

THE EFFECTS OF THE INNOVATION TYPES OF VENTURE FIRMS AND GOVERNMENT SUPPORT ON FIRM PERFORMANCE AND NEW JOB CREATION: EVIDENCE FROM SOUTH KOREA

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ABSTRACT

Innovative venture firms have contributed to the economy by achieving good financial performance and creating new jobs in the labour market. In this process, the government has played crucial roles in building an entrepreneurial environment and financially supporting the venture firms. This research aims to explore how the innovation activities of venture firms and government support affect firm performance and new job creation. A total of 488 venture companies in South Korea were selected to test the hypotheses of this study. Results indicate that marketing and managerial innovations, as well as government support, play positive roles as the key elements for good firm performance and new job creation. Technological innovation, however, exhibits notable positive effects on new job creation, although it was not significantly related to firm performance. The theoretical contributions and practical implications of this research are discussed based on the results.

Keywords: Innovation Types, Government Support, Firm Performance, New Job Creation, South Korea

INTRODUCTION

The innovation activities of venture firms play a significant role in achieving the economic progress of their countries (Baldwin & Picot, 1995; Lichtenthaler & Lichtenthaler, 2009; McWilliams & Siegel, 2001). However, venture firms lack physical and human resources compared with large corporations; thus, government can support venture firms to overcome financial setbacks (Lerner, 1999; McWilliams & Siegel, 2001).

Previous studies have shown that innovative activities of firms are likely to exert positive influence on the economic performance of firms and new job creation (Bogliacino & Pianta, 2010; Herzog, 2011; Greenan & Guellec, 2000; Kwon, Park, Ohm & Yoo, 2015; Song & Chen, 2014). In particular, new job creation has been deemed one of the most indispensable factors of the economic growth of a country (Bogliacino & Pianta, 2010; Dencker, Gruber & Shah, 2009) because it contributes to solving unemployment problems and establishing a sustainable socioeconomic system (Broersma & Gautier, 1997; Kirchoff & Phillips, 1988). Numerous venture firms have utilized innovation strategies and have played key roles in creating new jobs (Baldwin & Picot, 1995). A number of studies deal with the relationship between innovation and

the key success factors of firms (i.e., firm performance and new job creation) in the Western business context, however, only a few studies have analysed the subject using Asian cases.

South Korea achieved rapid economic growth from the 1960s until the onset of the 1997–1998 Asian financial crisis (Choi, Dobbs, Suh, Mischke, Chon, Cho, Kim & Kim, 2013). In this process, the Korean government established innovation policies and initiated plans to enhance firm performance and employment creation (Harvie & Pahlavani, 2006; Sengupta & Espana, 1994). In other words, the government supported the development of major industries by setting up favourable environment. The government still presents various support plans for firms to facilitate innovation. Government support, a representative public support for firms especially at early stages (Lee & Bae, 2008), positively affects the firms' investment in innovation (Garcia & Mohnen, 2010). Despite the importance of government support for private-sector innovation, the effects are under investigated yet.

This study explores how the innovative activities of South Korean venture firms and government support affect firm performance and new job creation. Understanding these mechanisms is critical to the aim of driving national economic growth and enhancing the competency of firms (Davis, Haltiwanger & Schuh, 1996; Hohti, 2000; Lotti, 2007). The rest of this paper is organized as follows. Section 2 analyses the theoretical background and formulates hypotheses. Section 3 presents the research design. Section 4 provides the results based on the empirical analysis. Lastly, Section 5 discusses the practical implications and academic contributions, as well as the future research direction.

THEORETICAL BACKGROUND & HYPOTHESES

The Effects of the Innovative Activities of Firms on Performance and New Job Creation

Innovation activities are defined as the mechanism for diversifying scientific ideas and outcomes into commercial results, products, and performance (Schotchmer, 2006). Ultimately, these activities positively affect the value creation of firms, specifically in such aspects as cost reduction, sharing of the latest technology and the implementation of efficient processes (Cainelli, Evangelista & Savona, 2004, 2006). In addition, innovation activities are regarded as a driving force for economic performance and job creation (Kwon et al., 2015; Rosenberg, 2004). Prior research has shown that diverse types of innovation can substantially influence firm performance and new job creation (Wright, Gilligan & Amess, 2009). Job creation is a key component of corporate social responsibility (Husted & Allen, 2006). Firms can obtain social legitimacy by fulfilling social responsibility such as job creation. Social legitimacy is important for venture firms because they are likely to acquire resources from the environment.

In general, innovation activities are classified into three types, namely, technological, marketing and managerial innovations (Kwon et al., 2015; Van Reenen, 1997).

First, technological innovation is regarded as one of the main methods to enhance firm performance and initiate radical change. In addition, technological innovation is considered a ground-breaking activity in creating new modules, products, and processes (Dachs & Peters, 2014; West & Farr, 1989). Prior studies have considered technological innovation as an important determinant that affects the performance of venture firms and new job creation (Romijn & Albaladejo, 2002; Souitaris, 2002). In the past, possessing advanced knowledge was already sufficient to elevate a firm to a high growth level. However, current information and communication technology develops and changes rapidly. Thus, as the amount of refined

technology and the number of products rapidly increase, firm performance (Kim & Park, 2010) and new employment creation in most business areas are positively affected (Edquist, Hommen & McKelvey, 2001; Fagerberg, Mowery & Nelson, 2006; Pianta, 2000). Accordingly, universities and research institutions supply skilled people to meet the talent demands of venture firms (Antonucci & Pianta, 2002). These studies have been used as a basis to predict that technological innovation has positive effects on firm performance and new job creation.

Hypothesis 1: Technological innovation is positively related to firm performance.

Hypothesis 2: Technological innovation is positively related to new job creation.

Marketing innovation is the extent to which firms enhance their marketing management activities, pricing policy, and guiding service plan for consumers (Williams, 1999). At present, venture companies gain value by interacting with customers and sharing user-oriented information through marketing management. The purpose of marketing innovation activities is to collect the creative ideas of consumers to upgrade products and services (Karat, 1996). Venture firms consistently want to rapidly adapt to the changing environment, gain consumer information, and respond to customer demands (Gunday, Ulusoy, Kilic & Alpkan, 2011). The feeling of connection of consumers to the marketing activities of venture firms can be positively related to the intent to enhance firm performance and employment creation (Becker & Dietz, 2004; Bryson, Rubalcaba & Ström, 2012; Preece, 1993). By integrating information with user-oriented strategies and reacting immediately to consumer demands in dynamic environments, venture firms can increase the resources of their competencies by selecting new talents and employees. Lee, Park, Yoon & Park (2010) proposed that marketing innovation, including user-centered strategies, improves firm performance in South Korea. Previous studies have indicated that many leading innovative firms have attempted to gain these competitive outcomes by expanding their organizational teams and selecting additional new employees (Hienerth, von Hippel & Jensen, 2014; Karat, 1996). Thus, marketing innovation is predicted to positively affect firm performance and new job creation.

Hypothesis 3: Marketing innovation is positively related to firm performance.

Hypothesis 4: Marketing innovation is positively related to new job creation.

Managerial innovation encompasses activities that are designed to provide and determine the competitive advantage of the human resources of an organization (Agyris & Schon, 1978). From the perspective of organizational management, managerial innovation is used to adapt the competencies of a firm to the competitive environment that is associated with the firm's innovative capability; hence, undertaking managerial innovation will enable the organization to build innovation performance systems by implementing various organizational policies or activities (Hayes, Pisano and Upton, 1996).

Managerial innovation activities offer several advantages, such as (1) differentiated cost reduction, (2) on-going transformation and the potential to interact with rapidly changing environments, and (3) performance-oriented supervision with immediate response to changes in the market (Brown & Eisenhardt, 1997; Henderson & Clark, 1990; Mezias & Glynn, 1993). Rapidly changing environments and technological development approaches have added to the challenges faced by organizational management practices. Many firms can acquire resources and knowledge of the how-to, what, and why of significant innovation trends regardless of their environmental boundary size (Crossan & Apaydin, 2010; Lewin & Volberda, 1999). In addition, managerial innovation is known to have positive influences on firm performance (Cornelli & Karakas, 2008; Guo, Hotchkiss & Song, 2011). Several studies have suggested that managerial

innovation, including financial investment, improves firm performance, particularly by enabling the recruitment of talented human capital to engage in firm innovation strategies (Bosma, Van Praag, Thurik & De Wit, 2004; Huselid, 1995). This logic is used as basis to postulate the following hypotheses.

Hypothesis 5: Managerial innovation is positively related to firm performance.

Hypothesis 6: Managerial innovation is positively related to new job creation.

Government Support, Firm Performance and Job Creation

According to resource dependence theory, organizations should acquire critical resources from the external environment to survive (Pfeffer & Salancik, 1978). Venture firms also depend on resources that originate from the environment in order to invest in innovation because they are likely to lack resources especially at early stages (Lee & Bae, 2008). R&D and innovation can be considered as public goods as the outcome benefits the society as a whole rather than a few individual firms. Therefore governments' support for R&D investment is one of the most influential factors in sustaining the growth of venture firms (Lee & Bae, 2008; McWilliams & Siegel, 2001). Most previous studies have investigated the factors that affect firm performance and job creation (Antonucci & Pianta, 2002; Bogliacino & Pianta, 2010; Kang & Park, 2012; Pianta, 2000). Many government institutions have linked support programs with the growth of firms, such as those that are aimed at enhancing the willingness to incorporate firm performance and new employment creation (Lerner, 1999; McWilliams & Siegel, 2000). Therefore, an attempt is made to add to the literature by analysing how government support is related to firm performance and new job creation. Government support is conducted using public support programs to enhance the sustainable growth and financial performance of venture companies (Dollar & Sokoloff, 1990; Howe & Mcfetride, 1976).

The prior literature on government support states that R&D expenditure is a key engine of national companies (Howe & Mcfetride, 1976). Government support is also an important factor that affects firm performance, R&D efficiency, and new employment (Alchian & Demsetz, 1972; Klenow, 1996; Levy & Terleckyj, 1983). Since the 1980s, several studies have supported the link between government support programs and new job creation (Dollar & Sockloff, 1990; Oakey, 1983; Lerner, 1999). Government policies allow swift capability, convenient creation of employment, and convenient access to external resources for venture companies through program-based support networks that are available anytime and anywhere. That is, government polices related to job creation positively affect new employment growth (Neumark, Wall & Zhang, 2011).

Many venture firms prefer to share knowledge and resources by interacting with government institutions. Government programs serve as an efficient environment for interacting with other firms; competent people and venture firms can substantially benefit from interactive networks that are based on support programs. Moreover, connectedness with government support contributes to the creation of new employment (Birch, 1987; Erickson & Friedman, 1990). Previous research has also demonstrated that support policies of national governments positively influence firm performance (Erickson & Friedman, 1990; World Bank, 1993). Therefore, the present study uses the findings of prior research on the effects of government support to propose the following hypotheses.

Hypothesis 7: Government support is positively related to firm performance.

Hypothesis 8: Government support is positively related to new job creation.

The Proposed Research Model

Based on the study hypotheses, the following research model is suggested (Figure 1).

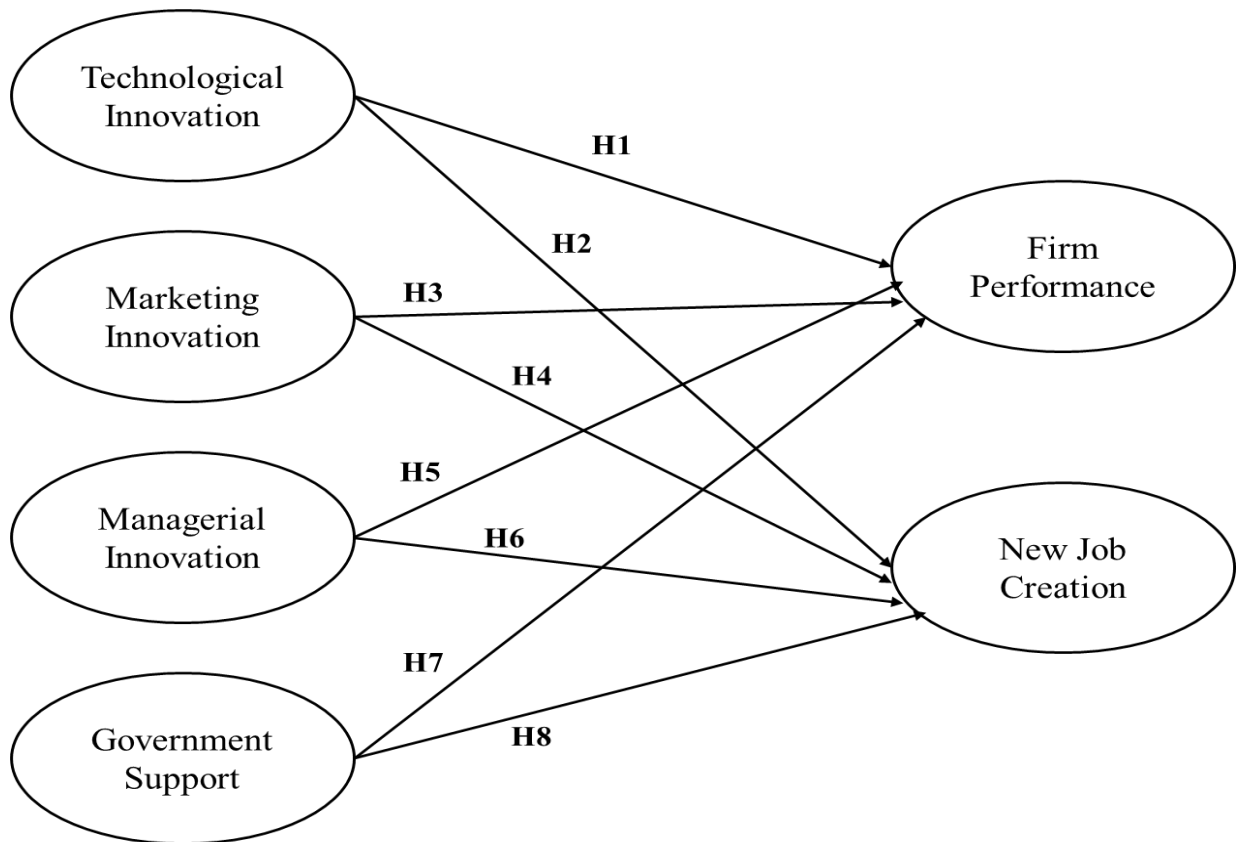


Figure 1
THE RESEARCH MODEL

STUDY DESIGN

Data Collection and Sample

This study used data from the data sets of venture firms in the 2012 Korea Innovation Survey and the 2012 Korea Daejeon Daedeok Venture Survey administered by Daejeon Technopark, a local venture research institute in South Korea. Both data sets include information from 2011 to 2012 about firms, as well as comprise data on innovation activities of firms, opinion on government support programs, R&D activities, opinion on firm performance and job creation in South Korea.

To investigate the effects of innovation types and government support on firm performance and job creation, the current research conducted 20 min interviews with the top

management teams of 10 venture firms before starting the survey. This study used the interview data as basis to determine the key factors to consider in exploring the job creation and firm performance of venture firms. The main questionnaire was sent to 700 companies. Non-venture firms were excluded from the study. Moreover, venture companies that did not return the measurement items were excluded. Accordingly, 488 venture companies were retained.

Measurements and Variables

The measurement items were adopted from prior validated studies. The study model comprised six variables, namely, technological, marketing, and managerial innovations, as well as government support, firm performance, and new job creation. All items on a scale from 1, “Strongly disagree,” to 5, “Strongly agree.”

Technological innovation was organized using the three items considered in Gunday et al. (2011); Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Parez-Caballero (2011); and Yuan, Zhongfeng & Yi (2010). Sample items include “My enterprise introduces a number of new products and changes in the process”, “My enterprises makes an effort to eliminate non-value adding activities in the process” and “My enterprises makes a notable effort to increase the variety and qualities of product and services.”

Marketing innovation was organized using the three items used in Gunday et al. (2011). Sample items include “My enterprise makes an effort to renew the product and service promotion techniques employed for the promotion of the current and new products and services”, “My enterprise makes an effort to renew the product and service pricing techniques employed for the pricing of the current and products and services” and “My enterprises makes an effort to renew general marketing management activities.”

Managerial innovation comprised the three items from Hooley, Greenley, Cadogan & Fahy (2005). Sample items from the scale are, “My enterprise makes an effort to maintain strong financial management”, “My enterprise makes a notable effort to maintain effective human resource management”, and “My enterprises makes a notable effort to maintain good operation management expertise.”

Government support and firm performance items were adopted from Cai, Jun & Yang (2010). Sample items from the government support scale include “The support from the government has positive effects on the quality of products and services of the enterprise” and “The R&D programs conducted by the government has positive effects on efficiency and the current status of the enterprise.” Sample items from the firm performance scale are, “The sales rate of the company has improved”, “The return on assets and return on sales of the company have improved”, and “The operating profits and cash flow of the company have improved.”

Lastly, new job creation was measured using the three items adopted from Kwon et al. (2015) and Lester (2005). Sample items include “The number of new job has increased”, “The quality of new entry job positions has improved”, and “There will be a notable increase in the creation of new employment opportunities in the company.”

RESULTS

Model Validation

Structural equation modelling (SEM) with a confirmatory factor analysis was employed to evaluate the reliability of the hypotheses and constructs. Given that structural equation modelling method is known as an efficient statistical analysis for investigating large samples with endogeneity issue (Anderson & Gerbing, 1988; Kwon, Park & Kim, 2014). Previous studies have suggested that SEM requires the minimum sample size to be larger than 200 for empirical validity (Fornell & Larcker, 1981; Hair, Black, Babin & Anderson, 2006; Kwon et al., 2014). The sample of this research (N=488) meets the standard.

Table 1 shows the internal reliability and convergent validity results. In addition, Table 1 summarizes the factor loading, Cronbach's alpha, item-total correlation, and average variance extracted. Cronbach's alpha is above the recommended reliability of 0.70, thereby indicating high reliability and validity (Guilford, 1965; Hair, Anderson, Tatham & Black, 1998). Thus, all components of the present study are reliable. The reference line for the factor loading value, which indicates the trustworthiness of a model, is 0.30 (Tabachnick & Fidell, 1996). The present study is trustworthy because its factor loading value is above 0.30. In addition, prior studies have suggested that accurate standard errors of measurement results require a composite reliability above 0.7 and average variance over 0.5 for studies with above 200 samples. The present study meets these requirements with 488 valid samples. These results confirm the stable validity of the items.

In addition, the overall fit indices of the research model were satisfactory. The fit indices of the research model were acceptable: $\chi^2/d.f.=2.66$, incremental fit index=0.958, normed fit index=0.934, comparative fit index=0.958, goodness-of-fit index (GFI)=0.928, adjusted GFI=0.901 and root mean-square error of approximation=0.049 (Bentler & Bonnet, 1980; Hair et al., 2006). All correlations between constructs should be lower than the values of the square root of the average variance extracted (Fornell & Larcker, 1981). This research model satisfied all these standards. The results of the reliability and validity of our collected sample are likely to have strong statistical power (Tables 2 and 3).

Construct	Item	Internal reliability		Convergent validity		
		Cronbach's alpha	Item-total correlation	Factor loadings	Composite reliability	Average variance extracted
Technological Innovation	TI1	0.852	0.864	0.709	0.873	0.697
	TI2		0.874	0.809		
	TI3		0.899	0.838		
Marketing Innovation	MK1	0.835	0.836	0.765	0.880	0.710
	MK2		0.881	0.818		
	MK3		0.884	0.801		
Managerial Innovation	MG1	0.845	0.887	0.840	0.909	0.769
	MG2		0.880	0.806		
	MG3		0.856	0.770		
Government Support	GS1	0.725	0.846	0.814	0.788	0.558
	GS2		0.864	0.784		

	GS3		0.704	0.603		
Firm Performance	FP1	0.700	0.758	0.653	0.813	0.594
	FP2		0.838	0.738		
	FP3		0.774	0.602		
New Job Creation	JC1	0.832	0.872	0.751	0.862	0.677
	JC2		0.906	0.831		
	JC3		0.817	0.804		

Fit indices	Values	Recommended level	Sources
χ^2/df	2.66 (p<0.01)	<3.0	Bagozzi & Yi (1988)
NFI	0.934	>0.90	Bentler & Bonnett (1980)
IFI	0.958	>0.90	Browne & Cudeck (1993)
CFI	0.958	>0.90	Fornell & Larcker (1981)
GFI	0.928	>0.90	Hair et al. (2006)
AGFI	0.901	>0.90	Hoe (2008)
RMSEA	0.049	<0.050	Jöreskog & Sörbom (1996)

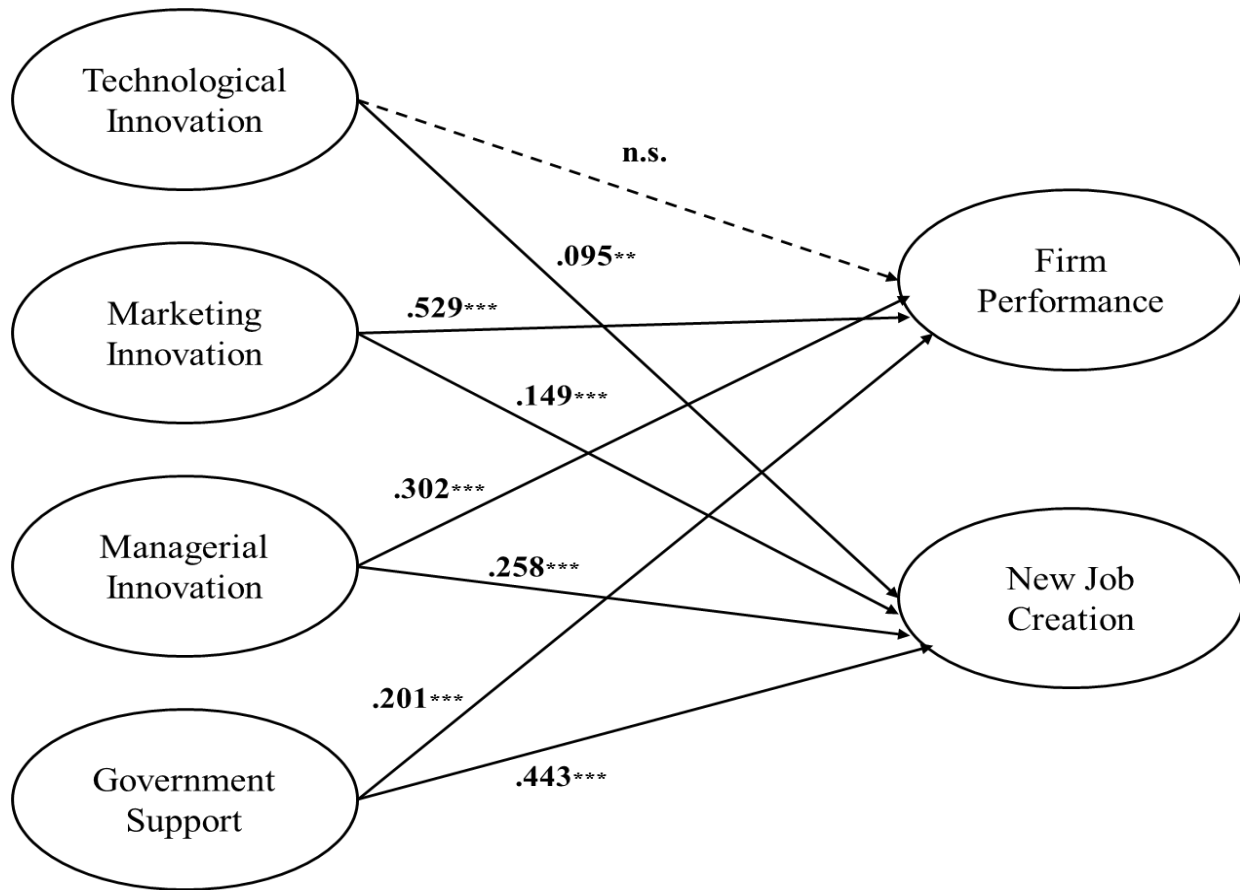
Construct	1	2	3	4	5	6
1. Technological innovation	0.834					
2. Marketing innovation	0.566	0.842				
3. Managerial innovation	0.499	0.681	0.877			
4. Government support	0.560	0.623	0.490	0.747		
5. Firm performance	0.406	0.565	0.580	0.527	0.771	
6. New job creation	0.555	0.672	0.611	0.708	0.506	0.823

Hypothesis Testing

SEM analysis was conducted to test the hypotheses of the current study. Previous research suggests that SEM requires the minimum sample to be above 200 for analytical reliability (Hair et al., 2006). The sample size of the current study ($N=488$) satisfied this standard. All the present hypotheses between the independent variables and dependent variable, except H1, were supported (Table 4). Firm performance was determined by marketing innovation (H3, $\beta=0.529$, $CR=4.855$, $p<0.001$), managerial innovation (H5, $\beta=0.302$, $CR=7.011$, $p<0.001$) and government support (H7, $\beta=0.201$, $CR=5.444$, $p<0.001$). New job creation was influenced by all factors: technological innovation (H2, $\beta=0.095$, $CR=2.602$, $p<0.01$), marketing innovation (H4, $\beta=0.149$, $CR=3.408$, $p<0.001$), managerial innovation (H6, $\beta=0.258$, $CR=5.549$, $p<0.001$) and government support (H8, $\beta=0.443$, $CR=11.083$, $p<0.001$). However, technological innovation did not have a significant impact on firm performance (H1, $p>0.05$). Therefore, all hypotheses, excluding H1, were supported.

Hypotheses	Beta	SE	CR	Supported
H1: Technological innovation → Firm performance	-0.004	0.034	-0.118	No
H2: Technological innovation → New job creation	0.095**	0.036	2.602	Yes
H3: Marketing innovation → Firm performance	0.529***	0.587	4.855	Yes
H4: Marketing innovation → New job creation	0.149***	0.044	3.408	Yes
H5: Managerial innovation → Firm performance	0.302***	0.043	7.011	Yes
H6: Managerial innovation → New job creation	0.258***	0.046	5.549	Yes
H7: Government Support → Firm performance	0.201***	0.037	5.444	Yes
H8: Government Support → New job creation	0.443***	0.040	11.083	Yes

***p<0.001; **p<0.01; *p<0.05



**Figure 2
SUMMARY OF THE RESEARCH MODEL**

Supplemental Analysis

This study performed supplemental analyses based on different firm-level, industry-level, and institutional-level of the sample, in order to examine whether the key connections of the research model were similar or different paths across the level of analytical features of the sample. Results revealed that the different firm-level, industry-level, and institution-level groups presented similar patterns of the research model, compared to the results of the whole sample (Figure 2).

DISCUSSION AND CONCLUSION

This study provides a framework for economic performance and job creation planning by analysing the effectiveness of innovation and government support factors on firm performance and job creation. The findings prove that marketing and managerial innovations, as well as government support, play a significant role in enhancing the performance and job creation of venture firms. This study was designed to prove the significant role of the specific factors of innovation and support policies in increasing new employment and enhancing firm performance in the venture industry. In addition, this research implies that venture executives view marketing management, managerial policy, and government support programs as factors that enhance the convenience of job creation planning and firm performance achievement. Accordingly, marketing and managerial innovations, as well as government support programs, affect employment creation (Dachs & Peters, 2014; Kwon et al., 2015; Levy & Terleckyj, 1983; McWilliams & Siegl, 2001).

The results of the present study contribute to the literature on firm performance research. First, this research links the studies on innovation and firm performance by proving the differential effects of technological, marketing, and managerial innovations on the performance of venture firms in South Korea. The results are consistent with the prior literature on firm performance and innovation activities (Damanpur & Gopalakrishanan, 1999; Entorf & Pohlmeier, 1990; Greenan & Guellec, 2000).

Second, the current research directly compares the effects of three different innovation activities and the government's role. Only a few studies have analysed the influences of innovation types and government effects on new job creation. The results significantly contribute to the creation of new employment of venture firms in South Korea. Accordingly, this study can be used to predict further critical determinants for the adoption of future employment policies in this country. In addition, creating more jobs through innovation strategies could allow venture firms to perform their social responsibilities and to establish social legitimacy. Therefore, we advise executives of venture firms to consider the carry out of systematic innovation approach.

From a practical viewpoint, this study reveals the core roles of internal innovation activities and government assistance in performance enhancement and new job creation of venture companies. Venture firms in South Korea should enhance their active engagement in innovation processes. This research shows the significance of the government's role in boosting new job creation and firm performance growth. In addition, investment and support programs are evidently beneficial to venture firms because these programs enable them to initiate designs that enhance human resource competencies and performance creation.

The relatively weak effects of technological innovation may be related to the environment of the venture industry in South Korea. Korean venture capitalists are reluctant to invest in start-ups at an early stage. Consequently venture firms cannot make sufficient investments in R&D and the portion of technologically innovative venture firms in Korea is lower than the average ratio of OECD countries (Lee & Bae, 2008). Also, some argue that the quality of technological innovation of venture firms in Korea is not high (Kwon et al., 2015; Lee & Bae, 2008; Park, Kwon, Kim, Ohm & Chang, 2014). Thus, the majority of venture employees may not experience the positive effects of technological innovation practices. The present research proves that the top management of venture firms should exercise long-term technological innovation strategies if they intend to create innovation performance.

This research and its scope have several limitations that present possibilities for future studies. First, the sample is restricted to South Korean venture firms. Hence, the determinants of firm performance and new job creation may be different in other countries. New job creation planning and performance-oriented strategies are used worldwide; thus, the results may not be applicable to other countries or conglomerate company environments. For improved generalizability, cross-national research may be conducted to reveal conclusive statements regarding firm performance and new job creation. Second, the sample size was slightly modest. Hence, future research should be conducted using large samples to provide substantially conclusive results regarding the determinants of firm performance and new job creation in the venture context among various types of innovation and government support policies. Third, mediation or moderating construct may exist among the different types of innovation, government support, firm performance, and new job creation. For example, R&D capabilities (Amara & Landry, 2005; Shan, Walker & Kogut, 1994), cultural factors (Casson, 1993), and the vision and direction of a CEO (Scase & Goffee, 1982; Walsh, 1995) tend to exhibit important mediation effects on the economic performance and new job creation of South Korean venture companies.

Future studies on other industries should be conducted and include other mediation or moderation variables. By addressing these limitations, future studies may expand a considerably integrative model to predict the firm performance and job creation of venture firms at the global level. Despite these limitations, the current research has major implications with respect to explaining the mechanisms by which top management selects innovation activities and understanding the relationship among government support, firm performance, and new job creation. The results of this study are expected to spur continuous research aimed at investigating the determinants of firm performance and new job creation, as well as expanding the utilization of government policies and the technological, marketing, and managerial innovation activities of firms. These potential developments can guide the industrial field and future studies on venture growth and new employment.

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