

Performance implications of combining creative and imitative innovation strategies

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Abstract:

Purpose: The purpose of this study is to investigate the performance effects of pure innovation strategies (creative and imitative) versus the combination of the two innovation strategies (combination innovation strategy) and to determine whether implementing the combination innovation strategy produces an incremental performance benefit over the pure innovation strategies. **Design/methodology/approach:** We used archival data from the Korea Innovation Survey (KIS) completed by a large sample of South Korea manufacturing firms and some financial data provided by the South Korea Science and Technology Policy Institute (STEPI). We used hierarchical multiple regression analysis to analyze the data from 486 firms. **Findings:** The findings indicated that firms implementing any of the three innovation strategies of creative innovation, imitative innovation and combination innovation outperforms noninnovators. Results also show that while firms implementing the combination innovation strategy perform better than those implementing imitative innovation strategies, they do not significantly differ in performance from firms implementing the creative innovation strategy. Moreover, we find no performance difference between creative innovation and imitative innovation strategies. **Practical implications:** The study highlights the importance of combination innovation strategies for manufacturing firms that rely on imitative innovation strategies to gain competitive advantage in the market. However, it demonstrates that firms that are successful in using creative innovation strategies must use their resources in exploiting that advantage. **Originality/value:** Although extant studies have demonstrated the importance of both creative innovation and imitative innovation strategies in enhancing performance, it is not clear whether implementing both strategies at the same time has incremental value for firms. This study focusses on empirically examining the performance implications of creative innovation and imitative innovation strategies, and whether the pursuit of a combination innovation strategy (simultaneous pursuit of both innovation strategies) provides any incremental benefit is unique.

Keywords: creative innovation | imitative innovation | combination innovation strategy | firm performance

Article:

1. Introduction

Innovation has been a central concern to both academic researchers and managerial practitioners because it is considered a critical source of sustainable competitive advantage and superior performance for firms. A firm implementing an innovation strategy typically introduces a new product or service to the market which enables it to earn first-mover and preempting advantages and monopolistic profits (Lee *et al.*, 2000; Lieberman and Montgomery, 1988, 1998). Although such pioneering advantages and profits for the innovating firm may be eroded by competitors' imitations, it is generally accepted that innovation strategy is superior to imitation strategy. The superiority of innovation strategy in creating competitive advantage and earning superior profits has been well-documented and empirically supported by traditional innovation research (Bach *et al.*, 2019; Chatzoglou and Chatzoudes, 2018; Damanpour and Evan, 1984; Turulja and Bajgoric, 2019). On the other hand, imitation strategy has been negatively viewed and relatively underrated (Posen *et al.*, 2013; Schewe, 1996). Those authors taking the negative view of imitation strategy assume that imitation is not only simple and easy but does not provide firms with sustainable competitive advantage because it allows a firm to take just a piece of the original innovator's pioneering profits. Although the literature on innovation strategy has assumed that imitation strategy is inferior to innovation strategy, researchers have also pointed out that imitation can be a viable strategic option to innovation.

Levitt (1966), one of the pioneering researchers on imitation, argued that imitation strategy represents a more prevalent form of new product development and leads to firm growth and increase in profits over innovation strategy. Since innovation strategy is highly risky and entails a substantial amount of development costs, “watchful waiting” (Levitt, 1966) as an imitation strategy, may be a better strategic choice for firms that seek to gain a competitive advantage through cost efficiency and risk minimization (Zhou, 2006). Some empirical studies have also demonstrated that innovative activities or strategies do not necessarily enhance firm performance (e.g. Roberts and Amit, 2003). Thus, innovation strategy is not the only strategic choice for product development, but in some cases imitation strategy, whereby firms exploit the innovator's pioneering efforts in new product development, may be a better strategic option that allows firms to experience better performance than being the first-mover or pioneer in the market (Mothe and Nguyen-Thi, 2010; Zhou, 2006).

Recent strategy researchers have emphasized that imitation strategy is more complex than what previous literature has assumed and firms pursuing the imitation strategy may outperform firms implementing the innovation strategy depending on the content and characteristics of their imitation strategies. These researchers view imitation as a fundamental part of the competitive process and a deliberate or proactive strategic choice to reduce risks and costs that innovators inevitably incur in pursuing an innovation strategy (Csaszar and Siggelkow, 2010; Giachetti *et al.*, 2017; Lieberman and Asaba, 2006; Ordanini *et al.*, 2008; Posen and Martignoni, 2018; Posen *et al.*, 2013). Thus, it seems desirable to regard both innovation and imitation strategies as viable competitive strategic options for firms to gain and sustain their competitive positions in the market (Naranjo-Valencia *et al.*, 2011). In line with this viewpoint, researchers have identified imitative innovation as a viable innovation strategy at the intersection between innovation and imitation in contrast with creative or original innovation (Brouwer and

Kleinknecht, 1999; Garcia and Calantone, 2002; Huang *et al.*, 2010; Sadowski and Sadowski-Rasters, 2006; Wang *et al.*, 2019).

Imitative innovation strategy means that the imitator does not simply copy the original innovator's product attributes or practices but creatively reconfigures or recombines them with its own distinctive characteristics. Following Levitt's (1966) seminal work on creative imitation, a limited number of researchers have been examining the characteristics and efficacy of imitative innovation strategy at the conceptual level. Those studies point out that an imitative innovation strategy is a viable strategy and may provide firms with competitive advantage as much as a creative innovation strategy. Researchers have also focused on comparing imitative innovation and creative innovation and as a result view the two innovation strategies as mutually exclusive. However, some researchers have asserted that the two innovative strategies should be viewed as complementary and not mutually exclusive and that a strategy that balances the exploitation of both strategies should be implemented by a firm depending on its market needs and corporate objectives (Levitt, 1966; Hobday *et al.*, 2004). Levitt (1966) emphasized that every company needs a balanced view of innovative leadership and fast followership to be successful in its market since no single company can afford to be the first-mover or pioneer in every market. Hobday *et al.* (2004) have demonstrated that the innovation strategies of South Korean firms involve the use of both low cost catch-up as a type of imitative innovation strategy and leadership in new product development as a creative innovation strategy.

In a different context, the idea of the complementary or synergistic benefits from using the combination of multiple innovation strategies has been embraced in the recent innovation literature emphasizing the importance of simultaneously adopting technological (product and process) and nontechnological (organizational and marketing) innovations (Anzola-Román *et al.*, 2018; Azar and Drogendijk, 2014; Ballot *et al.*, 2015; Battisti and Stoneman, 2010; Damanpour *et al.*, 2009; Evangelista and Vezzani, 2010; Lee *et al.*, 2019; Sapprasert and Clausen, 2012; Tavassoli and Karlsson, 2016). For instance, Ballot *et al.* (2015) found that the combined use of both product innovation and organizational innovation increased the performance of French firms using Community Innovation Survey (CIS) data. Lee *et al.* (2019) have shown that the synergistic effects of product innovation and marketing innovation enhance the performance of high-tech firms, while the combination of process innovation and organizational innovation improves performance for low-tech firms in South Korea. Tavassoli and Karlsson (2016) also show that using a complex innovation strategy, which combines two or more of four innovation types of product, process, marketing and organizational, tends to enhance future labor productivity than a simple innovation strategy adopting only one of the four innovation types.

Furthermore, since both creative and imitative innovations have their own merits and demerits (Zhou, 2006), it would be desirable for firms to simultaneously pursue these two innovation strategies to maximize their competitive advantage and performance. Therefore, we posit that combining these two innovation strategies may enable a firm to earn additional performance benefits over firms relying purely on either creative innovation strategy or imitative innovation strategy. While some previous research examined the performance effects of innovation versus imitation strategies (e.g. Zhou, 2006) or technological leadership versus followership (Salomon and Jin, 2010; Zhang and Park, 2014), prior research has failed to empirically examine the

performance implications of both imitative and creative innovation strategies. This is especially true when empirically examining the performance impact of simultaneously pursuing creative and imitative innovation strategies. Furthermore, no study has investigated whether the use of a strategy which combines both creative and imitative innovation strategies (henceforth called a combination innovation strategy) yields an incremental performance benefit over each of the singular innovation strategies.

To fill the research gap noted above, we empirically examine the performance effects of each of the two innovation strategies and a combination innovation strategy. We further examine whether the implementation of the combination innovation strategy produces an incremental performance benefit over the singular innovation strategies. We posit that the implementation of a combination innovation strategy would result in multiple sources of competitive advantage (e.g. as first-mover benefits from creative innovation and spillover effects from imitative innovation due to learning and knowledge transfer) (Salamon and Jin, 2010; Zhang and Park, 2014) as compared to advantages gained from the pursuit of singular innovative strategies.

We examine our research questions by using South Korean manufacturing firms as our empirical setting. South Korean firms provide an ideal context to study the performance implications of the three innovation strategies (creative, imitative and combination) because the ability to implement creative and imitative innovation strategies in a balanced way is critical in generating competitive advantage in several manufacturing industries. The South Korean economy is still in the transition phase of moving from a low-cost catch-up competitiveness to a technological innovation leadership phase (Hobday *et al.*, 2004; Oh *et al.*, 2015). Although South Korea has recently been considered as moving away from a newly industrialized economy (NIE) to a developed economy, most of the companies in South Korea are experiencing the strategic dilemma of whether to continue with their long-standing imitative innovation strategy of low cost catch-up or take a bold step of pursuing creative innovation strategies (Hobday *et al.*, 2004; Oh *et al.*, 2015). Specifically, we use data drawn from the Korea Innovation Survey (KIS) to empirically test our hypothesized relationships. KIS, which was conducted and released by the Science and Technology Policy Institute (STEPI) in South Korea, represents a large-scale national survey covering more than 8,000 firms distributed across diverse industries in both manufacturing and service sectors. The survey data captures diverse innovation activities and strategies pursued by South Korean firms. Furthermore, since the core questions in the KIS are based on the CIS questions from the Organisation for Economic Co-operation and Development's (OECD's) Oslo Manual (2005), the results of this research may be comparable with the findings of similar studies across OECD countries (Mol and Birkinshaw, 2009).

2. Theory and hypotheses

2.1 Theoretical background

Building on the pioneering work of Levitt (1966) and its subsequent studies, researchers have identified two different types of innovation strategies: creative innovation and imitative innovation strategies (Garcia and Calatone, 2002; Huang *et al.*, 2010; Sadowski and Sadowski-Rasters, 2006; Wang *et al.*, 2019). Creative innovation strategy is defined as engaging in a pioneering activity to develop and introduce a new product or service first in the market (Kim

and Nelson, 2000). The concept of creative innovation is well-reflected in the *novelty* aspect, which Schumpeter (1934) emphasized in his definition of innovation. It is widely accepted and sufficiently explored in prior literature that creative innovation provides firms with sustainable competitive advantages which enable them to earn superior performance (Kim and Nelson, 2000; Shenkar, 2010).

Imitative innovation strategy, on the other hand, is not simply copying the original innovator's product attributes or practices but creatively reconfiguring or recombining them in distinctive ways. It is synonymous with what Wang *et al.* (2019) call “creative imitation” strategy. It is a strategy “whereby the entrant creatively combines imitated aspects of the incumbent's original product with its own innovative characteristics to create a distinct offering typically offered at a competitive lower price” (Wang *et al.*, 2019, p. 2). It is distinct from pursuing a duplicative imitation strategy by firms which involve manufacturing knock-off products by closely copying an original innovator's products and selling them as a different brand (Kim, 1997; Kim and Nelson, 2000). Duplicative imitation strategy does not provide firms with sustainable competitive advantage but confers competitive edge only through pricing advantages (Kim and Nelson, 2000). Imitative innovation strategy differs from duplicative imitation in its content and characteristics. Imitative innovation strategy includes diverse methods such as reverse engineering, benchmarking, transfer of best practices, technological leapfrogging (Lee and Lim, 2001), and more complex types of imitation involving the leveraging of idiosyncratic and tacit knowledge to improve upon the product attributes (Reed and DeFillippi, 1990). Therefore, imitative innovation strategy may not be as simple and easy as classical organizational and strategy theorists have assumed about imitation.

Recent research suggests that due to the incomplete and complex processes involved in imitating the best performing firm's practices or original products, the “copy-the-best” (Posen *et al.*, 2020, p. 178) imitation strategy may increase interfirm performance heterogeneity rather than lead to the convergence of the performance of such imitators and the original innovators (Posen *et al.*, 2013; Posen and Martignoni, 2018). It has been argued that in some cases, firms pursuing imitative innovation strategy may outperform firms pursuing creative innovation strategy through a better recombination or reconfiguration of product attributes along with active investment in R&D activities such as can be seen in the success of Japanese manufacturing firms in the global market (Bolton, 1993; Kim and Nelson, 2000).

As compared to creative innovation strategy, the performance implications of imitative innovation strategy have been much less researched (Garcia and Calatone, 2002; Huang *et al.*, 2010; Wang *et al.*, 2019). Most of the studies examining the efficacy or performance effects of imitative innovation strategy have been done at the conceptual level or through case analyses or experiments (e.g. Huang *et al.*, 2010; Wang *et al.*, 2019). Furthermore, previous studies on creative and imitative innovations have focused on comparing the two innovation types with each other in terms of their efficacy or performance implications but failed to examine the complementary effects accruing from simultaneously pursuing the two innovation strategies (Hobday *et al.*, 2004; Kim and Nelson, 2000; Levitt, 1966). Since both creative and imitative innovation strategies have their own advantages and disadvantages, it may not be effective for firms to rely solely on one of them to compete in an industry. Both creative and imitative innovation strategies are needed to generate and sustain an innovative leadership in some product

areas as well as to catch up with pioneering leaders in other product areas for firms to maintain and sustain competitive edge. This is because even the global corporate giants cannot afford to become first in everything in their market domains (Hobday *et al.*, 2004; Levitt, 1966). Therefore, the major contribution of this research is to empirically examine the additional performance effects of pursuing a combination innovation strategy over creative and imitative innovation strategies in addition to directly testing the performance effects of the combination innovation strategy over noninnovating firms based on actual published data.

2.2 Hypotheses

2.2.1 *Creative innovation vs imitative innovation*

Creative innovation, also referred to as original, real or true innovation (Brouwer and Kleinknecht, 1999; Garcia and Calatone, 2002; Sadowski and Sadowski-Rasters, 2006), represents the launching of a new product, service or process to the market by a firm before its competitors. On the other hand, imitative innovation, which is also referred to as creative or innovative imitation (Kale and Little, 2007; Kim and Nelson, 2000; Levitt, 1966; Wang *et al.*, 2019), connotes innovation that is only new to the firm introducing the new product, service or process though it is already available from its competitors in the market (Huang *et al.*, 2010; Wang *et al.*, 2019). Therefore, imitative innovation indicates the application of an innovation that has already been created in another organization. The superiority of creative innovation in engendering firm competitiveness and performance has been well-recognized and supported by prior empirical research (Lieberman and Montgomery, 1988). Firms engaged in creative innovation, typically characterized as first-movers, gain sustainable competitive advantage through factors such as technological leadership, preemption of scarce market resources and customer loyalty (Lieberman and Montgomery, 1988).

Although research has also noted disadvantages such as changes in technology or customer needs and incumbent or organizational inertia that first-movers may incur in the process of creative innovation, the innovation literature is clear about the superiority of creative innovation strategy over other types of innovation strategies. Creative innovation strategy is considered as an important strategic option for moving toward the innovation frontier especially by firms in transition economies such as South Korea (Hobday *et al.*, 2004). Based on the accumulated prior learning, through collaboration with global technological leaders and active R&D investments, leading South Korean firms in the semiconductor, mobile phone and automobile industries such as Samsung Electronics and Hyundai Automobile have been successfully developing innovative products and emerging as major rivals to established companies in global markets (Kale and Little, 2007). The success experienced by these South Korean firms have become a model for many other South Korean firms that have been trying to successfully develop innovative products for their markets to gain sustainable advantage and earn superior performance, oftentimes with the aid of government support.

While creative innovation has made more contributions to sustaining competitive advantage than imitative innovation, researchers have stressed that most firms engage in innovations which are imitative in nature, and the contributions of imitative innovation should not be underrated (Garcia and Calantone, 2002; Huang *et al.*, 2010; Levitt, 1966). Recent research has begun to

provide empirical evidence about the important role imitative innovation plays in a firm's competitiveness and performance (Wang *et al.*, 2019). Imitative innovators, who are usually considered second movers or fast followers, seek to gain a competitive advantage and improve performance by reducing or avoiding substantial development and testing costs (Lieberman and Montgomery, 1988). Therefore, imitative innovation can be regarded as efficiency-based and risk-minimizing innovation strategy. Imitative innovation can also serve to reshape the industry landscape when early movers that are locked-in to their mainstream customers ignore changes in customer needs and preferences. This may allow imitative innovators to overtake creative innovators with their improved product performances (Cho *et al.*, 1998).

Imitative innovation has been used as an important source of competitive advantage and superior performance by firms in Asian countries such as South Korea, China, Japan and India (Wang *et al.*, 2019). Imitative innovators aim at generating a distinctive product or service offering normally at a competitively lower price by creatively mixing a subset of the incumbent firm's innovative attributes with their own distinctive characteristics through such practices as benchmarking and reverse engineering (Wang *et al.*, 2019). Imitative innovation is, thus, a prevalent form of innovation strategy used by a considerable number of South Korean firms to gain a competitive advantage and superior performance. However, many leading South Korean companies are also moving toward the innovation frontier based on their activities in new product development and active in-house research and development (R&D) (Oh *et al.*, 2015; Hobday *et al.*, 2004). Previous research has reported how major South Korean companies successfully implemented technological catching-up or leapfrogging in their industries or markets through in-depth case studies (Cho *et al.*, 1998; Hobday *et al.*, 2004; Lee and Lim, 2001). Thus, South Korean firms that implement both the creative innovation and imitative innovation strategies would experience improvement in their performance. Thus, we provide the following hypotheses:

H1. Firms implementing creative innovation or imitative innovation strategies will perform better than noninnovating firms.

H2. There will be no difference in performance between firms implementing creative innovation strategy and those implementing imitative innovation strategy.

2.2.2 Combination innovation strategy

As stated earlier, since creative innovation and imitative innovation strategies have their own advantages and disadvantages, it may not be effective for firms to rely solely on one of the two innovation strategies. It may be desirable that those two different types of innovation strategies should be viewed as complementary, rather than mutually exclusive in promoting the firm's sustainable competitive advantage. Regarding this, Levitt (1966) suggested that a balanced view of innovation and imitation is needed for every company to be successful in its market. "Every company needs to recognize the impossibility of sustaining innovative leadership in its industry and the danger of an unbalanced dedication to being the industry's innovator. No single company, regardless of its determination, energy, imagination, or resources, is big enough or solvent enough to do all the productive first things that will ever occur in its industry and to

always beat its competitors to all the innovations emanating from the industry” (Levitt, 1966, p. 65).

Adopting an imitative innovation strategy by firms implementing a creative innovation strategy will enable those firms to minimize or reduce risk and R&D costs which they may incur by focusing on first-mover advantages and pioneering profits from creative innovation. Imitative innovation strategy may also provide post-imitation learning benefits which may be different from the knowledge from their creative innovative activities (Salomon and Jin, 2010; Wang *et al.*, 2019; Zhang and Park, 2014). On the other hand, pursuing a creative innovation strategy by firms implementing an imitative innovation strategy may help them obtain technological leadership and pioneering market positions which they normally lack in the process of seeking risk reduction and cost economization. Therefore, the combination of the two innovation strategies, when properly planned and implemented, may enable firms to secure their competitive position and edge over their competitors in their markets. The combination of the two innovation strategies may also increase innovation capabilities of the firms via cumulative learning because it would enable them to acquire multifaceted bundles of skills and knowledge bases that could be used for the different types of innovation activities (Arranz *et al.*, 2019; Lee *et al.*, 2019).

The critical importance of such combination innovation strategy of simultaneously pursuing creative innovation and imitative innovation was well-depicted in prior research dealing with a so-called “strategic dilemma” between catch-up innovation and new product development confronted by South Korean firms, which have been reported in the popular business press, media and policy circles in South Korea (Oh *et al.*, 2015; Hobday *et al.*, 2004). Hobday *et al.* (2004) argued that the strategic dilemma viewpoint or dichotomy overly simplified and incorrectly captured the way South Korean firms conducted their innovation strategic activities. This is because the strategic dilemma simply focused on comparing catching-up or imitative innovation with creative innovation as mutually exclusive strategic options. Hobday *et al.* (2004) further pointed out that the innovation strategies of South Korean firms that are transitioning to the innovation frontier leveraged both low cost catch-up and leadership in new product development by deploying in-house R&D capabilities to provide “a portfolio of products, some of which are technologically advanced and others less advanced” (p. 1,433) . Consequently, they suggested that an innovation strategy should be implemented by taking into consideration a firm's specific product or market needs and its corporate strategic purposes.

Recent studies focusing on different types of innovations such as product, process, marketing, technological and organizational innovations have revealed that firms pursuing more than one type of innovation at the same time perform better than those that pursue only one type of innovation at a time (Arranz *et al.*, 2019; Ballot *et al.*, 2015; Lee *et al.*, 2019; Tavassoli and Karlsson, 2016). Thus, we present the following hypotheses:

H3. Firms implementing a combination innovation strategy will perform better than noninnovating firms.

H4a. Firms implementing a combination innovation strategy will perform better than those implementing a creative innovation strategy.

H4b. Firms implementing a combination innovation strategy will perform better than those implementing an imitative innovation strategy.

3. Methods

3.1 Sample and data

The empirical analysis for this research uses innovation data from the 2014 KIS manufacturing sector database and financial (sales) data from the STEPI in South Korea. The KIS data are from a survey of a large sample of South Korean manufacturing firms with 10 employees or more for the period 2011 to 2013 and cover diverse aspects of the innovation activities of those manufacturing firms. The total number of firms which took part in the survey and provided data on innovation-related activities and factors was 4,077. Among the 4,077 firms, 486 firms provided financial data on sales and product innovations, which were relevant to this study and were therefore used as the sample for this research study. One of the strengths of the KIS is that it gathers data from large samples of firms which are representative of a wide range of manufacturing industries in South Korea (See Table 1). Lee *et al.* (2019) have used the KIS data to investigate the synergistic effects of innovation on performance. Furthermore, the KIS is based on the format of the OECD's Oslo Manual (2005) and is similar to the CIS of OECD countries, so the conceptual definitions and measurements of the innovation-related variables and factors used for the statistical analysis in this study follow the method and procedure in the Oslo Manual. Therefore, the empirical results from this research may be compared with findings of similar studies using the CIS data across OECD countries (Mol and Birkinshaw, 2009).

3.2 Measurement of variables

3.2.1 Firm performance

Sales was used as a measure of firm performance in this study because it was the only performance measure that was included in the KIS. Sales performance has been widely used as a measure of performance in innovation studies since it reflects the market impact due to the innovation activities of firms (Arranz *et al.*, 2019; Lee *et al.*, 2019; Oh *et al.*, 2015; Yam *et al.*, 2004, 2011). Specifically, we used the 2013 sales as a measure of performance because the KIS collected data from the manufacturing firms from 2011 to 2013. Moreover, this research investigates the performance effects of the innovation strategies the firms implemented during the three years from 2011 to 2013. We considered the use of 2013 sales performance to capture the lag effects of the innovation activities of the prior two years (2011 and 2012). We also used the sales of the firms for 2014 as an additional performance measure to examine the lag effect of the innovation activities on firm performance. We measured firm performance as the natural logarithm of the sales for 2013 and 2014 which were calculated in hundred million units in Korean won.

3.2.2 Innovation strategies

The KIS include questions that distinguish between product innovations that are new to the market and those that are only new to the firm. We considered a firm as pursuing a *creative*

innovation strategy if the firm answered “yes” to the question of whether they introduced products that were new to the market during the period 2011 to 2013. *Creative innovation strategy* was operationalized as a dummy variable coded as 1 for firms which answered “yes” to introducing products that were new to the market from 2011 to 2013 and 0 otherwise. We considered a firm as pursuing an *imitative innovation strategy* if the firm answered “yes” to the question of whether they introduced products that were only new to the organization (but not the market) for the period 2011 to 2013. *Imitative innovation strategy* was operationalized as a dummy variable coded as 1 for firms which answered “yes” to introducing products that were only new to the firm from 2011 to 2013 and 0 otherwise. Previous research (Brouwer and Kleinknecht, 1999; Sadowski and Sadowski-Rasters, 2006) distinguished between creative and imitative innovation and operationalized them in the same way.

Furthermore, this study identified a *combination innovation strategy*. We considered a firm to be pursuing a combination innovation strategy if it answered “yes” to both questions (i.e. introduced products new to the market and new to the firm simultaneously). We operationalized *combination innovation strategy* as a dummy variable coded 1 for firms that answered “yes” to both the questions measuring *creative innovation* and *imitative innovation strategies* simultaneously and 0 otherwise. Finally, we considered a firm as not pursuing an innovation strategy or *noninnovation strategy* if it answered “no” to both questions measuring *creative innovation* and *imitative innovation* and it was operationalized as a dummy variable coded 1 and 0 otherwise. Our study sample consists of 51 firms pursuing *creative innovation strategy*, 259 firms pursuing *imitative innovation strategy*, 121 firms pursuing a *combination innovation strategy* and 55 *noninnovation strategy* firms. The sample distribution indicates that the imitative innovation strategy represents a more prevalent form of innovation strategy for South Korean firms.

3.2.3 Control variables

We controlled for firm age, R&D intensity, collaboration, patent protection and industries in order to account for their effects on sales performance. *Firm age* was operationalized as the natural logarithm of the number of years elapsed from the year of the company's inception to the end of the year of the survey. *R&D intensity* was measured as the ratio of the firm's R&D personnel to its total full-time employees in 2013. *Collaboration* is measured as a dummy variable coded 1 if the firm collaborated with other firms or organizations on product or process innovation activities and 0 otherwise. *Patent protection* was operationalized as a dummy variable coded 1 if the firm registered a patent to protect a product or process innovation during the period 2011 to 2013 and 0 otherwise. This research also included industry dummies to control for the effects of diverse industries on the firms' sales performance. The KIS originally classified the industry affiliations of the manufacturing firms which participated in the survey into 23 industries, but in this study, we reclassified them into 10 industries by assigning industries with similar characteristics to the same category. Table 1 shows the base industry (comparison group) and the manufacturing industries representing each of the industry dummies and their Korean Standard Industry Classification Codes (KSICs) used in the analysis. The base industry was chosen based on the highest frequency of firms among the ten industry classifications. Each of the other nine industry classifications were operationalized as a dummy variable coded 1 if a firm belongs to the corresponding industry classification and 0 otherwise.

Table 1. Industry dummy variables and affiliated industries used in the regression analysis

Industry dummies	Affiliated industries (KSIC)	Count
Ind1	Food (10); Beverages (11)	44
Ind2	Fabric products (13); Clothes, garment accessories and fur products (14); Leather, bags and shoes (15)	25
Ind3	Lumber and wooden products (16); Pulp and paper products (17); Printing and publishing (18)	9
Ind4	Cork, coal and petroleum refined products (19); Chemicals and chemical products (20); Medical substances and medicine (21); Lubber and plastic products (22)	75
Ind5	Nonmetallic mineral products (23)	11
Ind6	Primary metals (24); Fabricated metal products (25)	48
Ind7	Electronic parts, computers, video, acoustic and communication devices (26); Medical, precision, optical instruments and watches (27)	95
Base industry	Electronic equipment (28); Other machinery and equipment (29)	120
Ind8	Automobile and trailers (30); Other transportation equipment (31)	50
Ind9	Furniture (32); Other products (33)	9
Total		486

4. Results

Table 2 presents the descriptive statistics and correlations among the variables. The correlations show significant relationships between the independent variables and firm performance (sales in both 2013 and 2014). Notable among them is the very high correlation between firm size and sales in both 2013 and 2014. There are also significant correlations among the innovation strategy variables, but none of them raised multicollinearity problems or concerns since none of the variance inflation factors (VIFs) of the innovation strategy variables was greater than 2.00. The results of the hierarchical regression analyses are shown in Tables 3 and 4. Due to the unusually high correlations between firm size and sales (0.86 for 2013 and 0.87 for 2014), firm size was excluded from the regression analyses. Since firm size is usually measured by either number of employees or sales (Camisón-Zornoza *et al.*, 2004; Child, 1973; Kimberly, 1975), we considered firm size to be redundant because sales is used as a dependent variable in this study.

Models 1A and 1B show the results of regressing sales performance on control variables. Models 2A and 2B show the results of regressing sales performance on the control variables and the innovation strategy dummy variables of creative innovation, imitative innovation and combination innovation compared to noninnovation strategy. The results in Models 2A and 2B show that firms pursuing creative innovation, imitative innovation and combination innovation strategies experienced positive sales in 2013 and 2014 compared to noninnovative firms. The results imply that the implementation of those three innovation strategies of creative innovation, imitative innovation and combination innovation has the potential to increase firm sales even after controlling for the age of the firm, R&D intensity, collaboration on innovative activities with other organizations and patent protection, providing support for Hypotheses 1 and 3.

Table 2. Descriptive statistics and correlation matrix of variables

Variables	1	2	3	4	5	6	7	8	9	10	11
(1) Sales in 2013 (Log)											
(2) Sales in 2014 (Log)	0.98										
(3) Creative innovation ^a	-0.01	-0.03									
(4) Imitative innovation ^b	-0.09	-0.10	-0.37								
(5) Combination innovation ^c	0.24	0.25	-0.20	-0.62							
(6) Noninnovation ^d	-0.18	-0.16	-0.12	-0.38	-0.21						
(7) Firm size ^e	0.86	0.87	-0.02	-0.08	0.26	-0.21					
(8) Firm age ^f	0.36	0.34	-0.03	-0.04	0.14	-0.10	0.37				
(9) R&D intensity	-0.09	-0.09	0.05	-0.01	-0.03	-0.00	-0.11	-0.17			
(10) Collaboration	0.24	0.23	0.01	-0.13	0.19	-0.07	0.25	0.15	0.10		
(11) Patent protection	0.13	0.15	0.09	0.08	0.11	-0.10	0.17	0.04	0.15	0.14	
<i>N</i>	486	486	51	259	121	55	486	486	486	486	486
Mean	6.38	6.42	0.10	0.53	0.25	0.11	5.15	3.00	0.14	0.48	0.64
Standard deviation	1.45	1.43	0.31	0.50	0.43	0.32	1.10	0.61	0.14	0.50	0.48
Minimum	2.58	2.95	0.00	0.00	0.00	0.00	2.40	1.39	0.00	0.00	0.00
Maximum	11.76	11.98	1.00	1.00	1.00	1.00	9.27	4.50	0.80	1.00	1.00

Note(s): Significance levels: For $r > 0.08$, $p < 0.05$; $r > 0.12$, $p < 0.01$

^aDummy variable coded 1 for firm pursuing only Creative Innovation and 0 otherwise

^bDummy variable coded 1 for firms pursuing only Imitative Innovation and 0 otherwise

^cDummy variable coded 1 for firms pursuing both Creative and Imitative Innovations and 0 otherwise

^dDummy variable coded 1 for firms pursuing neither Creative nor Imitative Innovation and 0 otherwise

^eLog of Number of Employees

^fLog of the Age of firms in years

Table 3. Performance differences between different innovation strategies (DV = Log sales 2013)^{a,b}

Variables	Model 1A	Model 2A	Model 3A	Model 4A	Model 5A
Constant	3.75 (0.34)**	3.41 (0.37)**	3.89 (0.44)**	3.90 (0.64)**	3.80 (0.39)**
Firm age (Log)	0.67 (0.10)**	0.63 (0.10)**	0.64 (0.12)**	0.57 (0.18)**	0.67 (0.11)**
R&D Intensity	-0.64 (0.49)	-0.63 (0.46)	-0.55 (0.53)	-0.50 (0.82)	-0.51 (0.54)
Collaboration	0.48 (0.12)**	0.39 (0.12)**	0.32 (0.15)*	0.73 (0.21)**	0.39 (0.14)**
Patent protection	0.38 (0.13)**	0.31 (0.13)*	0.16 (0.16)	0.44 (0.25)+	0.30 (0.15)*
Industry dummies	Included	Included	Included	Included	Included
Creative innovation		0.61 (0.25)*			
Imitative innovation		0.47 (0.20)*			
Combination innovation		0.97 (0.21)**			
Creative vs imitative ^c			0.16 (0.19)		
Combination vs creative ^d				0.24 (0.22)	
Combination vs imitative ^e					0.49 (0.15)**
Adjusted R^2	0.21	0.28	0.19	0.23	0.26
F	10.60**	10.36**	5.56**	5.02**	8.82**
Sample size (N)	486	486	310	172	380

Note(s): Significance levels: ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$

^aThe reported coefficients are unstandardized coefficients. Standard errors are in parentheses. Combination, creative and imitative innovations are compared against non-innovation

^bLog of firm size (number of employees) is omitted from the regression analysis because it is highly correlated with Log of sales for both 2013 and 2014. It should be noted that Log of number of employees and Log of sales are both used to represent firm size

^cDummy variable defined as follows: Creative Innovation = 1, Imitative Innovation = 0

^dDummy variable defined as follows: Combination Innovation = 1, Creative Innovation = 0

^eDummy variable defined as follows: Combination Innovation = 1, Imitative Innovation = 0

Table 4. Performance differences between different innovation strategies (DV = Log sales 2014)^{a,b}

Variables	Model 1B	Model 2B	Model 3B	Model 4B	Model 5B
Constant	3.49 (0.35)**	3.59 (0.36)**	4.05 (0.44)**	3.83 (0.62)**	3.88 (0.39)**
Firm age (Log)	0.65 (0.08)**	0.59 (0.10)**	0.60 (0.12)**	0.56 (0.18)**	0.62 (0.11)**
R&D intensity	-0.70 (0.45)	-0.73 (0.45)	-0.63 (0.53)	-0.78 (0.82)	-0.56 (0.53)
Collaboration	0.42 (0.12)**	0.35 (0.12)**	0.28 (0.15)+	0.63 (0.21)**	0.34 (0.14)*
Patent protection	0.42 (0.13)**	0.36 (0.13)**	0.21 (0.16)	0.54 (0.25)*	0.37 (0.14)**
Industry dummies	Included	Included	Included	Included	Included
Creative innovation		0.46 (0.25)+			
Imitative innovation		0.39 (0.20)*			
Combination innovation		0.89 (0.22)**			
Creative vs Imitative ^c			0.10 (0.19)		
Combination vs creative ^d				0.32 (0.22)	
Combination vs Imitative ^e					0.51 (0.15)**
Adjusted R ²	0.23	0.27	0.18	0.23	0.26
F	10.78**	10.12**	5.32**	5.20**	8.74**
Sample size (N)	486	486	310	172	380

Note(s): Significance levels: ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$

^aThe reported coefficients are unstandardized coefficients. Standard errors are in parentheses. Combination, creative and imitative innovations are compared against noninnovation

^bLog of firm size (number of employees) is omitted from the regression analysis because it is highly correlated with Log of sales for both 2013 and 2014. It should be noted that Log of number of employees and Log of sales are both used to represent firm size

^cDummy variable defined as follows: Creative Innovation = 1, Imitative Innovation = 0

^dDummy variable defined as follows: Combination Innovation = 1, Creative Innovation = 0

^eDummy variable defined as follows: Combination Innovation = 1, Imitative Innovation = 0

Models 3A and 3B show the results of testing the performance differences between creative innovation and imitative innovation strategies. In these models, the dummy variable is coded as 1 for firms pursuing the creative innovation strategy and 0 for firms pursuing the imitative innovation strategy. Hypothesis 2 states that there will be no performance difference between firms implementing a creative innovation strategy and those implementing an imitative innovation strategy. The results in Models 3A and 3B indicate that although the estimated coefficients are both positive for both 2013 and 2014, they are not significantly related to performance. These results indicate that the sales performance of firms implementing the imitative innovation strategy do not significantly differ from those implementing the creative innovation strategy, providing support for Hypothesis 2.

Models 4A, 4B, 5A and 5B provide the results of testing the incremental performance benefits of implementing the combination innovation strategy over the pure innovation strategies (creative and imitative), as presented in Hypotheses 4a and 4b. Each regression model shows the regression of sales performance on the control variables and a dummy variable comparing two innovation strategies. In these regression models, the coefficients of the dummy variable indicate whether there exist significant differences in performance between the two innovation strategy groups.

In Models 4A and 4B, the dummy variable is coded as 1 for firms pursuing the combination innovation strategy and 0 for firms pursuing the creative innovation strategy. Hypothesis

4a posits that firms implementing a combination innovation strategy will outperform those implementing the creative innovation strategy. As can be seen from Models 4A and 4B, although the coefficients of the dummy variables are positive for sales performance in 2013 and 2014, they are not statistically significant. The results indicate that the performance of firms pursuing the combination innovation strategy does not significantly differ from the performance of firms pursuing the creative innovation strategy. Hypothesis 4a is, therefore, not supported. In Models 5A and 5B, the dummy variable is coded as 1 for firms pursuing the combination innovation strategy and 0 for firms pursuing the imitative innovation strategy. Hypothesis 4b posits that firms implementing a combination innovation strategy will outperform those implementing an imitative innovation strategy. The coefficients of the dummy variable in both models are positive and statistically significant, which indicates that firms pursuing a combination innovation strategy outperform those implementing an imitative innovation strategy. Thus, Hypothesis 4b is supported.

5. Discussion and conclusion

5.1 Discussion and implications

Based on a typology of creative innovation versus imitative innovation strategies, this study empirically investigated the performance effects of the two innovation strategies and the combination strategy of the two innovation strategies. The study further examined whether implementing the combination innovation strategy produces an incremental performance benefit over the pure innovation strategies. Unlike most of the previous research that has focused on contrasting imitative innovation with creative innovation and viewing those innovation strategies as mutually exclusive, our research considered those two innovation strategies as complementary rather than mutually exclusive. As a result, we identified a combination innovation strategy which involved simultaneously pursuing both the creative innovation and imitative innovation strategies. Using data from 486 manufacturing firms who completed the KIS, we find that firms implementing any of the three innovation strategies of creative innovation, imitative innovation and combination innovation outperform noninnovators. Thus, the results from our overall sample provide support for the viability of those three innovation strategies. The findings are consistent with studies that extol the benefits of creative innovation (Bach *et al.*, 2019; Damanpour and Evan, 1984; Damanpour *et al.*, 2009), imitative innovation (Wang *et al.*, 2019), and the synergistic (Lee *et al.*, 2019) or combinative effects of different types of innovation (Arranz *et al.*, 2019; Ballot *et al.*, 2015; Doran, 2012; Tavassoli and Karlsson, 2016).

The focus of our research is that a significant incremental performance benefit will be conferred on firms pursuing the combination innovation strategy over those pursuing pure creative innovation and imitative innovation strategies. This is because the combination innovation strategy benefits from creative innovation strategy in the form of first-mover advantage and technological leadership (Wang *et al.*, 2019) and imitative innovation strategy, which includes spending less on R&D and gaining from postimitative experiential learning (Salomon and Jin, 2010; Zhang and Park, 2014). The results reveal that there exists a significant performance benefit to firms pursuing the combination innovation strategy over the imitative innovation strategy but not over those pursuing the creative innovation strategy. This result implies that although the imitative innovation strategy represents a more prevalent form of innovation

strategy for most of the South Korean manufacturing firms, relying solely on such an imitative innovation strategy would not create value. Since imitative innovation strategy seeks to gain a competitive advantage through cost efficiency and risk minimization, firms using this strategy may gain limited competitive advantage in this highly competitive global environment when compared with firms pursuing the combination innovation strategy. Such efficiency-based imitative innovation strategy may have to be supplemented with creative innovation strategy in order to secure its viability and sustainable competitiveness. The finding that there is an incremental performance difference between the pursuit of the combination innovation strategy and the imitative innovation strategy is consistent with some of the studies using CIS data from Europe (Arranz *et al.*, 2019; Tavassoli and Karlsson, 2016). However, these studies using CIS data from Europe focused on combining technological and nontechnological innovations versus either a single technological or nontechnological innovation.

On the other hand, the results show that firms pursuing a creative innovation strategy in the South Korean economy may not experience any incremental performance benefit by combining it with an imitative innovation strategy. This result implies that it may be more desirable for those South Korean firms successfully implementing a creative innovation strategy to concentrate purely on creative innovation rather than to divert their efforts to a dual focus on creative and imitative innovations. Importantly, such a single focus on creative innovation by those South Korean firms may confer on them technological leadership which may be a model for other South Korean firms and thus encourage them to move away from their long-lasting catch-up and imitative strategies toward the innovation frontier.

Our analyses also show that there is no difference in performance between firms implementing a pure creative innovation strategy and those implementing a pure imitative innovation strategy. In line with prior research stressing both innovation strategies as viable strategic options (e.g. Levitt, 1966; Huang *et al.*, 2010; Wang *et al.*, 2019), this result indicates that none of the pure innovation strategies (creative innovation and imitative innovation) engenders superiority over the other in terms of sales performance. Since creative innovation and imitative innovation possess their own merits and demerits, it seems to make more sense to analyze the performance differences between those two innovation strategies based on a contingency perspective rather than a universal perspective. Thus, future research needs to compare the performance differences between creative innovation and imitative innovation strategies using some relevant contingency factors such as an individual firm's resources and capabilities endowments and environmental conditions. It is also worthwhile to note that collaboration is significant and positively related to firm performance in all regression models. This finding suggests that South Korean firms need to collaborate with other relevant firms or organizations on innovation activities to enhance their performance in this highly competitive global business environment.

This study makes the following distinctive contributions to strategic management and innovation research. First, this research provides an empirical examination of performance effects of both creative innovation and imitative innovation strategies using a dataset from the KIS. Unlike research on creative innovation, most of the studies regarding the efficacy or performance effects of imitative innovation have been conducted in a limited way at the conceptual level or through case analyses or experiments (e.g. Huang *et al.*, 2010; Wang *et al.*, 2019). Although previous research have examined the performance effects of innovation strategies versus imitation

strategies (e.g. Zhou, 2006), to the best of our knowledge, no prior research has empirically examined the performance implications of both imitative innovation and creative innovation strategies.

The second major contribution of this research is the empirical examination of the incremental performance benefits of a combination innovation strategy (simultaneously pursuing creative innovation and imitative innovation strategies), in addition to directly testing the performance effects of the combination innovation strategy over noninnovating firms. Our study contributes to the scanty literature on the implications of combining different innovation strategies by providing new empirical evidence on the efficacy of the complementarity between creative innovation and imitative innovation strategies on performance. Previous research has focused on contrasting imitative innovation with creative innovation and viewed those two innovation strategies as mutually exclusive, and thus has failed to identify a combination innovation strategy of simultaneously pursuing those two innovation strategies. As a result, to date none has empirically tested the performance impact of simultaneously pursuing creative innovation and imitative innovation strategies. Furthermore, we have not found any study that has investigated whether the use of such combination innovation strategy yields an incremental performance benefit over each of the singular innovation strategies.

The idea of the complementary or synergistic benefits from using the combination of multiple innovation strategies is not new to the innovation literature but has recently been empirically investigated in the innovation literature. The empirical research have emphasized the importance of simultaneously pursuing technological innovation (product and process) and nontechnological innovation (organizational and marketing) innovations (Anzola-Román *et al.*, 2018; Battisti and Stoeman, 2010; Azar and Drogendijk, 2014; Ballot *et al.*, 2015; Damanpour *et al.*, 2009; Evangelista and Vezzani, 2010; Lee *et al.*, 2019; Sapprasert and Clausen, 2012; Tavassoli and Karlsson, 2016). However, these studies have been conducted in a different context using a different typology of technological versus nontechnological innovation. Therefore, this research examining the performance implications of combining creative and innovative innovation strategies is unique by using a different innovation typology and framework when compared with previous innovation studies.

5.2 Conclusion

In this study, we examined the incremental performance benefits of implementing a combination innovation strategy over the singular innovation strategies of creative innovation and imitative innovation. We also examined the relative performance benefit of creative innovation over imitative innovation. Using the KIS dataset from South Korea, the study revealed that implementing a combination innovation strategy is not always beneficial than pursuing singular innovation strategies. Our findings suggest that manufacturing firms in South Korea that are implementing the imitative innovation strategy may derive superior performance benefits by complementing it with the pursuit of creative innovation strategy. Thus, the learning accumulated by a firm through its imitative innovation strategy should be leveraged in introducing new products to their market to increase its performance. However, for firms implementing the creative innovation strategy it may be better for them to focus their attention and resources in solidifying their initial advantage. They could do this by using their lead-time

advantages to develop the capabilities to blunt competitors' ability to imitate their innovations and to entrench their leadership in the market. We hope that this paper has contributed positively to the debate on the performance implications of the complementarity of implementing different innovation types by extending previous studies.

5.3 Limitations and future research

Before accepting the results of our research as conclusive, the following limitations should be noted with caution for future research. First, this study employed a dichotomous measure for operationalizing creative innovation and imitative innovation strategies. It is relatively well-established in the innovation literature to conceptualize and operationalize creative innovations and imitative innovations as innovations that are “new to the world” and innovations that “are new to the firm” (but not to the market), respectively (Brouwer and Kleinknecht, 1999; Garcia and Calantone, 2002; Huang *et al.*, 2010; Sadowski and Sadowski-Rasters, 2006). However, the dichotomous measure may not be able to adequately capture the multifaceted characteristics of the innovation constructs (Damanpour, 1996). Moreover, the use of dichotomous variables does not allow us to understand all the nuances underlying the findings, which may be captured by specific items used to derive the constructs. Given the absence of well-established multidimensional measurements of creative innovation versus imitative innovation in previous studies, future research needs to develop such a multidimensional measure for better capturing those innovation constructs.

Second, this study used a universal approach to empirically examine the performance effects of the different innovation strategies. As indicated in the empirical findings, there seems to be no superiority in firm performance between creative innovation and imitative innovation strategies. Thus, future research needs to analyze the performance differences between those two innovation strategies based on the contingency perspective. For example, under what contingency factors do firms implementing a creative innovation strategy perform better than those performing an imitative innovation strategy and vice versa? Future research should be able to answer this research question.

Third, another limitation of this study comes from using only sales as a measure of firm performance. Although sales performance is a widely used measure of technological innovation and financial performance in the innovation literature, it does not cover the aspect of profit as another crucial measure of firm performance. The limited financial data availability in the KIS did not allow us to incorporate other performance measures such as profits into our empirical analysis. Furthermore, while our study captured the lag effects of the innovation activities on sales performance spanning two years, the longer period of time covered by the financial data may enable us to better check the long-lasting effects of the innovation strategies on firm performance.

Finally, the empirical results of this research are based solely on data from South Korea, which may be limited in extending its generalizability to other economic settings such as Western developed countries. Although specifically the data from KIS we used for the empirical analyses may represent unique characteristics in South Korean industries and firms, the KIS following the format of the OECD's Oslo Manual (2005) is comparable to the CIS of OECD. As noted earlier,

a number of recent studies have examined the complementary or synergistic effects between technological and nontechnological innovations on firm performance using CIS or KIS data (Anzola-Román *et al.*, 2018; Azar and Drogendijk, 2014; Ballot *et al.*, 2015; Battisti and Stoneman, 2010; Evangelista and Vezzani, 2010; Lee *et al.*, 2019; Sapprasert and Clausen, 2012; Tavassoli and Karlsson, 2016). Moreover, some of the research using CIS data have examined the relationship between foreign ownership and development of imitative versus creative (real) innovation strategies (Sadowski and Sadowski-Rasters, 2006). However, these studies did not empirically examine the performance effects of imitative versus creative innovation strategies and a strategy combining both creative and imitative innovation strategies using the CIS data. Therefore, future research needs to replicate the empirical analyses conducted in this study using CIS data to compare with the results of this research.

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