

# Imitation, Technology, and Firm Performance: The Korean Firms Case in China

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## Abstract

**Purpose** – The main purpose of this study is thus to investigate the contingent effect of imitation strategies on firm performance in transition economies such as China, focusing on pure and creative imitation.

**Design/methodology** – We conducted a survey targeting department heads of each company who have more than 10 years work experiences. We assessed that the ability to gain trust and to access information from high-ranking informants would be greater if the firms were from the same country – Korea – as the lead researcher. A total of 200 highly reliable samples were obtained, which could effectively explain the nine variables set in the study. Relevant hypotheses were tested using a hierarchical linear model (HLM).

**Findings** – The findings suggest that SMEs' technology level also had a positive impact on performance. Firms with better technology had a positive impact on performance, irrespective of pure or creative imitation. This reflects the cases where many Korean SMEs entering China without high technology level lose their competitiveness due to Chinese firms' technology catch-up within a short period of time.

**Originality/value** – SMEs that lack technology and know-how need to focus on pure imitation strategies. It is possible that SMEs can perform creative imitation, but it seems difficult under the current circumstances. Therefore, SMEs with limitations in technology and know-how should maintain their competitive advantage for a while, by maintaining their pure imitation strategy.

**Keywords:** Imitation, Technology, Firm Performance, China, Korean Firms

**JEL Classifications:** F14, F23, M16

## 1. Introduction

Why do firms imitate each other? Many scholars have investigated firms' imitation strategies for a long time (e.g., Lee and Zhou, 2012; Shenkar, 2010). Firms naturally and unconsciously imitate each other in the process of developing new products and in the adoption of managerial methods and organizational forms (Lieberman and Asaba, 2006). Imitation is an effective tool for firms to enhance their performance in the short run. Firms can gain knowledge and know-how via imitation, which prevent them from being left behind their competitors (Song, 2015). Shenkar (2010b) demonstrated that as much as 98% of the value created by innovation accrues not to the innovators but to the copycats. However, firms may not always succeed by adopting imitation strategies to enter transitional economies like

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China. The key to the imitation strategy of a firm is how adaptively and efficiently the competitor firm's developed product or selected strategy is applied to the firm. Academic researchers and experts seem to have no theory other than the one that the imitation strategy is necessary for firms to gain competitive advantage (Zhou, 2006; Lee and Zhou, 2012). IBM, Samsung, and many other firms that have gained reputation worldwide chose the imitation strategy for growth in the initial stage (Lee et al., 2016; Hitt et al., 2019). From the fact that they chose the imitation strategy for growth and achieved stellar success, we can conclude that imitation could be an effective strategy for a firm to grow beyond being a simple copy tool.

Even though firms imitate the actions of other firms, not all firms are equally susceptible to imitative pressures and not all firms exert a similar imitative influence (Gimeno et al., 2005). Even though imitation is a prevailing phenomenon in the transition economies such as China, imitation strategy has received limited attention from scholars until recently (Shenkar, 2010b; Lee and Zhou, 2012). It is true that counterfeiting opportunities are increasing in countries such as China, where MNCs entering developing countries need to create joint ventures with local firms (Yang and Clarke, 2004). In China, imitation and theft of intellectual property does not require high-tech or skilled labor, but only cheap labor supply (Lai and Zaichkowsky, 1999). Since technology is not sufficiently mature yet, imitation is quite common in many Chinese industries, which contributes significantly to the country's economy (Lee and Zhou, 2012). Therefore, China provides a perfect setting for our research. It is interesting that many Chinese companies, as a latecomer, begin with imitation for their economic growth, but later develop into the innovation stage using the technology chase strategy (Song, 2015). In contrast, other East Asian countries such as South Korea acquired technology from abroad and actively implemented FDI attraction strategies in order to achieve rapid growth in the short run (Freeman and Sote, 1997).

Previous research (e.g., Luo, Sun and Wang, 2011; Lee and Zhou, 2012; Shenkar, 2010; Lee et al., 2016) has classified imitation into two types: 1) pure imitation, which refers to the practices that companies launch new products as replications of competitors' existing products, and 2) creative imitation, which refers to the practices that companies adapt the features of their competitors' original products and adds new features to its own products. Many Chinese firms started with purely imitating others, but later turned into creative imitation. For example, founded in 1984 in Qingdao, China, Haier was the first firm to manufacture refrigerators after receiving technology transfer from Germany (Frynas et al., 2018). At the beginning of its business, Haier adopted a strategy to imitate the superior technology of other firms. Initially, it produced refrigerators with a focus on the Southeast Asian market, including Malaysia and the Philippines (Liu and Li, 2002). Subsequently, Haier also manufactured computers, LCDs, and other electronic products. By diversifying its business portfolio, it turned to creative imitation rather than pure imitation, and became a representative firm in China. Established in 2010, Xiaomi entered the smartphone market dominated by Apple and Samsung as a latecomer. At the early stage, Xiaomi only launched low-priced smartphones, a tablet Mi-Pad and a wristband-type wearable Mi-Band by imitating the products of the market leaders, such as Apple. In addition, Xiaomi also followed Apple's marketing strategy of selling only one or two representative products annually as well as Toyota's just-in-time production method. As Xiaomi increase their sales and customer base, they begin to develop their own products that go beyond pure imitation (Lee et al., 2016). By the end of 2018, Xiaomi acquired 7.6% of the global smartphone market and ranked No. 4.

The status of creative imitation in China can also be reflected by the number of registration of intellectual property rights (IPRs). While it is true that China potentially has a very serious moral hazard in imitating the brands and product technology without registered IPR for both

domestic and foreign firms, an increasing number of firms, including those multinational firms worldwide, have come forward to apply for and register IPRs to the Chinese government. The number of patent applications in China increased from 173,327 in 2005 to 928,177 in 2014 and that of utility model applications increased from 139,566 in 2005 to 818,511 in 2014. In addition, the number of design right applications increased from 163,371 in 2005 to 514,555 in 2014 (China Intellectual Property Office, 2014). Those statistics clearly demonstrates that some of the large Chinese firms have naturally transformed their strategies from pure imitation to innovative imitation. However, on the other hand, most Chinese firms still stick to the pure imitation. A possible reason could be that pure imitation enables firms to increase their performance as well as competitiveness without significant financial investment in the mid and long term (Lee and Zhou, 2012).

Although considerable research has been conducted to examine the motivation of firms to adopt imitation strategy, but empirical research on the impact of imitation on the performance of firms is still limited (e.g., Ethiraj and Zhu, 2008), especially on the different impacts of different types of imitation. The main purpose of this study is thus to investigate the contingent effect of imitation strategies on firm performance in transition economies such as China, focusing on pure and creative imitation as suggested by Lee and Zhou (2012). Further, we also look at the environmental variables that affect the performance of imitation-driven firms, such as technology capability, competitive intensity, and imitation capability on firm performance. These environmental variables are frequently encountered in environmental uncertainty and environmental uncertainty promotes imitation as well as causes the likelihood of undesirable outcomes (Lieberman and Asaba, 2004). Moreover, unlike previous studies such as Zhou (2006) and Lee and Zhou (2012) focusing on how pure and creative imitation affects the performance of domestic firms in China, this study empirically analyzes the impact of the two types of imitation strategies on the performance of foreign firms, namely Korean SMEs in China. This study intends to extend existing theories on the impact of pure and creative imitation on firm performance as well as to suggest managerial implications that help firms to do business.

## 2. Theoretical Development

### 2.1. Imitation

Imitation is a widely-used term and found in many contexts. It is important that we clarify how we use it here. At the most macro-level, imitation can resemble adoption – commencing to use processes in use elsewhere – and, at another level something as small as a cigarette can simply be counterfeited. So, in the motor vehicles sector the dominant mode of production was Fordism (or Taylorism) where the Division of Labour and task simplification reflected available labour skills and low costs of resources. In Japan Fordism would be far less feasible and so production there gave rise to robotics, flexibility and Just in Time. To choose to produce vehicles by either mode of production today would reflect adaptation/ adoption rather than imitation. At the other extreme, imitation could come close to the risk of counterfeiting – depending on the strength of protection that innovators gain from Patent Laws. Game-playing is possible with patents as a successful company may find that its key elements attract speculative patents based on very similar characteristics. In the long run this can stifle innovation and resemble speculators who register internet domain names in the hope that they may one day be valuable. Also, innovators (with both Patents and with internet domain names) need to keep themselves updated as the story of Esso/Exxon demonstrated. In the

realm of products, the ways in which imitation can be damaging to an innovator has long been found in the work of Dobson (see Dobson 1998). Dobson (1998) argues that rivals who produce products that closely resemble the market leader can easily confuse the consumer. This is close to, but not the same as, producing a fake version of the market leader. Fake versions (high value goods such as perfume and Rolex watches attract fakes) risk legal action for copycatting/ passing-off an item and selling it as something that it is not. Much depends on proving that the consumer was misled – some even like to wear fake Rolex watches.

Imitation, as we use here, is one of the most effective strategies when firms encounter uncertainty (Lieberman and Asaba, 2006). The information quality of the innovator's product becomes poor and the possibility of using such information to develop a superior product is relatively limited when uncertainty is high (Ethiraj and Zhu, 2008). Ethiraj and Zhu (2008) argued that if uncertainty is low, the quality of information increases and that imitation can be used to develop superior imitative products. It is clear that imitation is a very useful tool for successful business execution of firms that lack technology. Imitation can be classified into several levels. Ding *et al.* (2011) divided imitation into four stages in the research on R&D policy of the Chinese drug industry as follows: (i) Pure imitation; (ii) Innovative imitation; (iii) Imitative innovation; and (iv) Independent Innovation. In terms of resource-based and enterprise capabilities, enterprises' R&D investment and activities, generally measured by their R&D concentration, can be recognized as unique resources and capabilities, which are considered one of the key determinants of successful innovation (Posen *et al.*, 2013; Posen and Martignoni, 2018).

Firms try to imitate each other in order to maintain their relative positions and neutralize the aggressive actions of the rivals (Lieberman and Asaba, 2006; Chen and Ma, 2017). Imitation is excellent in terms of its value and use as a strategy (Porter, 1985; Miner and Rahavan, 1999). Shenkar (2010) pointed out that imitation is largely underestimated in practice and that imitation can outperform innovation in many cases. A good imitator does not passively copy the idea, but creatively leverage the value of the idea by enhancing the quality or reducing cost of the original product (Shenkar, 2010). New ventures seeking creative imitation have technology capabilities in the local market of the emerging market. Park and Bae (2004) argued that as a strategic change was important for venture firms to enter developing countries and succeed, they need to make good use of creative imitation in order to succeed in internationalization, and that the main methods are (i) to practice creative imitation in the local market; and (ii) to make some transition of creative imitation in order to become a major player in the global market. It is thus believed that creative imitation exerts a stronger impact on firm performance than pure imitation.

However, some research results suggest a different view. By an empirical analysis of top and middle managers of 192 firms in China, Lee and Zhou (2012) demonstrated that pure imitation can help companies to gain market share in the short run. Companies that adopt pure imitation launch new products that are similar and functionally identical to their major rivals' products (Lee and Zhou, 2012), which may reduce the risks that consumers encounter when making purchase decisions (Van Horen and Pieters, 2012). In other words, a purely-imitated product is more likely to be accepted in the market. Hence, companies that adopt the pure imitation strategy are more likely to penetrate the market and increase their sales rapidly. On the other hand, although a creative imitation might not be quickly accepted by the market due to the uncertainty involved with the added new features (Zhou and Nakamoto, 2007), it may eventually evolve into a more innovative product that are unique in the market. Companies are thus able to charge a higher price and gain additional customers. In the long run, the advantages of creative imitation will be reflected on the firm's financial performance, such as ROA (Lieberman and Montgomery, 1988; Zhou, 2006; Lee and Zhou,

2007; Wang et al., 2018). Lee and Zhou (2007) argued that both positivity and creativity influence financial performance differently and argued that creative imitation in particular appears to have greater impact on financial performance compared to pure imitation.

In summary, we expect that the pure imitation strategy exerts a stronger effect on the market performance, such as sales, while the creative imitation strategy will impact the firms' financial performance more. We adopted the research results of Liberman and Montgomery (1998), Zhou (2006), and Lee and Zhou (2007), Wang et al., (2018), and Moon and Acquaah (2020) to measure the hypotheses of pure and creative imitation. Pure imitation has a stronger positive impact on firm sales than creative imitation. Therefore, we hypothesizes:

*H1. Pure imitation has a stronger positive impact on firm ROA than creative imitation*

*H2. Creative imitation has a stronger positive impact on firm ROA than pure imitation*

## 2.2. Technology Capability

R&D investment has received significant attention from researchers as a key indicator of the overall level of innovation in companies (Xin et al., 2019). R&D investment is also used as a source of competitive advantage and technological advantage for better performance of the firm (James and McGuire, 2016; Ruiqi et al., 2017). A firms' technology capability refers to its acquired technological advantages and R&D investment. Technology-driven firms are more active in acquiring new technologies to develop new products that would reflect the changing needs of their customers (Berman and Hagan, 2006). In terms of resource-based and enterprise capabilities, enterprises' R&D investment and activities, generally measured by their R&D concentration, can be recognized as unique resources and capabilities, which are considered one of the key determinants of successful innovation (Anzola-Román et al., 2018). Numerous studies showed that there were positive relationships between R&D investment and firm performance (Branch, 1974; Cuneo and Marresse, 1984; Griliches, 1980; Hirschey and Weygandt, 1985; Hall and Bagchi-Sen, 2002). For example, Tubbs (2007) showed the higher the R&D intensity, the higher the sales and operating profits. In general, companies with a stronger technology capability are more likely to succeed in innovation (Kraasnikov and Jayachandran, 2008), which lead to superior firm performance (e.g., Song et al., 2005; Zhou et al., 2013). With a stronger technology capability, companies that adopt imitation strategies are more likely to invest in R&D and are more able to develop similar products as their competitors, and the imitated products are likely perform better in terms of functionality, as compared to companies with a weaker technology capability (e.g., Huang et al., 2010; Schewe, 1996), especially for the SMEs (Amin and Thrift, 1994). Ince et al., (2016) also argued that technology's "absorptive capacity" has a positive impact on technological innovation capability. Huang et al., (2010) argued that the core technological capacity of an imitative firm would certainly perform well in the industry. Wei et al., (2005) demonstrated that the performance of technological innovation is also determined by the core technological capacity. The imitation of technological innovation by enterprises is challenging, therefore, companies argue that it is strengthened by continuous indivisibility and organizational learning. Lestari and Ardianti, (2019), argued that technological capabilities must be well managed to achieve superior firm performance in a highly competitive market. Hitt et al., (2019) argued that diversification reduces the risk of R&D investments and creates the potential for entities to achieve higher returns on innovation. Thus, we have adopted the findings of Wei et al., (2005), Huang et al., (2010), Ince et al., (2016), and Lestari and Ardianti, (2019) to measure the hypotheses of technology capability. Therefore, we predict the positive effects of imitation, both pure and creative imitation, will be more pronounced when a firm has a stronger technology capability:

*H3. The stronger the firm's technology capability, the stronger the positive impact of imitation on firm performance, irrespective of pure or creative imitation.*

### 2.3. Competitive Intensity

Competitive intensity is defined as the degree of competition that firms encounter within the industry (Zhou, 2006). In a highly competitive environment, companies encounter pressure from a variety of sources, such as intensive price wars, high advertising investment, more product alternatives, and added services (Porter, 1980; Porter et al., 1985). As a result, companies also have a stronger motivation to reduce cost to gain competitive advantages (Gatignon and Xuereb, 1997; Porter et al., 1985), which may enhance their performance (Cadogan et al., 2003; Zhou, 2006; He and Nie, 2008). In comparison to companies that develop purely new products, which usually requires high investments in terms of R&D and marketing communication (Cooper, 1984a), companies that adopt an imitation strategy can reduce costs in new product development as they can easily copy the product from their competitors. Moreover, since existing products have already been on the market for a certain period of time, consumers may have already gained sufficient knowledge about such products. This is likely to make it easier for an imitated product to be accepted by the market, which further reduces the marketing efforts in educating consumers about the new products (e.g., Day and Wensley, 1988). Jaworski and Kohli (1993) addressed the importance of environmental factors in the relationship between market orientation and business performance. In contrast to the argument that the company's performance would be better (Huston, 1986) in the absence of competition, in a high competition situation, customers claimed that it might be detrimental to the entity as there were several options in purchasing the products they want and need (Kohli and Jaworski, 1990). Competitive intensity is a form of challenge for new ventures, and in an empirical analysis of 146 new entities in the United States, it argued that increasing competitive intensity reduces positive marketing capabilities in terms of performance (Zhang et al., 2020).

Ng'ang's et al. (2016) argued that competitive intensity plays a role in controlling the relationship between customer orientation and hotel performance in a survey of 330 managers using Resource-Based View (RBV). Zhang et al. (2019) conducted empirical analyses of 146 U.S. new ventures, arguing that increasing competitive strength reduces the positive effects of venture firms' marketing capabilities. In all, we predict that, as competition intensifies, the positive effect of imitation strategy on firm performance will increase. We adopted the research results of Cooper, (1984a); Day and Wensley, (1988), Jaworski and Kohli (1993), Zhou (2006), Ng'ang's et al., (2016), and Zhang et al., (2019) to measure the hypotheses of competitive Intensity. Therefore, we hypothesizes:

*H4. The stronger the competitive intensity, the stronger the positive impact on firm performance, irrespective of pure or creative imitation.*

### 2.4. Imitation Capability

Imitation capability has long been identified as a learning activity (Mukoyama, 2003). Mukoyama (2003) emphasized that many firms initiate business with imitation strategy and develop new technology based on the knowledge learned from other firms. Imitating capability is borrowing ideas from other companies and tying them together with one's creativity (Otuya, 2018). It is commonly believed that Samsung Electronics has become the world's leading semiconductor firm producing semiconductors independently after imitating and acquiring the technology of Japanese semiconductor firms in the early 1980s. Luo *et al.*,

(2011) proposed imitation capability after classifying it into combinative capability, hardship-surviving capability, absorptive capability, intelligence capability, and networking capability. In particular, Luo *et al.*, (2011) and Song (2015) asserted that absorptive capability shows an emerging economy copycats' distinctive ability to apply new knowledge. The stronger the imitation capability, the stronger the positive impact on firm performance. Latecomers use the imitation capability to access the technological frontier, which argues that companies' strategies should shift from imitation to innovation (Kim, 1997). Xia *et al.* (2018) argued that there was a mediating effect of imitation between foreign competition and local firm's innovation performance for UK companies. Finally, Houet *et al.* (2019) argued in a study of 143 Chinese venture firms that competition intensity plays a modification role between entrepreneurial orientation and firm performance. Wu *et al.* (2019) argued that imitation strategies are positively linked to innovation, and that imitation capabilities can be used as a process to reduce financial capital and technological obstacles typical of small businesses. We adopted the research results of Kim (1997), Mukoyama (2003), Luo *et al.*, (2011), Xia *et al.*, (2018), and Hou *et al.*, (2019) to measure the hypotheses of the imitation capability. Therefore, the following hypothesis is set.

*H5. The stronger the imitation capability, the stronger the positive impact on firm performance, irrespective of pure or creative imitation.*

### 3. Method and Data

Experiencing limited growth in Korea, Korean firms began to invest overseas since the early 1990s. Subsequently, major global players such as LG, Samsung, and Hyundai began to emerge in Korea. They invested overseas based on the benefits gained from the domestic market thanks to the Korean government's active export promotion policy. As mentioned by Goldstein *et al.*, (2006), they were becoming "Second-Wave MNEs." It is also true that SMEs have tried to advance overseas through linkage with the advancement of MNCs and achieved success. However, most Korean SMEs have entered other developing countries such as China by their own investment or joint venture investment rather than advancing through linkage with MNCs. These SMEs did not enter the overseas market with competitiveness in specific fields, such as capital, know-how, technology, and management ability, but advanced overseas due to the aggravated business environment such as strikes and a wage increase. Therefore, Korean SMEs that do not have competitiveness come to use the strategy of pure imitation of local and foreign firms' technology even after they enter China. Of course, some firms go beyond pure imitation, conduct business based on innovative imitation strategies, and successfully soft-land in China. However, most Korean SMEs are doing business in China without competitive advantage. According to Korea's import and export statistics (2015), investment in China reached 5.4 billion USD in 2007 when SMEs advanced to China, but declined from 2009 up to 3 billion dollars in 2014. In 2014, the number of SMEs' investment projects out of Korea's investment projects in China was 461,000 (48%) and the amount of investment was 460 million USD. These results verify the fact that Korean SMEs have lost their competitiveness because of intensified competition with local and foreign firms after entering China to take advantage of cheap labor costs. Korea, then, is a significant player in the SME sector of China and, as we shall see, there are further good reasons for us to select Korean firms for study. Note that our interest lies only in operational factors: we do not discuss any changes in the wider political landscape that may, in some cases, have an impact.

This study uses theoretical models presented by Liberman and Asaba (2006) and Delios *et al.* (2008) to reinforce the theoretical background. First, the study applies information-based

theories that firms imitate other firms because they have superior information than their own. For this reason, firms with superior technology are expected to exhibit better performance. This study uses technology capacity as a control variable to determine how this variable affects the management performance of copycat companies. Second, rivalry-based theories, which suggest that firms' imitation strategies limit rivalry or competitive parity depending on the degree of competition, are applied. Therefore, this study aims to investigate the impact of competitive intensity on performance. Competitive intensity is used as a control variable to determine how it affects the management performance of copycat companies. The imitation capability was established by referring to Kim (1997) and Mukoyama (2003), Luo et al., (2011), and Moon and Acquaah, (2020). Despite the existence of various environmental factors, we selected only three control variables, taking the aforementioned existing theories such as information-based theories and China's special competitive environmental factors into account. As China is a developing country where domestic and foreign companies compete fiercely, it is considered an environment where small and medium-sized enterprises with weak competitiveness have no choice but to consider the importance of technology, the strength of competition, and the ability to imitate it first.

For the empirical analysis, an initial survey of Korean firms conducting business for more than 10 years in China was performed by e-mail and telephone, through specialized research firms. We conducted a survey targeting department heads of each company who have more than 10 years work experiences. We assessed that the ability to gain trust and to access information from high-ranking informants would be greater if the firms were from the same country – Korea – as the lead researcher. The department heads answered the questions regarding imitation strategy, technology capability, and competitive intensity of corporate strategy. The department heads had worked for their firms for 12.5 years. We measured the degree of satisfaction using a five-point scale (1=strongly negative and 5=strongly positive) that measured their thinking about the survey questions. From September 15 to 25, 2018, 120 samples were obtained, representing a response rate of 50% (120 of 240 firms).

**Table 1.** Demographics Characteristics

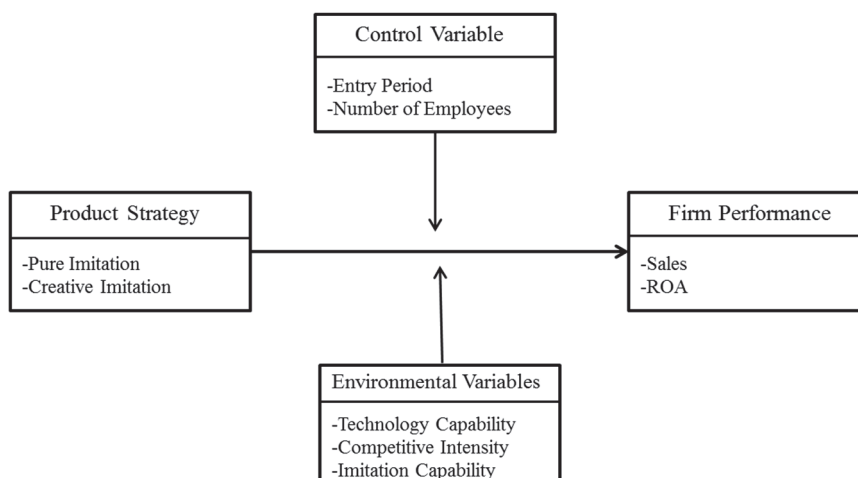
Division		Frequency	Ratio(%)
Form of Investment	Joint ventures	76	38
	Wholly owned	124	62
Industry Segment	Industrial products	128	64
	Electric products	26	13
	Machinery	16	8
	The others	30	15
Area	Shanghai City	76	38
	Shandong City	52	26
	Weihai City	44	22
	Yantai City	28	14

Considering the relatively large number of variables set in this study, a second questionnaire survey was conducted for 6 days from October 2 to 7, 2018 and additional 80 samples were obtained, representing a response rate of 66.6% (80 of 120 firms). Finally, a total of 200 highly reliable samples were obtained, which could effectively explain the nine variables set in the study. Of the 200 firms, 100% were small or medium sized, with 300 or fewer employees, and 62% had annual sales revenues of less than US\$ 9 million. 38% were



joint ventures and 62% were wholly owned companies. Among surveyed firms, the largest industry segment was industrial products (64%), followed by electric products (13%), machinery (8%), and the others (15%). Also, the data were collected in four cities (Shanghai City 38%, Shandong City 26%, Weihai City 22%, Yantai City 14%), each of which has more than 1,000,000 citizens.

**Fig. 1.** Research Model



Pure imitation and creative imitation represent a very effective product strategy when a firm replicates a competitive corporate's product. So, we measured firm's imitation performance using these variables based on previous studies (Schnaars, 1994; Lee and Zhou, 2012; Posen, 2013; Posen and Martignoni, 2018; Moon and Acquaah, 2020). And we considered technology capability, competitive intensity and imitation capability as environmental variables. Technology capability such as R&D investment is adapted since it has a critical role to firm's performance based on previous researches (Hall and Bagchi-Sen, 2002; Foster, 2003; Hitt et al., 2019). Competitive intensity represents the degree of competition that a firm faces in the industry, so we adapted this variable based on previous researches (Jaworski and Kohli, 1993; Zhou, 2006; Zhang et al., 2020). Imitation capability reflects useful corporate strategy to get competitiveness through a firm's imitation and acquisition based on previous researches (Kim, 1997; Mukoyama, 2003; Luo et al., 2011). Finally, we adapted firm performance from the previous studies (Kogut and Singh, 1998; Lee and Zhou, 2012). Firm performance is usually measured by the return on investment, the ordinary return, the operating profit, the profit margin, and so on (Jacobson, 1987; Ho and Wu, 2006; Hatem, 2014). Kogut and Singh (1998) argued that firm performance and R&D intensity were highly correlated and that a firm's R&D expenditure ratio had a positive impact on performance. Lee and Zhou (2012) used market share and ROA as key indicators to empirically analyze the impact of product imitation strategies (creative and pure) on firm performance. Zhou et al., (2013) also asserted that ROA to indicate firm performance because ROA, as a widely used firm performance measure, is not affected by the firms' decisions in equity evaluations. Based on the above, this study uses ROA and profit margins (for the last three years) as financial indicators to measure firm performance. We divided firm performance into two dependent variables. Sales represent sales performance and three year lagged ROA represents to seize financial per-

formance. We acquired the data on ROA from 2015 in 2017 when the data were completed available through the survey. We controlled Entry Period and Numbers of Employees as control variables. We measured entry period by the timing to enter Chinese market and number of employees as the number of locally employed employees in China. We used Korean firm's entry period to measure business experience in China since firms that have long business period could have a good performance, and we measured the number of employees as the firm size since the larger firms that have more employees have more management know-how and competitiveness.

#### 4. Analysis and results

Relevant hypotheses were tested using a hierarchical linear model (HLM). Table 1 shows the results. As a result of verifying through VIF, all of the multicollinearity that can occur among the explanatory variables appears to be less than five. Therefore, it can be seen that the control of the multicollinearity among the independent variables is effective. For financial performance, the sales and ROA are used as dependent variables in this study. Six models were constructed for each independent variable. First, Model 1 was constructed to see how control variables affect the sales, i.e., the dependent variable. Model 2 was built by adding the impact of product strategies and environmental variables on the sales, i.e., the dependent variable. Model 3 was constructed by adding interaction terms between product strategies and environmental variables. Finally, Models 4 to 6 were constructed with ROA set as the dependent variable in the same way as Models 1 to 3, in which sales were set as the dependent variable.

**Table 2.** Descriptive statistics of the constructs

Construct	1sale	2ROA	3PURE	4CRE	5TECH	6COMP	7ENTRY	8EMPL	9IMAT
1. Sale	1.00								
2. ROA	0.65***	1.00							
3. pure	0.41***		1.00						
Imitation		0.57***	0.85***						
4. Creative	0.37***			1.00					
Imitation		0.56***	0.20						
5. Technology	0.42***		0.02	0.24	1.00				
6. Competitive	-0.23	0.39***		-0.03	-0.13	1.00			
Intensity		-0.11	0.66***						
7. Entry Period	0.58***		0.38***	0.62***	0.44***	-0.20	1.00		
8. Firm	0.87***	0.55***		0.32***	0.34***	0.52***	0.52***	1.00	
Employee			-0.04						
9. Imitation	-0.01	0.53***		-0.00	-0.07	0.07	0.01	0.07	1.00
Capability	6218		3.33						
Mean	13072	-0.11	1.26	3.82	3.03	3.02	10.44	27.96	
Standard		5.44		1.18	1.29	1.46	6.64	45.20	3.41
deviation		4.44							1.16

**Notes:** sample size=200, \* $p < 0.01$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

In the estimation result, the coefficient of determination was 0.7842 in Table 1. In other words, 78% was explained by the change of factors considered in the regression model. The sign and significance of coefficient estimates were considered to accurately reflect the changes

in sales. In particular, the coefficient estimate of the entry period had a significant positive (+) sign, indicating that the longer the business history, the greater the firm sales. The number of employees had a significant positive sign (+), indicating that the greater the number of employees, the higher the firm sales.

The coefficient of determination was 0.3359 in Model 2. In other words, 34% is explained by the change of factors considered in the regression model. The sign and significance of coefficient estimates were considered to accurately reflect the sales changes. In addition, the coefficient of determination was 0.4291 in Model 5. In other words, 43% is explained by the change of factors considered in the regression model. Thus, the sign and significance of the coefficient estimates were considered to accurately reflect the ROA changes. The coefficient estimate of pure imitation had a significant positive (+) sign in Model 2, indicating that pure imitation had a positive impact on firm sales. On the other hand, the coefficient estimate of creative imitation had an insignificant negative (-) sign, indicating that creative imitation did not have a positive impact on firm sales. Creative imitation was not statistically significant. As a result of comparing the T-test values, pure imitation was estimated to be 2.52 and creative imitation was estimated to be -0.42. Therefore, it was confirmed that pure imitation had a stronger impact on the sales than creative imitation. Therefore, Hypothesis 1 was supported. On the contrary, Hypothesis 2 was not supported because creative imitation had no significant impact on sales.

The coefficient estimate of technology capability had a significant positive (+) sign in Model 2, indicating that technology capability had a positive impact on firm sales. The coefficient estimate of technology capability had a significant positive (+) sign in Model 5, indicating that technology capability had a positive impact on ROA as in Model 2. The result of testing Hypothesis 3 showed that the better the firm's technology capability, the stronger the positive impact on firm performance, irrespective of pure or creative imitation. Therefore, Hypothesis 3 was supported. On the other hand, the coefficient estimate of competitive intensity had an insignificant negative (-) sign, indicating that competitive intensity had no positive impact on firm sales. Therefore, Hypothesis 4 was rejected. Imitation capability was estimated to have a positive (+) sign in Model 2, indicating that imitation capability had a positive impact on sales. However, it was not statistically significant. Therefore, Hypothesis 5 was rejected.

The results of the analysis on moderation of environmental variables in the impact of pure and creative imitation on the sales and ROA were as shown in Models 3 and 6. It was observed that pure imitation had a significant positive (+) impact on sales through its interaction with technology capability in Model 3, indicating that there was a moderation effect. Moreover, pure imitation had an insignificant negative (-) impact on sales through its interaction with competitive intensity. On the other hand, creative imitation had a significant positive (+) impact on sales only through its interaction with competitive intensity. Furthermore, pure imitation had a significant positive (+) impact on ROA through its interaction with competitive intensity in Model 6, indicating that there was a moderation effect.

**Table 3.** Model 1

Variable	Estimate	t-value	Approx. Pr> (t)
Intercept	-3814	-3.30	0.0014
Entry	360	-3.30	0.0013
Emp	224	14.01	0.0001

Dependent variable: sales; R-Square: 0.7842

**Table 4.** Model 2

Variable	Estimate	t-value	Pr> (t)
Intercept	-11444	-1.96	0.0535
Pure Imitation	4303	2.52	0.0133
Creative Imitation	-760	-0.42	0.6790
Technology Capability	3346	3.78	0.0003
Competitive Intensity	-1854	-2.42	0.0172
Imitation Capability	492	0.52	0.6061

Dependent variable: sales; R-Square = 0.3359 F = 11.95

**Table 5.** Model 3

Variable	Estimate	t-value	Pr> (t)
Intercept	-2949	-1.06	0.2926
Technology capability × pure imitation	2468	2.47	0.0155
Technology capability × creative imitation	-1213	-1.32	0.1900
Competitive intensity × pure imitation	-2639	-2.72	0.0077
Competitive intensity × creative imitation	1765	2.07	0.0413
Imitation capability × pure imitation	1279	1.30	0.1963
Imitation capability × creative imitation	-775	-0.86	0.3904

Dependent variable: sales; R-Square = 0.4376 F = 12.06

**Table 6.** Model 4

Variable	Estimate	t-value	Approx.Pr>(t)
Intercept	1.8602	2.82	0.0059
Entry	0.2538	4.08	0.0001
Emp	0.0333	3.64	0.0004

Dependent variable: ROA; R-Square = 0.3924

**Table 7.** Model 5

Variable	Estimate	t-value	Pr> (t)
Intercept	-2.47226	-1.35	0.1810
Pure Imitation	1.32888	2.49	0.0146
Creative Imitation	0.64716	1.13	0.2624
Technology Capability	0.89755	3.24	0.0017
Competitive Intensity	-0.24126	-1.01	0.3166
Imitation Capability	-0.28780	-0.96	0.3371

Dependent variable: ROA; R-Square = 0.4367 F = 14.58

**Table 8.** Model 6

Variable	Estimate	t-value	Pr> (t)
Intercept	-2948	-1.06	0.2926
Technology capability × pure imitation	2468	2.47	0.0155
Technology capability × creative imitation	-1212	-1.32	0.1900
Competitive intensity × pure imitation	-2639	-2.72	0.0077
Competitive intensity × creative imitation	1764	2.07	0.0413
Imitation capability × pure imitation	1278	1.30	0.1963
Imitation capability × creative imitation	-775	-0.86	0.3904

Dependent variable: ROA, R-Square = 0.4376 F = 12.06

## 5. Discussion and Conclusions

Different from Lee and Zhou (2012), this study concluded that pure imitation, rather than creative imitation, had a stronger positive impact. In other words, this study concluded that pure imitation had a stronger positive impact on firm performance than creative imitation. Lee and Zhou (2012) argued that unlike in developed countries, imitation strategies in transition economies such as China played an important role in market share and performance as core strategies of firms. However, through a further empirical analysis in transition economies, such as China, it was found that not all creative imitation strategies had a positive impact on firm performance. Because the empirical analysis focused on foreign SMEs in China, some results might be different. However, the reason the study concluded that pure imitation had a stronger positive impact on financial performance than creative imitation was because the foreign SMEs in China were influenced by the external environment, such as changes in the Chinese government policy, and because their technology level was low.

In addition to Lee and Zhou (2012), few previous studies empirically analyzed the impact of pure and creative imitation on firm performance. Nevertheless, empirical research on how useful the imitation strategy is in developing economies and whether it has a positive impact on firm performance is still lacking. We confirm in several papers that imitation strategies are still very useful, especially those that are very necessary for survival and development for later companies with weak skills (Valdani and Arbore, 2007; Lee et al., 2016; Tsolakidis et al., 2020). Therefore, this study attempts to empirically analyze the impact of pure and creative imitation strategies on firm performance through their interaction with environmental variables composed of technology capability, competitive intensity, and imitation capability to fill the gap in the literature.

The findings suggest that SMEs' technology level also had a positive impact on performance. Firms with better technology had a positive impact on performance, irrespective of pure or creative imitation. This reflects the cases where many Korean SMEs entering China without high technology level lose their competitiveness due to Chinese firms' technology catch-up within a short period of time. Therefore, foreign SMEs can maintain their competitiveness if only they enter China with definitely better technology level compared to the local firms. However, it can be argued that this is also a short-term basis and that continuous technology innovation is required.

It must be a huge challenge for SMEs to conduct business in transition economies such as China. While the business difficulties experienced by Western and Asian firms may be different, it seems clear that Asian firms have a competitive advantage in terms of China's labor policy changes, personnel management, and so on. However, the difficulty commonly experienced by all foreign firms conducting business in China is that Chinese firms adopt imitation strategy very broadly and catch up with the latest technology quickly. Therefore, foreign SMEs with medium- and low-level technology entering China to conduct business are likely to lose their short-lived competitiveness and eventually withdraw from China. Therefore, foreign SMEs entering China should constantly strive for technology innovation.

In addition, SMEs that lack technology and know-how need to focus on pure imitation strategies. It is possible that SMEs can perform creative imitation, but it seems difficult under the current circumstances. Therefore, SMEs with limitations in technology and know-how should maintain their competitive advantage for a while, by maintaining their pure imitation strategy. If their technology is caught up by Chinese firms, it would be advisable for them to look for new business opportunities in a third region where labor and other costs are comparatively low. Otherwise, these SMEs will eventually fail.

## 6. Implications

For firms that lack financial resources and technology development skills, imitation strategy is one of the most important growth strategies. Through an empirical analysis, this study found that pure imitation plays a very important role in the growth of foreign SMEs in China. This study provides theoretical implications from several perspectives. First, although imitation strategies are attracting attention in the literature, only a few studies such as Lee and Zhou (2012) empirically measured which imitation between pure or creative had a significant impact on firm performance. In order to compete with foreign firms in the emerging market, local firms grow through learning and imitation strategies. As Zhou (2006) argued, it is true that firms' new products with innovation strategy are more successful than those with imitation strategy. However, for CEOs of SMEs with no technology innovation ability, imitation is a very suitable strategy that provides the foundation for their growth, such as financial resources and technology ability (Efendi et al., 2020). This study demonstrated empirically that imitation strategy was one of the product strategies for firms to easily choose, especially for SMEs, and that choosing pure imitation rather than creative imitation led to better firm performance. There was lack of research on which imitation between pure or creative had a significant impact on firm performance.

The theoretical contribution of this study is that it shows that pure imitation has a stronger impact on firm performance. Second, pure imitation only had a statistically significant positive impact on firm performance among imitation strategies in this study, unlike the findings of Zhou (2012). In other words, creative imitation is not very easy for SMEs to choose in the emerging market like China. Firms must focus on enhancing performance by choosing pure imitation which allows them to copy other firms easily without much financial investment. These results are contrary to papers that claim that creative imitation is one of the most useful management strategies for companies and is also very effective in improving their business performance (Lee et al., 2016; Wang et al., 2019). In addition, pure imitation had a positive impact on firm performance through its interaction with the environment variables such as technology capability and competitive intensity. As a result of verifying the interaction effects between environmental variables and pure and creative imitation variables, the pure and creative imitation strategies showed similar results as the empirical analysis results above. Unlike the predictions, imitation capability was not statistically significant. In general, the better the imitation capability, the better the firm performance. However, different results were obtained in this analysis. It can be seen that imitation strategy alone had its limitations, as it was not long before Chinese firms caught up with foreign firms' low technology level, even though the latter had strong performance for a certain period of time after entering China.

## 7. Limitations

This study solely focused on Korean SMEs for empirical analysis. Therefore, there is a limit to the general application of this study to SMEs from other countries that have entered China. The theoretical and practical implications suggested in this study are also derived from Korean SMEs that have entered China. More sophisticated results could be obtained about how much more impact imitation had on the foreign investment firm performance if more variables were considered, such as the Chinese government's frequent policy changes and the Chinese economy's uncertainty in addition to the environmental variables. Future research must consider these points.

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