustainability.

Hypothesis 1: The positive relationship between board gender diversity and environmental innovation is stronger when corporate sustainability governance is stronger.

Organizational Contingencies: Ethical Climate

A strong ethical climate fosters an environment where women directors can voice their opinions without fear of marginalization. It encourages diverse perspectives and supports women in promoting environmental innovation. In contrast, weak ethical climates may reinforce rigid behaviors and limit women directors' contributions.

***Hypothesis 2:** The positive relationship between board gender diversity and environmental innovation is stronger when the firm's ethical climate is stronger.*

Industry Contingencies: Industry Carbon Intensity

In high carbon-intensity industries, environmental challenges are more urgent, which can intensify threat rigidity, making women directors hesitant to push for environmental innovation. However, strong sustainability governance and ethical climates can reduce these perceived threats, enabling women to leverage their environmental orientation. The combination of strong governance and ethical climates provides opportunities for women directors to overcome tokenism and contribute to environmental innovation in carbon-intensive industries.

***Hypothesis 3:** Corporate sustainability governance's moderating effect on board gender diversity and environmental innovation is more pronounced in high carbon-intensity industries.*

***Hypothesis 4:** The ethical climate's moderating effect on board gender diversity and environmental innovation is more pronounced in high carbon-intensity industries.*

METHODS

Data and Sample

We used the *Thomson Reuters Refinitiv* (now LSEG) database for ESG data on over 10,000 companies, supplemented with *Compustat Global* for financial indicators and the *World Bank* for country-level data. Focusing on consumer discretionary, consumer staples, and industrial sectors, we constructed a sample of 81 Korean and 234 Japanese firms (2007-2020), resulting in 3,186 firm-year observations. This multi-source dataset enabled the analysis of ESG trends, corporate governance, and performance metrics.

Measurement

Dependent variable: Environmental innovation, is measured using a comprehensive score from the Refinitiv dataset, which is based on metrics from sources such as annual reports and sustainability filings. This score reflects a firm's capacity to reduce environmental costs while creating new market opportunities through the development of eco-friendly technologies and products. It includes dimensions like product innovation, green revenues, R&D efforts in environmental innovation, and capital expenditures on clean technologies or energy-efficient processes. Overall, the score provides a holistic view of a firm's commitment to environmental innovation.

Independent variable: Our primary independent variable, board gender diversity, is constructed using data from the *Refinitiv* dataset. We operationalize board gender diversity as the percentage of female directors on the board for each firm-year observation

Moderating variables: The first firm-level moderating variable is sustainability governance, which measures a firm's commitment to corporate social responsibility (CSR) and sustainability. This composite variable, derived from the *Refinitiv* dataset, includes indicators such as the presence of a CSR board committee, the publication of standalone sustainability reports, and the integration of sustainability topics in management discussions.

The second firm-level moderating variable is the ethical climate, focused specifically on anti-corruption efforts. This variable, also from the *Refinitiv* dataset, is operationalized by whether the firm has provisions in its code of conduct to prevent bribery and corruption. This binary indicator (1 if such provisions exist, 0 otherwise) serves as a proxy for the firm's commitment to ethical business practices.

The industry-level moderating variable, industry carbon intensity, measures the average CO2 equivalent emissions for each 4-digit Standard Industrial Classification (SIC) sector. This variable, sourced from the *Refinitiv* dataset, captures the average carbon footprint of firms within specific industry segments.

Statistical Approach

To test our hypotheses, we employed firm fixed-effects linear regression models. Fixed-effects models allow us to account for unobserved heterogeneity in firms that may simultaneously predict firms' environmental innovation score and board gender diversity. Fixed-effects models are particularly suitable for analyzing within-firm variations over time, which is crucial given the panel structure of our data. We confirmed the suitability of employing the fixed-effects model over the random-effects model using the Hausman test.

RESULTS

The results confirm our hypotheses, showing strong support for the proposed relationships between board gender diversity, sustainability governance, ethical climate, and environmental innovation.

Table 1. Fixed-Effects Linear Regression Models Predicting Environmental Innovation Scores

	Environmental innovation			
	Model 1	Model 2	Model 3	Model 4
Board gender diversity		-0.024 (0.093)	-0.347* (0.145)	-0.468*** (0.119)
Board gender diversity X Sustainability orientation (H1)			0.007** (0.002)	
Board gender diversity X Ethical climate (H2)				0.771*** (0.132)
Sustainability orientation	0.104*** (0.019)	0.104*** (0.019)	0.086*** (0.020)	0.107*** (0.019)
Ethical climate	1.744 (1.090)	1.749 (1.090)	1.722 (1.089)	-0.554 (1.153)
Industry carbon intensity	0.350 (0.602)	0.345 (0.602)	0.344 (0.601)	0.351 (0.599)
	Control variables included			
Year fixed-effects	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes
Constant	-67.095 (97.903)	-66.260 (97.972)	-67.924 (97.847)	-70.946 (97.408)
Observations	3186	3186	3186	3186
Within R-square	0.133	0.133	0.135	0.143
F-statistics	18.157	17.427	17.122	18.271

+ p<0.10 * p<0.05 ** p<0.01 *** p<0.001

Table 2. Subsample Analysis by Industry Carbon Intensity

	Environmental innovation scores			
	Industry carbon intensity		Industry carbon intensity	
	High	Low	High	Low
	Model 5	Model 6	Model 7	Model 8
Board gender diversity	-0.777*** (0.228)	-0.008 (0.194)	-0.420* (0.195)	-0.320* (0.158)
Board gender diversity X Sustainability orientation (H3)	0.014*** (0.004)	-0.002 (0.003)		

Board gender diversity X Ethical climate (H4)			0.567*	0.446*
			(0.222)	(0.201)
Sustainability orientation	0.090**	0.099***	0.123***	0.091***
	(0.031)	(0.028)	(0.030)	(0.026)
Ethical climate	1.818	2.414	0.275	1.342
	(1.664)	(1.511)	(1.799)	(1.582)
Industry carbon intensity	-0.853	0.926	-0.665	0.850
	(1.459)	(0.890)	(1.470)	(0.889)
		Control variables included		
Year fixed-effects	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes
Constant	92.243	-354.964*	89.824	-348.839*
	(125.228)	(169.144)	(125.702)	(168.878)
Observations	1577	1609	1577	1609
Within R-square	0.157	0.146	0.151	0.148
F-statistics	9.695	9.051	9.300	9.248

+ p<0.10 * p<0.05 ** p<0.01 *** p<0.001

DISCUSSION AND CONCLUSION

Our study contributes to the literature on board gender diversity and environmental innovation by extending tokenism theory to the East Asian context. We show that the impact of women directors on environmental innovation depends not only on reaching a critical mass but also on the presence of strong sustainability governance and ethical climates. Women directors are more likely to leverage gender-based expectations to advocate for environmental initiatives when supported by these organizational factors. Additionally, we show how high-carbon industries, facing environmental pressures, tend to be more open to diverse perspectives, amplifying the influence of women directors.

Practically, our results suggest that simply increasing women's representation on boards may not suffice to drive environmental innovation. Firms must also create supportive contexts through robust sustainability governance and strong ethical climates that empower women directors. In high-carbon industries, gender diversity and supportive structures can enable women directors to contribute significantly to environmental strategies. Policymakers should complement gender quotas with policies fostering sustainability governance, and firms should focus on appointing women directors with expertise in environmental issues while providing mentorship to enhance their influence.

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MS0158: Follow the Rivals? How Brand Awards Shape Competitors' Product Strategies

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MS0160: Win-win Human Resource Management Systems: Scale Development and Its Predictive Effect

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Win-win Human Resource Management Systems: Scale Development and Its Predictive Effect

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Abstract: Enhancing both organizational performance and employee well-being through human resource management systems (HRMS) has emerged as a pivotal issue of interest within both academic and practical realms. However, the current research has yet to provide a clear delineation of the win-win HRMS framework, lacks a robust and reliable set of metrics for quantifying the effectiveness of such systems, and has not thoroughly investigated the impacts of win-win HRMS on the organization and employees. Therefore, this study aims to develop a win-win HRMS scale and provide potential answers to what win-win HRMS are, and whether and how such systems can realize a win-win outcome.

Our research first undertook an exhaustive literature review on HRMS within the esteemed SSCI and CSSCI journals from 2015 to 2022, resulting in 126 valid articles. We classified the literature into “well-being-oriented” and “performance-oriented” based on outcome indicators and summarized 10 dimensions common to both orientations. Second, through benchmarking analyses with leading companies and interviews with managers, we assessed the external validity of these dimensions, narrowing them from 10 to 8. Third, drawing on existing research, we developed a pool of 51 items across 8 dimensions and developed a win-win HRMS questionnaire. Fourth, we

conducted both pilot and formal surveys to evaluate the psychometric properties of the questionnaire, establishing its structure, dimensions, and items.

The study identified that the win-win HRMS consists of eight dimensions: values-based recruitment, extensive training, developmental performance appraisal, competitive compensation, communication and information sharing, long-term employment, internal labor market, and teamwork. The self-developed scale demonstrated strong internal consistency reliability and favorable structural, construct and predictive validity. Win-win HRMS not only positively influences both organizational performance and employee well-being, but it also enhances organizational performance through the mediating role of job satisfaction.

Theoretically, the results offer a dual perspective on the functions of HRMS from both the organization and employee sides, clarifying the content and structure of win-win HRMS and developing a measurement tool. It also reveals the process and outcomes through which HRMS can achieve a win-win. Practically, this research encourages enterprises to recognize the potential for synergistic development between organizations and employees and offers a feasible pathway to simultaneously enhance organizational performance and employee well-being.

Keywords: win-win human resource management system; work well-being; psychological well-being; company performance; scale development

APBRS01-2: Corporate Digital Transformation and Product Market Performance: Evidence from China

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Corporate digital transformation and product market performance:

Evidence from China

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Abstract: Digital technology provides strong support for enhancing corporate competitiveness and expanding market share. Exploring whether and how corporate digital transformation impacts product market competitiveness has become a crucial topic. Using a data set of Chinese A-share listed firms from 2010 to 2023, we find that corporate digital transformation significantly improves product market performance; this effect is more pronounced when intellectual property protection is weak. We further reveal that corporate digital transformation enhances product market performance by reducing information asymmetry, increasing analyst coverage and media attention, and improving trade credit. Finally, we demonstrate that the improved product market performance enhances corporate performance, which is the important economic outcome of digital transformation. Our research elucidates the causal relationship between digital transformation and product market performance, provides theoretical insights and empirical evidence to promote corporate digital transformation, and facilitate companies to better adapt to the wave of the digital economy and enhance product market competitiveness.

Keywords: Corporate digital transformation, product market performance, information asymmetry, analyst coverage, media attention, trade credit



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APBRS03-3: The Unbalanced Impact of Digital Transformation on Business Model Innovation

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The Unbalanced Impact of Digital Transformation on Business Model Innovation

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Extended Abstract

Digital transformation (DT) is profoundly influencing and reshaping business models. We explore the relationships between digital transformation and business model innovation (novelty-centered/efficiency-centered), and consider enterprises' innovation search and competitive intensity to study their boundary conditions. Our research explains that there is an inverted U-shaped relationship between digital transformation and efficiency-centered business model innovation, and a positive relationship between digital transformation and novelty-centered business model innovation. Between digital transformation and efficiency-centered business model innovation, both innovation search and competitive intensity play positive moderating roles, while between digital transformation and novelty-centered business model innovation play negative moderating roles.

Keyword: Digital Transformation (DT); Business Model Innovation (BMI); Competitive Intensity;

1. Introduction

How digital transformation(DT) affects business model innovation(BMI) has become an important issue of common concern in academia and the business community. Despite the continuous accumulation of research findings and the general consensus on the promoting role of digital transformation in business model innovation(BMI), when observing different types of business model innovation(novelty-centered/efficiency-centered), the results regarding the impact of digital transformation are ambiguous, and there are even numerous contradictory viewpoints. When understanding the potential impact mechanism of digital transformation on business model innovation, an interesting research question is whether the impact of digital transformation is balanced and robust for different types of business model innovation . In this paper, we study the impact of digital transformation on business model innovation (novelty-centered/efficiency-centered) and test its boundary conditions. Our research not only contributes to digital business model innovation (DBMI) by proposing and empirically testing the impact of digital transformation on different types of business model innovation (novelty-centered/efficiency-centered), but also explores the roles played by "competitive intensity" and "innovation search" in the relationship between digital transformation and business model innovation, thus making contributions to the emerging literature on strategic competition and knowledge search in the digital era.

2. Literature and framework

2.1. Digital transformation and business model innovation

Hypothesis 1. (H1): There is an inverted U-shaped relationship between digital transformation and efficiency-centered business model innovation.

Hypothesis 2. (H2): There exists a significant positive relationship between digital transformation and novelty-centered business model innovation.

2.2. Moderating effect of innovation search on ‘DT-BMI’ relationship

Hypothesis 3. (H3): Innovation search positively moderates the relationship between digital transformation and efficiency-centered business model innovation.

Hypothesis 4. (H4): Innovation search negatively moderates the relationship between digital transformation and novelty-centered business model innovation.

2.3. Moderating effect of competitive intensity on ‘DT-BMI’ relationship

Hypothesis 5. (H5): Competitive intensity positively moderates the relationship between digital transformation and efficiency-centered business model innovation.

Hypothesis 6. (H6): Competitive intensity negatively moderates the relationship between digital transformation and novelty-centered business model innovation.

3. Method and results

3.1. Data collection and Sources

We selected enterprises distributed in industries such as electronic information, automobile manufacturing, medicine and health, education and technology as the objects for data collection. And we adopted the method of questionnaire survey to collect data.

3.2. Variables

Dependent variable: Business Model Innovation

Explanatory variable: Digital Transformation.

Moderator variable: Innovation Search and Competitive Intensity

Control variables: Enterprise Size; Age of business; Region; Industry

3.3. Results

Table 1 contains the results of the efficiency-centered business model. The results of Model 2 report a significant positive relationship between digital transformation and efficiency-centered business model innovation ($\beta = 0.324$, $p < 0.001$). Hypothesis 1 is not supported. In Model 3 and Model 4, we test the moderating effects of innovation search and competitive intensity, and Hypotheses 3 and 5 are supported.

Table 1. The impact of digital transformation on efficiency-centered business model innovation

Variables	Efficiency-centered Business Model Innovation			
	Model 1	Model 2	Model 3	Model 4
<i>Enterprise Size</i>	0.000** (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
<i>Age of business</i>	0.007 (0.004)	0.007 (0.004)	0.007* (0.004)	0.006 (0.004)
<i>Region</i>	0.205 (0.144)	0.116 (0.137)	0.164 (0.136)	0.162 (0.129)
<i>Industry</i>	0.169 (0.144)	0.125 (0.137)	0.122 (0.134)	0.096 (0.127)
<i>Digital Transformation</i>		0.319*** (0.051)	0.239*** (0.054)	0.203*** (0.051)
<i>Digital Transformation</i> × <i>Innovation Search</i>			0.193*** (0.050)	0.163*** (0.048)
<i>Digital Transformation</i> × <i>Competitive Intensity</i>				0.303*** (0.049)
<i>_cons</i>	2.692*** (0.184)	1.633*** (0.243)	1.124*** (0.286)	0.545* (0.287)
<i>F test</i>	2.504*	9.952***	9.919***	14.508***
<i>R Square</i>	0.030	0.133	0.177	0.265

Note. Standardized regression coefficients are reported, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2 contains our results on novelty-centered business model innovation. The results of Model 2 report a significant positive relationship between digital transformation and novel business model innovation ($\beta = 0.139$, $p < 0.05$), and Hypothesis 2 is thus supported. In Model 3 and Model 4, we test the moderating effects of innovation search and competitive intensity, and Hypotheses 4 and 6 are supported.

Table 2. The impact of digital transformation on novelty-centered business model innovation

Variables	Novelty-centered Business Model Innovation			
	Model 1	Model 2	Model 3	Model 4
<i>Enterprise Size</i>	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
<i>Age of business</i>	0.007 (0.004)	-0.011** (0.005)	-0.009** (0.005)	-0.009* (0.005)
<i>Region</i>	0.205 (0.144)	0.309** (0.156)	0.300* (0.155)	0.308* (0.154)
<i>Industry</i>	0.169 (0.144)	0.096 (0.155)	0.133 (0.155)	0.092 (0.155)
<i>Digital Transformation</i>		0.143** (0.056)	0.135** (0.056)	0.159*** (0.057)
<i>Digital Transformation</i> × <i>Innovation Search</i>			-0.124** (0.055)	-0.114** (0.055)
<i>Digital Transformation</i> × <i>Competitive Intensity</i>				-0.163** (0.069)
<i>_cons</i>	2.883*** (0.269)	1.633*** (0.243)	3.221*** (0.307)	3.679*** (0.361)
<i>F test</i>	3.107**	3.815***	4.054***	4.325***
<i>R Square</i>	0.037	0.055	0.070	0.086

Note. Standardized regression coefficients are reported, *p < 0.05, **p < 0.01, ***p < 0.001.

4. Discussion

This study constructs a theoretical model of the impact of digital transformation on business model innovation and examines the moderating effects of innovation search and competitive intensity. We found that there is an inverted U-shaped relationship between digital transformation and efficiency-centered business model innovation, and a positive relationship between digital transformation and novelty-centered business model innovation. Between digital transformation and efficiency-centered business model innovation, both innovation search and competitive intensity play positive moderating roles, while between digital transformation and novelty-centered business model innovation play negative moderating roles.

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APBRS04-1 : Are We Really the Same? Comparing Digital Transformation Journey between Higher Education and Energy Industry

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Are we really the same?

Comparing Digital Transformation Journey between Higher Education and Energy Industry

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Extended Abstract

Digital Transformation (DX) has become a powerful tool to drive changes in different industries all over the world. This study aims to understand the different journeys between higher education and the energy industry in adopting DX in the context of Thailand. Both sectors demonstrate the critical role of DX in responding to global challenges; however, they set objectives and implement technologies differently based on their specific needs and expected impacts. While higher education represents a massive disruption industry, the energy industry represents a low degree of disruption. In this study, qualitative and quantitative approaches were adopted. In-depth interviews with management and employees were also conducted. The frequency of sentences and words with common themes was mentioned through the application of ATLAS.ti software. The digital maturity questionnaires adopted from the digital maturity model 5.0 developed by Forrester were distributed to the interviewees. In total, there were eight interviewees from each industry of different levels. Both sectors were similar in total maturity scores. Some specific areas, such as clear communication, staff with high capability, and DX staff with digital skills, showed visible differences in the organisation's implementation of their DX strategies. The results

from the interviews created the DX implementation framework, which combined intent, pillars, and foundation. The results showed that higher education focused on supporting educational experiences and operations through the integration of digital technology, whereas the energy industry focused on improving operational efficiency and adjusting itself to align with energy trends in the future

Keyword: Digital Transformation; Higher Education; Energy Industry; Digital Maturity

1 Introduction

Digital transformation has emerged as a critical force driving change across various sectors globally, marking a significant shift towards adopting digital technologies that redefine traditional products and services. This trend is evident across numerous economic and societal sectors, altering how organizations operate and deliver value (Kaminskyi, et. Al., 2018). The digital transformation in the energy sector is fundamentally reshaping the landscape, driven by the need to enhance operational efficiency, reduce costs, and improve sustainability. With a focus on integrating cutting-edge technologies such as big data analytics, artificial intelligence, and cloud computing, energy companies are not only optimizing their existing infrastructures but also preparing for future energy demands. This study explores the current landscape and identifies critical success factors for digital transformation in higher education, comparing them with those in the energy industry, which shares a similar level of digital maturity. It aims to highlight the differences in the digital transformation processes between these two industries. Additionally, this research develops guidelines for integrating digital transformation within higher education frameworks. These guidelines will provide alternative strategies for businesses to achieve competitive advantages and ensure long-term sustainability.

2 Literature

2.1 Digital Transformation in Higher Education

To initiate digital transformation in education, administrators must first establish a clear vision to create and manage an effective learning environment. Stakeholders should be engaged in this process by

providing access to technologically appropriate content and infrastructure. Both teachers and students need training to align with the digital transformation vision, supported by in-service training activities (Balyer and Öz, 2018). The urgency of digital transformation in education was highlighted in the spring of 2020 due to the COVID-19 pandemic (Bogdandy et al., 2020). To promote broader use of educational technology, it is crucial for Higher Education institutions to develop effective strategies (Bond et al., 2018).

2.2 Digital Maturity

During the digital era, organizations have prioritized and invested in digitalization. Consequently, effective diagnostic tools for evaluating their current digital status have become essential for organizations to develop and sustain continuous improvement strategies. Therefore, a maturity model serves as a tool to assess the current stage and create an organizational digital roadmap (Hein-Pensel et al., 2023; Kocaoglu and Kirmizi, 2024). The Digital Maturity Model 5.0 developed by Forrester Research; Inc. was utilized in this study (VanBoskirk). Aside from the model related to the executed digital strategy, the insurers were questioned about the particulars of their digital transformation (Ćurak et al., 2024;). The goal of this model is “to help companies assess their overall digital readiness.” This model is used to evaluate the fundamental elements of a corporation’s overall degree of digital transformation (VanBoskirk).

2.3 The Disruption index

Digital transformation involves integrating digital technologies into all aspects of a business, fundamentally changing how organizations operate and deliver value to customers. This process often results in a higher Disruption Index, reflecting the extent of changes and innovations implemented (Bharadwaj et al., 2013; Reis et al., 2018). Studies have examined the Disruption Index across different industries, showing varying levels of digital maturity and transformation processes. For instance, higher education and energy sectors may share similar digital maturity levels, but their transformation processes and impacts differ significantly due to unique operational and regulatory environments (Sebastian et al., 2017; Nambisan et al., 2019).

3 Method and results

This study applies a case study approach (Eisenhardt, K. M., 1989) to study the digital transformation in higher education and energy industry. For higher education, the medical school was selected as a case according to the activities of this school including both academic and service (hospital). For energy industry, leader energy company in Thailand was selected. This company has operated more than 40 years across Asia Pacific area. The reason to selected these 2 cases is they have the same digital maturity level (the digital maturity score is 59.33 for higher education and 59.00 for energy company) as see in figure 3.1.

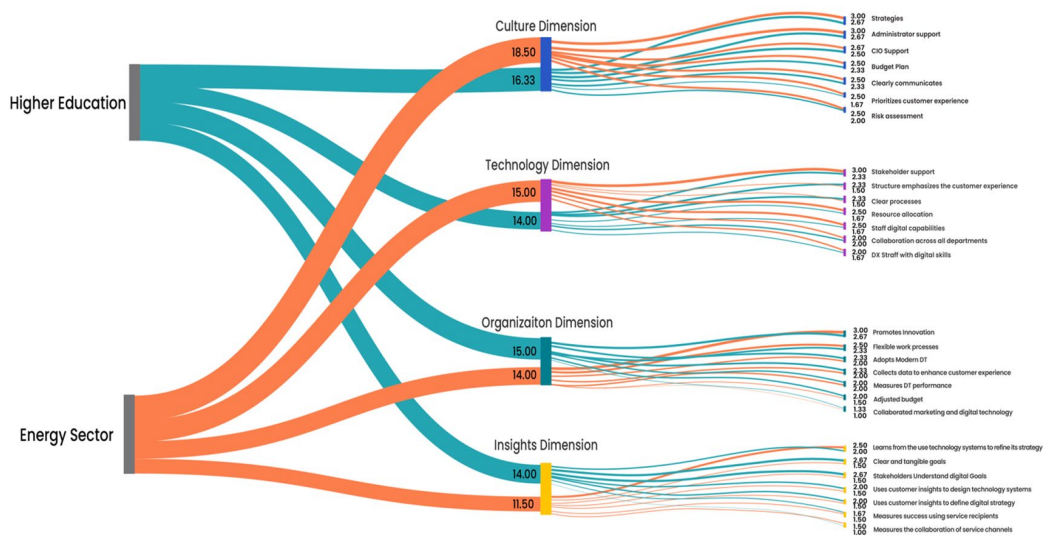


Figure 3.1: Digital Maturity Analysis

For qualitative method, this study adopted by Glaser and Strauss (2012) was applied with semi-structured interviews. The interviews were conduct among employees who involved in the digital transformation processes. The participants were asked for consent and data were recorded during the interviews. After collected the data, the recorded files were transcribed and the transcription was coded and analyzed by content analysis. The codes and themes were set and analyzed by 3 academic experts. The frequency of sentences and words with common themes was mentioned (Kurasaki, 2000). To facilitate the analysis, ATLAS.ti software was used. According to the interview results, the digital transformation implementation frame work was showed in figure 3.2.

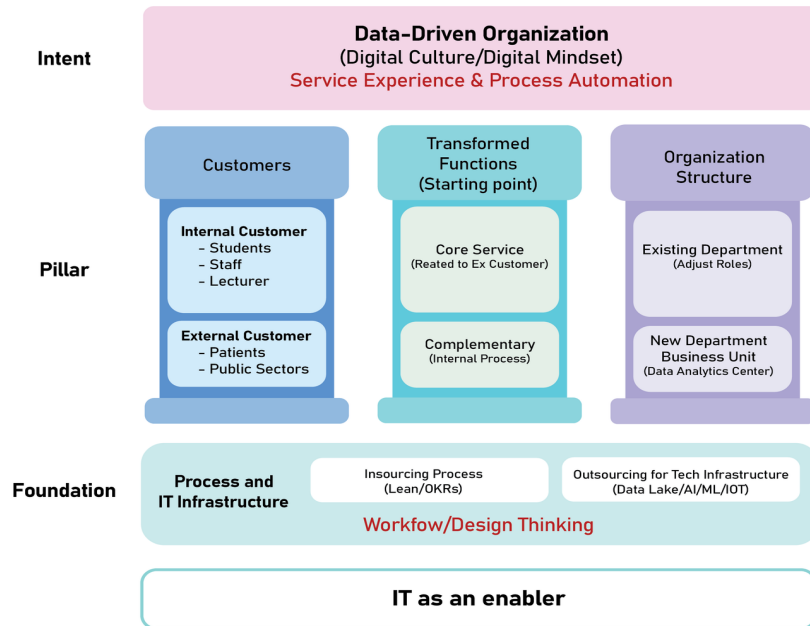


Figure 3.2: The Digital Transformation Implementation Framework

4 Conclusion

This study increases knowledge of similarity and difference of DX between higher education and energy industry. This comparison of these two sectors indicate how different industries can adopt DX to improve efficiency and flexibility of operation. Moreover, the findings provide best practices for higher education in Thailand to strategically integrate DX to achieve competitive advantage and sustainability in long-term. This study provides theoretical contribution to academic area by offering insights related to DX in higher education and energy industry. Findings introduce a framework which present the factors that impact DX in all aspects. Other industries or context can apply methodology and adopt the framework to understand DX mechanism and factors. and operation system. By adopting digital maturity in evaluating digital readiness level and organizational ability of implementing digital technology, this study enhances the understanding of organizational evaluation and capability improvement to respond to digital challenges and opportunities. Moreover; this study aims to provide significant recommendation for management to embrace digital transformation in organization. By focusing on research framework, this study can provide strategies which can apply to achieve managing

digital transformation; Create learning and innovation culture, Invest in responsive business technology, Operational improvement with automation, Enhance customer experience through insights, Manage digital risks, and Continuously evaluate and improve digital strategy.

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APBRS04-2 : Digital Economy and Accounting Information Comparability: Evidence from China

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Abstract

In the development of digital economy, the underpinning digital infrastructure enables firms to adopt digital technologies – artificial intelligence, blockchain, cloud computing, and big data, which automate data collection, storage, analysis, and reporting. The integration of digital technologies in accounting cultivates an environment in which accounting information becomes more consistent, transparent, and reliable than previously observed. In this paper, we examine whether and how the development of digital economy improves accounting information comparability. Based on the variation in digital infrastructure across cities in China, we conduct principal component analysis to construct an index that captures the development of digital economy. Using data from Chinese listed firms in 2011-2019, we find that digital economy increases accounting information comparability, as reflected in a closer mapping of firms' stock returns to earnings in cities with a higher level of digital economy. This positive

effect is more pronounced for the firms located in the eastern region, followed by more analysts, and operating in a less uncertainty environment. We further examine the mechanism through which digital economy improves accounting comparability. We find that the development of digital economy alleviates firms' agency conflicts through improving internal control, reducing information asymmetry, and mitigating accrual-based earnings management, thus enhancing accounting comparability across firms. Our findings provide evidence on the advantages of city-level digital economy growth in improving accounting comparability, highlighting the role of local governments in fostering an environment conducive to the development of digital economy and accounting comparability.

Keyword: Digital Economy, Accounting Information Comparability, Internal Control Quality, Information Asymmetry, Accrual-based Earnings Management

1. Introduction

The fast-growing digital economy has become a new driving force for economic development. Digital economy includes all economic activities that operate on digital platforms and that are enabled by digital technologies. As an integral part of digital economy, digital infrastructure provides the foundational technologies and systems for users to access the digital platforms and utilize the digital services. Digital infrastructure, consisting of high-speed internet networks, mobile devices, data centers, cloud computing services, cybersecurity measures, and more, ensures that digital services are reliable, fast, and secure. Further, the development of digital economy drives demand for more advanced and extensive digital infrastructure. Digital economy and digital infrastructure are mutually reinforced. Governments play an important role in fostering this relationship through directly investing or providing incentives for private sectors to invest in digital infrastructure projects.

Digital infrastructure enables firms to adopt digital technologies – artificial intelligence, blockchain, cloud computing, and big data, which automate data collection, storage, analysis, and reporting. The integration of digital technologies cultivates an environment in which accounting information becomes

more consistent, transparent, and reliable than previously observed. In this paper, we examine whether and how the development of digital economy improves accounting information comparability.

2. Literature and Hypothesis

Accounting information comparability means that similar economic events should receive similar accounting treatments (Barth, 2008). Prior literature on the determinants of accounting comparability has examined the influencing factors from two dimensions. At the macro-level, studies find that mandatory IFRS adoption improves accounting comparability while the improvement effect is affected by the law, culture, regulation, and enforcement environment of the adoption countries (Yip and Young, 2012; Barth et al., 2012; Brochet et al., 2013; Cascino and Gassen, 2015). At the micro-level, accounting comparability is influenced by firm-level characteristics, including external audits (Francis et al., 2014; Chen et al., 2020; Shi et al., 2021), internal governance mechanisms (Fang et al., 2015; Endrawes et al., 2018; Biswas et al., 2022; Afzali, 2023), and management incentives (Lee et al., 2016; Peng et al., 2022; De Franco et al., 2023).

With the rapid development of digital economy, China has distinguished itself by building a mobile-first, fiber-intensive, and inclusive digital infrastructure (Jiang and Murmann, 2022). Prior literature examines the economic consequences of digital economy. At the province or city level, based on the digital economy index constructed by the principal component analysis, studies find that digital economy improves the development of total factor productivity and green innovation in China (Pan et al., 2022; Ma and Zhu, 2022). At the firm level, research shows that firms' digital transformation increases investment efficiency and firm value (Saleem et al., 2020; Du et al., 2023; Chen and Srinivasan, 2024), and investors respond positively to firms' blockchain-related announcements (Cheng et al., 2019; Cahill et al., 2020). Furthermore, studies find that firms' digital transformation, in particular the adoption of artificial intelligence, improves accounting information quality, as reflected in lower discretionary accruals and closer mapping of accruals and cash flows (Anantharaman et al., 2023; Fang et al., 2023).

In this study, we will examine the influencing factor of accounting comparability at the meso-level – the regional development of digital economy. We examine whether and how the city-level development of digital economy affects accounting information comparability across firms.

3. Method and Results

Using the variation in digital infrastructure across cities in China, we first construct a development index to capture the growth and inclusivity of the digital economy by performing principal component analysis on the internet and mobile phone penetration rates, digital employment and contribution to GDP, and access to digital financial services. We then calculate the accounting information comparability for Chinese listed firms by following the approach proposed by De Franco et al. (2011), which is based on the closeness of the mapping of stock returns to earnings across firms. De Franco et al. (2011) defines the accounting system as a mapping from economic events to financial statements, and thus for a given set of economic events (as measured by stock returns), two firms have comparable accounting systems if they produce similar financial statements (as measured by earnings). Finally, we perform empirical tests to examine whether and how the development of digital economy affects accounting comparability.

Employing data from 2011 to 2019, we find that digital economy improves accounting information comparability, as reflected in a closer mapping of firms' stock returns to earnings in cities with a higher level of digital economy. This positive effect is more pronounced for the firms in the eastern region, followed by more analysts, and operating in a less uncertainty environment. We further examine the channels through which digital economy increases accounting information comparability. We find that the development of digital economy alleviates firms' agency problems through improving internal control quality, reducing information asymmetry, and mitigating accrual-based earnings management, thus enhancing accounting information comparability across firms. These results are robust to various sensitivity tests and endogeneity tests.

4. Conclusion

Our findings provide evidence on the advantages of city-level digital economy growth in enhancing accounting information comparability. Our study also highlights the important role of local governments in investing in digital infrastructure to foster an environment conducive to the development of digital economy and accounting comparability.

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APBRS04-3 : Implementation of Artificial Intelligence (AI) for Sustainable Business Model Innovation: Systematic Literature Review and Future Research Agenda”

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**Implementation of Artificial Intelligence (AI) for Sustainable Business Model Innovation:
Systematic Literature Review and Future Research Agenda**

APBRS04-3

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Implementation of Artificial Intelligence (AI) for Sustainable Business Model Innovation: Systematic Literature Review and Future Research Agenda

Abstract

The rapid advancement of Artificial Intelligence (AI) presents countless opportunities for firms to become more sustainable and innovative. To explore this phenomenon in depth, this paper examines the transformative potential of AI in redefining business model strategies, enabling firms to achieve greater environmental and social responsibility while maintaining profitability. Through a systematic literature review of 120 papers from five databases—namely, Scopus, ScienceDirect, Emerald, Taylor & Francis, and JSTOR—published between 2007 and 2024, we analyzed the key roles of AI in enhancing sustainable business models and its contributions to value proposition, value creation (and value delivery), and value capture. Our analysis revealed several theoretical perspectives, including dynamic capability theory, institutional theory, stakeholder theory, the resource-based view (RBV), and transaction cost theory. Building on literature related to sustainable business model innovation, we identified various mechanisms and strategies that firms can employ to leverage AI for innovating sustainable business models. In addition, we propose a holistic framework and outline a research agenda for future studies. This framework can also be valuable for practitioners in strategically implementing AI to transform their business models toward sustainability.

Keywords - Sustainability, Sustainable, Business model innovation, Artificial Intelligence (AI), Systematic literature review, Industry 5.0

1. Introduction

At present firms and organizations have many perspectives to create, propose, delivery and capture the firm's value and performance. The business models were mentioned to improve the performance (Freudenreich et al., 2020). From evolution, firms continuously develop innovation to enhance their firms via innovation and technologies (Kraus et al., 2023). This has led to innovation in the business model. The firms bring the business model innovation to survive the business competition (Kraus et al., 2023; Khizar et al.,2022). Pollution, climate change, and global warming are crucial problems on the Earth. UN reported that the emissions of greenhouse gas (GHG) triggered a range of disastrous threats and the temperature reached new highs in 2023(United Nations Environment Programme & UNEP DTU Partnership, 2024). The previous researchers explored achieving sustainable resource management according to Sustainable Development Goals (SDGs) outlined in the UN 2030 (Di Vaio et al., 2020; Khizar et al., 2022).

The previous researchers suggested that the firms can reach their goals by connecting sustainability and innovation. In terms of macroeconomics, firms, and the related stakeholders can improve the sustainability of the firms and the environment (Di Vaio et al., 2020). The firms should re-think every procedure and process in their business to improve society. The previous researcher also shed light on implementing artificial intelligence (AI) and knowledge management systems (KMS). Current AI is a trend in the daily operation of human life. This topic is in the nascent stage. Most previous articles were in the systematic literature review (SLR) and qualitative (case study) papers. The gap in the previous literature shows that the SLR papers do not align on these topics. The most kinds of literature were in digitalization, information technology, industry 4.0, etc. This led to the research gap in exploring the literature review on "Implementation of Artificial Intelligence (AI) for Sustainable Business Model Innovation"

This paper is a systematic literature review on sustainability, sustainable business model innovation, and artificial intelligence (AI). Therefore the research question of this paper as below:

RQ1: How do the firms implement an AI-driven sustainable business model within business ecosystems?

RQ2: How do they differ from traditional business models in the value proposition, value creation, and value capture?

RQ3: What are the current research methodologies, and what are the future research directions?

The article is a systematic literature review of total 120 papers from five databases—namely, Scopus, ScienceDirect, Emerald, Taylor & Francis, and JSTOR—published between 2007 and 2024. The main concepts and the related theories were summarized. The findings were conclusion and synthesis in content analysis, descriptive analysis, and thematic analysis. The keywords were processed via VOSviewer tools (Wang et. al., 2022).

2 Literatures and Research Methodology

2.1 Literature Review

2.1.1 Sustainable business model (SBM) and Sustainable business model innovation (SBMI)

SBM is the reformation of the conventional business model concept with two characteristics added: (1) the objective of concept, principle, and goal focus on sustainability (Broccardo et al., 2023), and (2) integration of sustainability into the business model (value proposition, value creation, delivery activities, and value capture mechanisms) (Geissdoerfer et al., 2018). SBMs generate sources of competitive advantage and value for customers, stakeholders, society, the environment (Goni et al., 2021), and economic value (Velter et al., 2020). SBM contained financial and non-financial - ecological and social domains (Broccardo et al., 2023).

SBMI's corporate interest expanded to merge societal issues into the BMI process (Bocken and Geradts, 2020). SBMI contains heterogeneous metrics (social, environmental, and economic) and includes diverse stakeholders in the innovation processes (Bocken and Geradts, 2020). This is a fusion of the concept of

the SBM and BMI. SBMI mainly aims for (1) sustainable development, reducing negative impacts on the ecological, expanding the long-term prosperity of the organization and its stakeholders, (2) adopting solutions or characteristics that foster sustainability in its value proposition, creation, and capture value-network (Geissdoerfer et al., 2018). SBMI is the complex significant business processes and procedures from the conceptualization and implementation of SBM (Bocken and Geradts, 2020). SBMI is composed of the development of entirely new business models, the diversification, acquisition, and transformation from one business model to another (Geissdoerfer et al., 2018). Therefore, the dynamic capabilities theory is appropriate for confronting growing societal and environmental issues (Bocken and Geradts, 2020; Coffay et al., 2024). Climate change and global warming are crucial problems on the Earth. UN reported the emissions of greenhouse gas (GHG) triggered a range of disastrous threats and temperatures reached new highs in 2023 (United Nations Environment Programme & UNEP DTU Partnership, 2024). SBMI is distinctive in improving and resolving social and environmental problems (Goni et al., 2021).

2.1.4 Artificial intelligence (AI) and AI-Powered capabilities

The founders of the discipline of the word “artificial intelligence” (AI) occurred in 1958 by John McCarthy. The initial concept is to develop programming responses or answers similar to humans (McCarthy, 1987). At that time, many computer scientists argued that can’t happen. In the information system field, there are many kinds of programs in digital technologies such as enterprise resource planning (ERP), transaction processing systems (TPS), business intelligence (BI), data warehouse, etc. The unique identity of AI is a human mimic, human intelligence, and human-like behavior (Sullivan and Wamba, 2024; Bilal et al., 2024; Du and Xie, 2021). The definition of AI is “the ability of machines or computer processing to perform human-like cognitive tasks (e.g., deep-learning, design, serious thinking, decision-making, automation, interactive, and innovative problem solving) to achieve individual requirement, predetermined organizational and societal goals (Abou-Foul et al., 2023; Bilal et al., 2024; Mikalef et al., 2023). AI is a cutting-edge technology in which programmers develop the algorithms for

the intelligence learning curve. Addition, it include machine learning, neural networks, and natural language processing (NLP).

2.2 Research Methodology

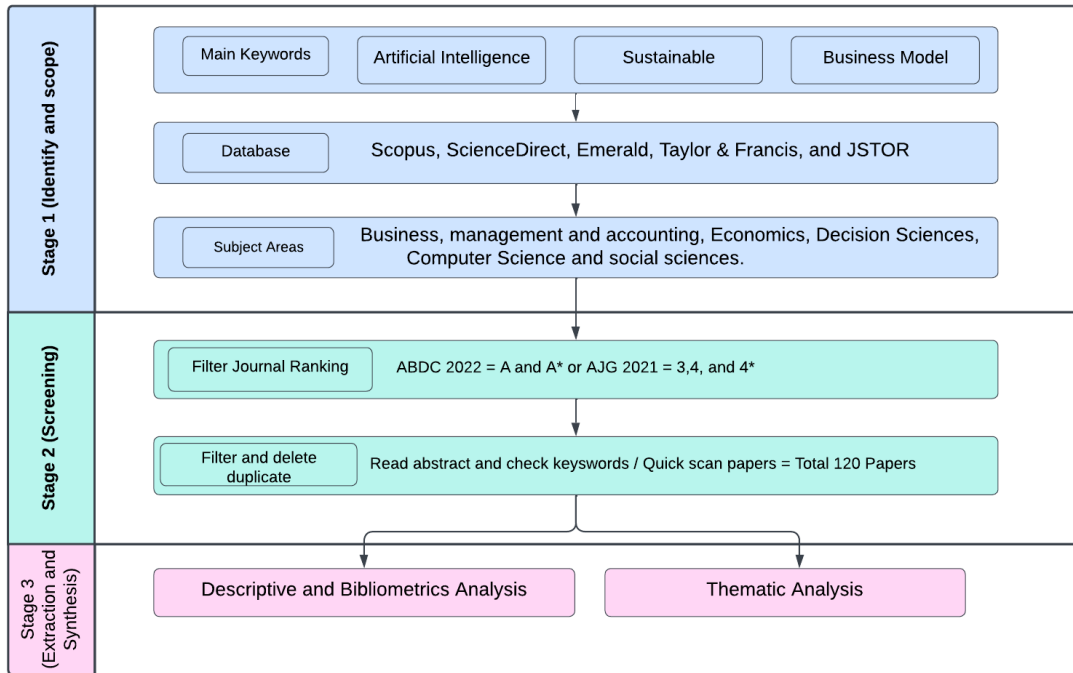


Figure1: Research process

No.	Database	Query	Result	Filter	Remark
1	Scopus	TITLE-ABS-KEY (("sustainab*") AND ("business model*" OR "business model innovat*" OR "value proposition*" OR "business model design") AND ("artificial Intelligence" OR "AI" OR "A.I." OR "intelligen* system*" OR "machine learning" OR "deep learning*" OR "neural network*"))	488	17	
2	ScienceDirect	((("sustainable" OR "sustainability") AND ("business model" OR "business model innovation" OR "value proposition") AND ("artificial Intelligence" OR "AI" OR "machine learning" OR "deep learning")))	1096	50	Use fewer boolean connectors (max 8 per field)
3	Emerald	(content-type:article) AND (title: "sustainable" OR "sustainability") AND (title: "business model" OR "business model innovation" OR "sustainable business model innovation" OR "sustainable business model") AND (title: "artificial Intelligence" OR "AI" OR "machine learning" OR "deep learning" OR "intelligent system")	1006	30	Can't use * Separate year for download 50 papers per RIS
4	Taylor & Francis	((("sustainable" OR "sustainability") AND ("business model" OR "business model innovation" OR "value proposition" OR "sustainable business model innovation" OR "sustainable business model") AND ("artificial Intelligence" OR "AI" OR "machine learning" OR "deep learning")))	1461	19	Can't use *
5	JSTOR	((("sustainable" OR "sustainability") AND ("business model" OR "business model innovation" OR "value proposition") AND ("artificial Intelligence" OR "AI" OR "machine learning" OR "deep learning")))	779	4	Limit boolean string
				120	

Table 1: Keywords search and total papers

3 Method and results

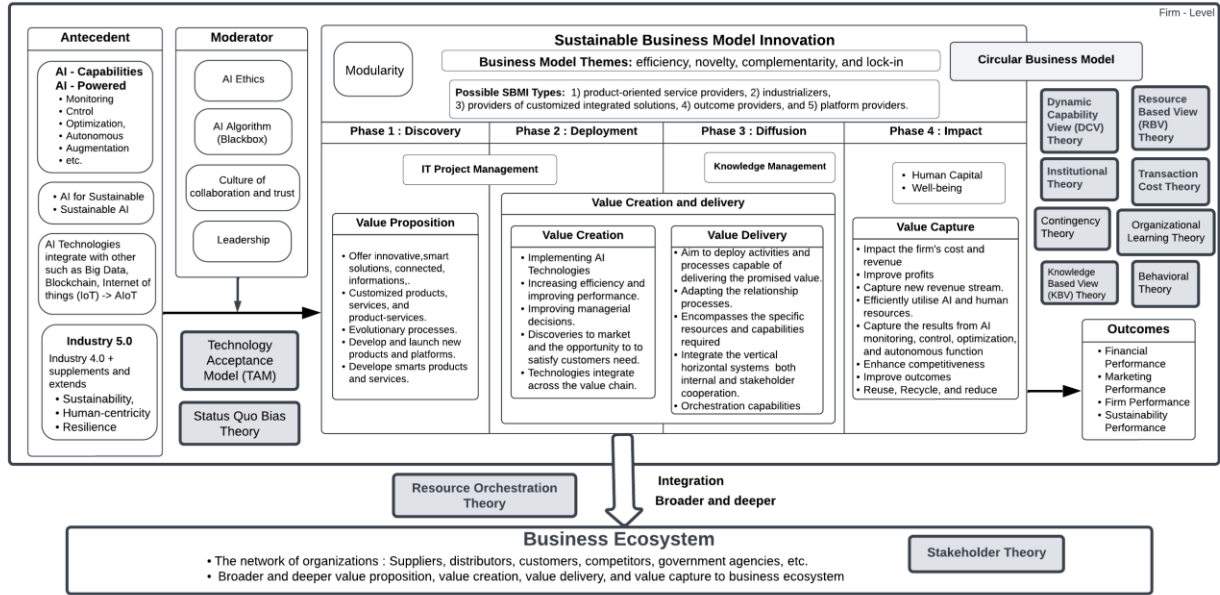


Figure2: A Holistic Framework of Implementation of AI for SBMI

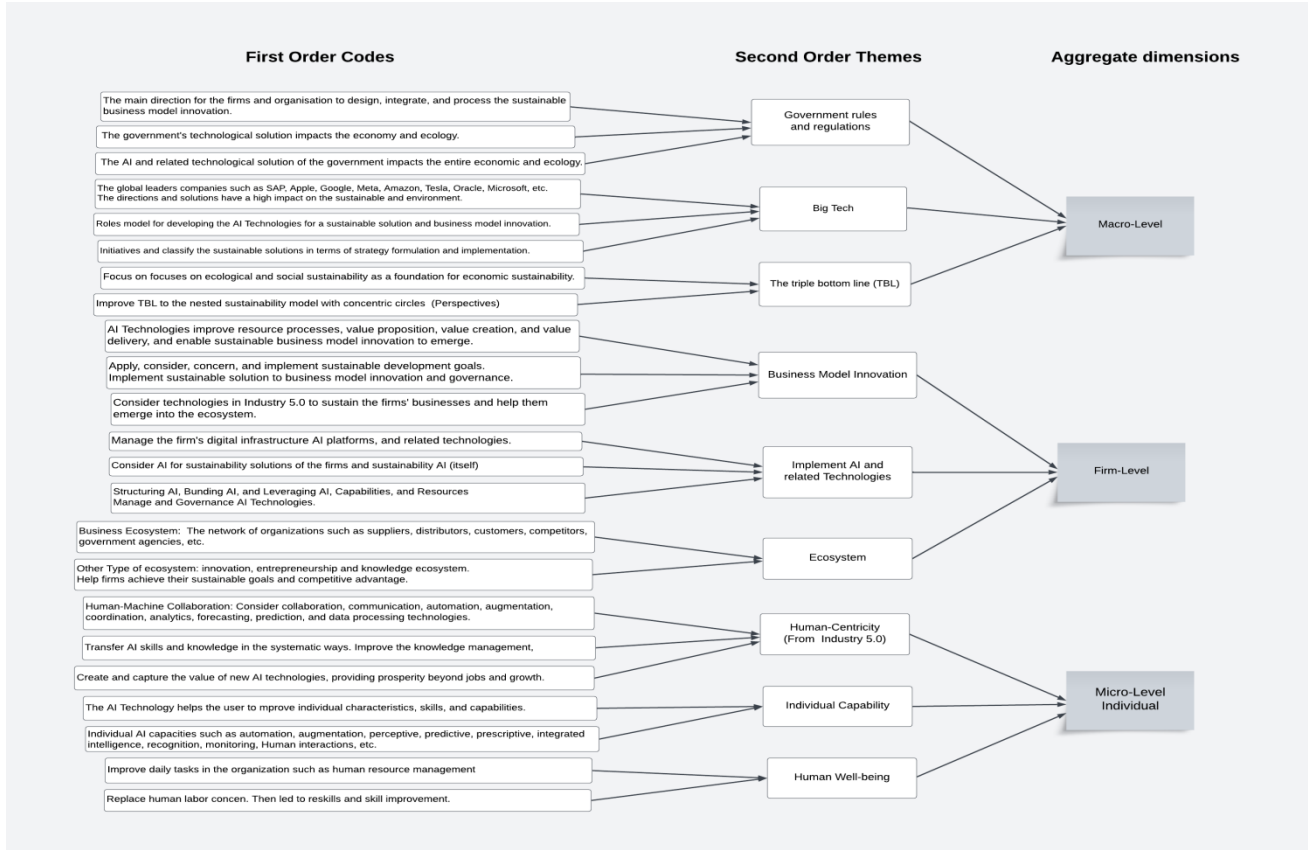


Figure3: First Order Codes, Second Order Themes, and Aggregate dimensions

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