

Article

Exploring Technology Innovation Factors, Government Support and Performance of Development-Related Social Enterprises: Evidence from South Korea

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Abstract: Growing demand for social services and products based on technological innovation has fueled expectations for technological innovation as a source of sustainable competitiveness for small- and medium-sized enterprises and, increasingly, social enterprises. This is especially the case for development cooperation programs that leverage social enterprises, which has resulted in increased funding from the public and private sectors for social enterprises promoting innovative development solutions. However, despite this enthusiasm, there is little clarity on whether this approach has actually been making substantial inroads in achieving intended development impacts. To fill this critical research gap, this study explores technology innovation factors as internal resources of a firm, based on the resource-based view (RBV), and investigates: (1) the relationship between technology innovation factors and performance of social enterprises; and (2) the moderating effect of government support between technology innovation and performance of social enterprises. Using an online survey method, this research collected sample data from 36 development-focused social enterprises headquartered in South Korea, from the 76 firms eligible to participate in the research. Based on a unique dataset of 36, first, this study performed multiple linear regression analysis to examine the effect of technology innovation factors, focusing on entrepreneurship, R&D capabilities and external cooperation of firms, on the social and economic performance of firms. Second, this study further employed a hierarchical regression to test whether government support moderates the causal effects of technology innovation factors on the social and economic performance of social enterprises. The results of this study present a positive relationship between innovative entrepreneurship and economic performance. In addition, this study identified a negative moderating effect of government support on the relationship between technology innovation, particularly R&D capabilities, and economic performance. Specifically, while R&D capabilities alone do not significantly influence a social enterprise's economic performance, as companies receive more government support, the effect of R&D capabilities on economic performance becomes weak. As such, we contend that government support may, under certain circumstances (e.g., such as the level of technology), conflict with an enterprise's pursuit of economic performance.

Keywords: development cooperation; government support; social enterprises; South Korea; technology innovation



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1. Introduction

With the transition from the Millennium Development Goals (MDGs) of 2000–2015 to the Sustainable Development Goals (SDGs) or Agenda 2030, technological advances have been increasingly seen as the driving force behind addressing sustainability and development challenges [1]. This focus on the private sector's role for technology development in developing countries has also been highlighted among social enterprises. In countries such as South Korea, for example, KOICA (Korea International Cooperation Agency), the WT

Foundation and KOTRA (Korea Trade-Investment Promotion Agency) have encouraged social enterprises and ventures to provide creative solutions to development challenges and, as a result, many technology-based social enterprises in South Korea have been taking an active part in aid programs or in doing business in developing countries.

Consequently, there has been a surge in demand for social services and products based on technological innovation. The growing importance of technological innovation as a source of sustainable competitiveness for small- and medium-sized enterprises (SMEs) has also led to an increase in the number of social enterprises utilizing innovative technologies [2–4]. This is especially the case for development cooperation programs that leverage social enterprises and social entrepreneurship within the framework of market-based development approaches, including bottom-of-the-pyramid (BoP) strategies and inclusive business to achieve the SDGs [5–7]. In the case of South Korea, KOICA, a governmental organization that implements official development assistance (ODA), has begun supporting social enterprises and/or ventures through its Creative Technology Solution (CTS) program. The CTS program aims to encourage social enterprises and/or ventures to promote innovative development solutions and contribute to the achievement of SDGs [8].

However, despite this enthusiasm, there is little clarity on whether this approach has actually been making substantial inroads in achieving intended development impacts [9]. Because social enterprises participating in the development cooperation sector often receive support from ODA via funds or other resources, it is crucial to verify if this new form of aid achieves intended social goals and generates sustainable financial returns. Given the growing importance of technology innovation for social enterprise performance and its significant recognition in development cooperation projects, there is an urgent need to investigate these relationships further.

To fill this critical research gap, this study explored the internal resources and capabilities of social enterprises based on the resource-based view (RBV) to derive implications for sustained competitive advantages. Barney [10] and Barney and his colleagues [11] argued that the resources and capabilities of a firm, which are valuable, rare, imperfectly imitable, and not substitutable, are recognized as a strategic source for sustained competitive advantages. In this regard, the RBV has been recognized as a sound theoretical framework for SMEs, particularly technology-based start-ups, in business performance studies [12]. Some of the recent literature on the performance of venture companies and technology-based SMEs, based on the RBV, analyze internal resources by focusing on the sources and capabilities for technological innovation [12–14]. As such, this study aims to contribute to expanding the scope of literature by analyzing the internal resources of the development-related social enterprises in South Korea, focusing on the technological innovation capabilities, which are tangible and intangible resources.

Much prior research has focused on a firm's innovation performance by examining input factors for securing technology innovation and/or superficial performance of the innovation itself, such as intellectual property rights and patent rights [15]. Building on the existing studies, this study aims to test whether social enterprises are achieving acceptable financial performance as well as social performance. Thus, the social performance factor is examined in this study. Furthermore, South Korea provides social enterprises with government support through various mechanisms. As such, this study aims to examine whether government support has a moderating effect between technological innovation factors and the social and economic performance of social enterprises.

This paper contributes to the existing literature by empirically examining: (1) whether technological innovation factors contribute to the creation of financial and social performance of enterprises; and (2) whether government support moderates the effect of technology innovation capabilities on the performance of social enterprises. This study focuses on South Korea for the investigation. Findings from this study should help us determine whether and how development-related social enterprises improve performance and whether and to what extent government support can moderate the impact of technology innovation on social enterprise performance for sustainable growth.

The flow of the rest of this study is as follows: Section 2 discusses a comprehensive literature review and a theoretical framework of this study. Section 3 presents the research methodology, including hypotheses development. Section 4 analyzes the statistical results and key findings with a brief discussion. Finally, the conclusion of the findings, limitations, implications, and suggestions for future research are provided in Section 5.

2. Literature Review

2.1. Defining Social Enterprises

While there are different interpretations and definitions of social enterprises, there is a broad consensus that social enterprises rely on the context of a double bottom-line focus (i.e., social and economic goals), entrepreneurial culture, and utilization of for-profit approaches to management and markets [16]. Unlike commercial enterprises, which pursue a single bottom line, social enterprises are considered to pursue a double bottom line. Therefore, discussion on defining and distinguishing social enterprises from commercial enterprises are largely divided based on this dichotomy between social and profit motives of social entrepreneurs.

The first group of scholars emphasize the dichotomy between profits and social motives [17,18]. Zahra et al. [17] state commercial entrepreneurs are largely driven by profits, and their performance is typically measured by financial returns, while social entrepreneurs adhere to both social and economic goals in pursuing business opportunities, although they remain in the profit-oriented business sector. Additionally, they pointed out that the term-social enterprise-itself combines two vague words implying different meanings to a different group of people, and disagreements persist about the domain of entrepreneurship and greater debates on the word “social.” Martin and Osberg [18] stated that the key difference between entrepreneurs and social entrepreneurs is that entrepreneurs are motivated by “money”, while social entrepreneurs are motivated by “altruism” or philanthropy. Similarly, Zahra et al. [17] also defined commercial entrepreneurs to be largely driven by profits, and their performance is typically measured by financial returns, while social entrepreneurs often espouse both social and economic goals in pursuing a particular opportunity.

A second approach opposes this dichotomy between profits and social motives in understanding social enterprise. Boluk and Mottiar [19] and Kumar and Gupta [20] argued that the dichotomy between profit and social motives has become more blurred. For instance, Boluk and Mottiar [19] insisted that additional motives such as lifestyle, receiving acknowledgment, reputation, and environmental concerns are increasingly observed among social entrepreneurs. This focus on profit and social motives has been a central premise in most studies understanding the definition of social enterprise.

While the definition of “social enterprise” in South Korea is in line with international notions in terms of focusing on profit and social motives, the South Korean government enacted the Social Enterprise Promotion Act (hereinafter referred to as the “Act”) in 2007 and enforced it in 2009. The Act legally defines a social enterprise in Article 2 as “an enterprise . . . that pursues a social objective aimed at enhancing the quality of life of community residents by providing vulnerable social groups with social services and job opportunities while conducting its business activities, such as the production and sale of goods and services” [21]. Meanwhile, development cooperation agencies tend to stay with a wider definition of “social enterprise” and emphasize social impact and financial sustainability [22]. As such, this study takes a wider definition of a social enterprise, regardless of whether companies are certified or not by the 2007 Act, and includes those enterprises that are legally based in South Korea while operating a business to solve socio-economic problems in developing countries.

2.2. Social Enterprises and Development

Social enterprises have attracted growing attention in the development cooperation sector. When it comes to understanding why social enterprises are being leveraged to

achieve broader development goals, there are at least four dynamics underpinning this phenomenon. First, traditional development efforts delivered through donor countries and non-governmental aid organizations have been criticized with respect to development effectiveness. In particular, micro-level development advocates have criticized macro-level development policies [23]. Second, the evolution of various market-based approaches for development have created ripe conditions for inclusive business initiatives. Some examples include the BoP strategy, corporate social responsibility (CSR) and private–public partnerships (PPP). This paradigm shift has led to the growing involvement of social entrepreneurs and has created a social business sector targeting the BoP population [5–7]. Third, in-line with the Sustainable Development Goals (SDGs), global development platforms have recognized technological advances as a driving force for development and have thus emphasized the enterprise’s role in technology development in developing countries [1]. Lastly, a decrease in development funds has become a significant issue in the development community [24,25]. More non-profit development institutions recognize social investments or running a subsidiary social business venture as an alternative to support their social work [24–27]. As such, social enterprises are expected to bring about new innovative solutions and resources with respect to contributing to the SDGs.

In the context of the growing social economy and development paradigm shift from the MDGs to the SDGs, more foreign aid programs have begun to encourage social enterprises to help developing countries build social economies and solve development challenges [28,29]. Advanced donor countries and the South Korean government are transforming ODA policies to promote innovative solutions through partnerships with start-up ventures and social enterprises. At the same time, it is unclear whether this new approach is achieving its desired developmental impact. Given that social enterprises participating in the development cooperation sector often receive support via ODA in funds or other social purpose financial resources, it is crucial to verify whether this new aid approach achieves intended development goals in addition to being financially viable.

2.3. Technology Innovation and Development

Technology-based social enterprises have been recognized as social enterprises harnessing innovative solutions by using science and technology to solve development challenges [7]. For example, Vestergaard Frandsen is a global social mission-driven enterprise that develops products such as Lifestraw for safe water and a permanent mosquito net using innovative technology to combat malaria and tropical disease in developing countries. Recently, various advanced development-related institutions have started encouraging technology-based and mission-driven enterprises to participate in aid programs or operate businesses in developing countries. For example, the UK recognizes the importance of aid-financed innovation through R&D ODA to maximize global development impact [1]. Given the global focus on technology innovation in the development cooperation sector, KOICA has collaborated with social enterprises and start-up ventures to identify new technology-based innovative solutions to various development challenges where conventional aid has struggled to provide effective solutions [8]. SDG 9 (Industrial Innovation and Infrastructure) is also one of the factors that emphasize the importance of technological innovation for sustainable development in developing countries. Poor infrastructure constraints hinder businesses’ productivity by around 40% in some low-income African countries, and more than 4 billion people still lack access to the Internet, with 90% being located in developing countries [30]. In this regard, technology innovation has become a critical source for finding sustainable economic and human development solutions, such as reducing technology gaps between developed and developing countries.

Previous studies have intensively suggested innovation as an important factor in obtaining sustained competitive advantages for SMEs and venture companies [15,31,32]. This is especially the case for venture companies, which are technology-based SMEs, that are faced with the need to secure competitive technological advantage through continuous innovation in a rapidly competitive market environment [13–15,32]. In the process of inno-

vation, firms exploit various external sources of knowledge beyond the internal boundaries of a company to achieve continuous technological innovation. Therefore, the innovation paradigm of technology-intensive companies has been changing from closed innovation to open innovation [15,33]. Many recent studies state that there is a growing interest in the role of open innovation platform (OPI) as a key strategic resource of high-tech based firms [33,34], while Osorno and Medrano [35] point out a careful approach to OPI.

The business management literature has also highlighted technology innovation as a strong predictor of enterprise performance [36–39]. Most studies have examined technology innovation by investigating internal competency and external environmental factors. Internal competency factors of technology innovation are measured by looking at R&D competencies, marketing, management capabilities, entrepreneurship, organizational factors and firm size [15,40,41], while external environmental factors have been measured by studying factors such as government support, corporate environment, external cooperation and ecological uncertainty [15,40,42]. However, in previous studies, these factors have mainly been studied for for-profit companies in the conventional business context, and few studies have explored technology innovation-related factors of social enterprises. In this regard, this study attempts to further broaden the scope of the research by investigating the relationship between technology innovation factors and the performance of social enterprises.

2.4. Measuring Performance in Social Enterprises

As social enterprises are complex organizations that pursue social and economic goals concurrently, measuring “performance” is complicated [43–45]. Studies have found that it is not easy to present a single concept of performance that can be applied to all organizations [46–48]. As such, performance is often conceptualized using sub-constructs and measurement variables rather than defining it explicitly [45,48,49]. While the definitions and regulatory terms and context differ across countries, the performance of social enterprises is similarly examined with sub-constructs in the context of South Korea. For example, Cho et al. [49] explored how the performance of social enterprises is defined and measured by scholars in South Korea and identify most studies conceptualize performance by dividing performance into social and economic impacts.

Social performance can generally be described as the achievement of social values and social contributions that the social enterprise pursues through its business [44,49]. Lee & Cho [44] define social performance as the extent to which social enterprises achieved their intended social goal, such as creating jobs for the vulnerable, providing social services, contributing to the well-being of a community, and working to solve diverse social problems. Chang et al. [36] and Cho et al. [49] define social performance as the level of achievement of social values and contributions that the social enterprise pursues through its business. For the purposes of this study, we follow the definition provided by Cho et al. [50], which defines social performance as a level of achievement of the social values and social contributions that the social enterprise ultimately pursues through its business (p. 34).

In terms of economic performance, sub-components such as revenue/sales and net profit have been prominent in the literature [49]. A number of studies have examined factors such as the degree of financial independence of management, investment capital and cash flows, organizational slack, and budget efficiency [36,44,50,51]. In addition, economic performance has also encompassed customer satisfaction, research and development (R&D), technological competitiveness, job creation and income growth in the community, and service/product competitiveness [15,41,52]. Due to the prominent role of the government in South Korea’s national business system, studies have also examined economic performance in light of government subsidies and the ratio of labor costs [3,42]. In-line with Cho et al. [50] and their definition of economic performance, this paper defines social enterprises’ economic performance as the degree of financial performance and business management independence to maintain and develop a social enterprise.

2.5. The Role of Government Support in Social Enterprises

In South Korea, studies have been mixed regarding the impact of government support on social enterprise performance. One group of studies argues that government support has a positive effect on social enterprises' business performance [3,42]. In a study on government support for the performance of social enterprises using open data sources about the management performance of 76 social enterprises, Kang [42] found that government support for professional human resources and business development can act as a growth driver. Through an analysis of 112 SMEs in the IT industry, Shin and Choi [3] also found that R&D positively affects innovation, with government support (such as financial support, technical support, human resources support) acting as a moderator.

Another group of studies, however, argues that government support harms economic performance by increasing the dependence of social enterprises on government funds [53–55]. In South Korea, various government support channels have been provided under the Social Enterprise Promotion Act (SEPA). Accordingly, there has been active debate about the debate over high dependence on government subsidies. Choi and You [53] and Kim and Kim [54] highlighted high dependence on government grants, particularly dependence on government subsidies for labor costs, even among social enterprises demonstrating sound economic performance. Kim and Lee [55] investigated determinants of economic and social performance of social enterprises, focusing on the effects of government financial support from the central and local governments. The results suggest that while government subsidies do not significantly affect economic performance, they significantly reduce social returns. In this regard, this study aims to further examine the impact of government support on the social and economic performance of social enterprises and its moderating effects on TI factors and social enterprises' performance.

3. Research Methodology

3.1. Research Design

The investigation will focus on the effect of technology innovation factors on social and economic performance of social enterprises. In addition, this study will analyze the relationship between government support and social and economic performance of social enterprises. Lastly, the moderating effect of government support on social and economic performance of social enterprises will be examined. Technology innovation (TI) is an independent variable. This study assesses TI by investigating R&D capabilities (RD), innovative entrepreneurship (IE), and external cooperation (EC) of social enterprises. The performance of social enterprise represents this study's dependent variables and include: (1) social performance (SP); and (2) economic performance (EP). The moderator variable is government support (GS) (see Figure 1).

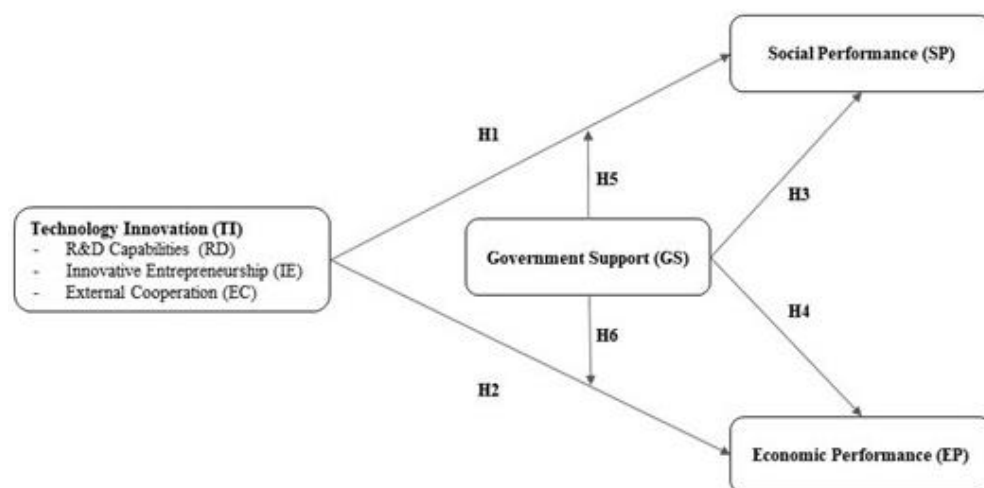


Figure 1. Research Model.

3.2. Hypothesis Development

In the business management literature, technology innovation competencies of small and medium-sized enterprises have been demonstrated as one of the strong predictors of the performance of enterprises [36]. R&D, entrepreneurship of CEO, organizational management strategy, structure, culture, and external environment have been suggested as critical technology innovation factors that influence the performance of enterprises. However, in previous studies, these factors have mainly been studied for for-profit companies in the conventional business context, and few studies have explored technology innovation-related factors of social enterprises. In this regard, this study establishes the following hypotheses to examine the effect of technology innovation factors on the social and economic performance of social enterprises.

H1. *Technology Innovation factors positively influence the social performance of social enterprises.*

H2. *Technology Innovation factors positively influence the economic performance of social enterprises.*

In the non-profit and for-profit literature, evidence on the impact of government support on the performance of social enterprises has been mixed, with some supporting a positive relationship [3,42], while others identify a negative one [53–55]. For this study, we test the following hypotheses:

H3. *Government Support positively influences the social performance of social enterprises.*

H4. *Government Support positively influences the economic performance of social enterprises.*

Lastly, the literature has suggested a potential moderating effect of government support on the relationship between technology innovation factors and the performance of enterprises [56,57]. In this regard, this study establishes the following hypotheses to verify whether there is a significant moderating effect of government support on the social and economic performance of social enterprises.

H5. *Government Support significantly moderates the relationship between technology innovation factors and the social performance of social enterprises.*

H6. *Government Support significantly moderates the relationship between technology innovation factors and the economic performance of social enterprises.*

3.3. Data

The data collection was conducted for 30 days through an online survey using the Google Survey Document. For this research, the target population covers South Korean social enterprises that operate a business to solve socio-economic problems in developing countries. As illustrated in the previous section, the “social enterprise” designation is given for firms that have been certified as social enterprises by the Social Enterprise Promotion Act. According to the Act, social enterprises can be classified into five types: (1) job-creation type; (2) social service provision type; (3) mixed type (job-creation and social service provision type); (4) local community contribution type; and (5) other types. From the initial population, the sample was further narrowed down to companies that operate businesses to solve socio-economic problems in developing countries (“development-related social enterprises”), with South Korea serving as the organization’s legal base (“South Korean social enterprises”).

Globally and domestically, there is no public data source that identifies development-related social enterprises. Development-related think tanks and institutions (e.g., Overseas Development Institute and The World Bank) determine rationales for data collection based on their research purpose. For example, research by Rogerson et al. [58] includes bilateral

IOs' programs supporting enterprise models with a focus on social and environmental impact as datasets for social enterprise promoting programs. In South Korea, governmental and non-governmental interim support agencies run programs that support companies that target socio-economic problems in developing countries. These include the Creative Technology Solution (CTS) Program operated by KOICA, the Smile Together Program (STP) run by Working Together Foundation (WT), and support programs provided by KOTRA. Following previous studies, this research identified enterprises that satisfy the following inclusion criteria as potential participants: (1) South Korean companies that have experienced one or more of the following programs: CTS program, STP, support programs provided by KOTRA; and/or (2) South Korean companies that produce and distribute fair trade products.

After an initial screening, a total of 105 companies were identified. This group was then narrowed down to 76 companies based on specific exclusion criteria. Companies were excluded if: (1) support was canceled for the selected programs (including the CTS Program, WT Program, KOTRA overseas expansion support program); (2) if the period of business operations was less than two years; or (3) if a company is registered outside South Korea.

3.4. Measures

This study's questionnaire consisted of 68 questions encompassing demographic information, social and economic performance, and the business environment relating to technological innovation and government support. These variables were measured using original instruments developed in previous studies and a modified version revised by Kim [59].

"Social Performance" of social enterprises was based on the scale utilized by Lee and Cho [44], with instruments measuring the social and economic performance of social enterprises in South Korea. While instruments originally consisted of 10 items, two items were added to the social performance measurement to reflect characteristics of development-related enterprises (see Table 1). For "Economic Performance," this paper followed the definition presented by Cho et al. [49] as encompassing broad aspects of economic performance (i.e., financial returns and business management independence).

Table 1. Summary of scales.

Factors	Items in Scales	Reference	Cronbach's Alpha
Social Performance (SP)	SP 1: Our company is contributing to achieving the development goals of the countries in the business region. SP 2: Within the past three years, the reinvestment of our companies for social purposes has been increasing. SP 3: Our company is contributing to improving the local environment and improving the quality of life for residents. SP 4: Our company is recognized not only in the local community but also outside. SP 5: Our company is contributing to solving local employment problems. SP 6: The rate of providing social services to the vulnerable in our company is increasing. SP 7: Our company realizes the social values of social enterprises.	Lee & Cho (2015) [44] ¹	0.851
Economic Performance (EP)	EP 1: Over the past three years, our company's sales have been steadily increasing. EP 2: Our company is achieving its profit target this year compared to the previous year. EP 3: Customer satisfaction with our company's products and services is improving. EP 4: The brand value of our company is improving. EP 5: The financial independence of our companies is improving.	Lee & Cho (2015) [44]	0.821

Table 1. Cont.

Factors	Items in Scales	Reference	Cronbach's Alpha
R&D Capabilities (RD)	RD 1: Our company has superior R&D capabilities to our competitors. RD 2: Sufficient R&D manpower is secured in our company. RD 3: Our company has R&D capabilities to respond to technological changes. RD 4: Our company has core technologies for our flagship products. RD 5: Our company has rich experience in core technology R&D.	Choi (2015) [15]	0.950
Innovative Entrepreneurship (IE)	IE 1: Top management is actively aware of customer needs. IE 2: Top management takes a new approach to technical issues. IE 3: Top management encourages the creation of new ideas.	Choi (2015) [15]	0.849
External Cooperation (EC)	EC 1: Our companies are fully utilizing external networks to search for information related to technology development innovation. EC 2: Our company is making full use of external organizations that have official partnerships for technology development innovation.	Choi (2015) [15] & Kim (2021) [59] ²	0.933
Government Support (GS)	GS 1: Our company has received funding from the central and local governments for the past 3 years. GS 2: Our company has received technical support from the central and local governments for the past 3 years. GS 3: Our company has received manpower support from the central and local governments for the past 3 years. GS 4: Our company has received support for preferential purchase of public institutions from the central and local governments for the past 3 years.	Shin & Choi (2008) [3] ³	0.747

¹ Modified to include: “The rate of providing social services to the vulnerable in our company is increasing” and “Our company realizes the social value of social enterprises.” Through the validity and reliability test, two items (SP2, SP5) were deleted. After elimination of two items, the final Cronbach’s alpha score of the measurement for SP became 0.895. ² Modified to measure the degree of the use of external cooperation resources by including two items: “Our companies are fully utilizing external networks to search for information related to technology development innovation” and “Our company is making full use of external organizations that have official partnerships for technology development innovation.” ³ Modified to include one item: “Our company has received support for preferential purchase of public institutions from the central and local governments for the past 3 years.”

This study measured “Technology Innovation” (TI) sub-factors based on the scale defined by Choi [15], which explored the relationships between entrepreneurship, innovation capability, external cooperation, and technological innovation performance of venture enterprises to measure the capabilities of technology innovation. The original scale developed by Choi [15] measured “Research and Development” capabilities (R&D) and “Innovative Entrepreneurship” (IE) by using a seven-point Likert-scale, and assessed “External Cooperation” (EC) with a five-point interval scale. While this study adopted the original instruments by Choi [15] to measure R&D and IE, this study revised the original instruments and measured the degree of use of external cooperation resources by using a seven-point Likert-scale to match scale attributes for other variables.

For R&D, the original scale presented by Choi [15] was utilized to measure R&D capabilities. This consisted of five items inquiring about the degree of: (1) R&D capabilities superior to competitors; (2) sufficient R&D personnel; (3) R&D capabilities to respond to technological changes; (4) core technologies for flagship products; and (5) experience in R&D related to the core technology. In addition, the questionnaire prodded further by exploring whether there is an independent R&D department, dedicated R&D personnel within the company, whether a company has a research institute affiliated with the company, and whether there are technical advisors inside the enterprise.

For IE, this refers to the entrepreneur’s pursuit of technological innovation and willingness to innovate technology. For the study, it is defined as the proclivity of an entrepreneur regarding new technologies and markets, empathy, support, and momentum for innovation [15]. Innovative entrepreneurship is measured using the original sub-scale consisting of three items presented by Choi [15]. This is estimated according to the degree to which the CEO actively accepts customer needs, attempts a new approach to technical issues, and encourages new ideas. This study adopts the definition of “External Cooperation” (EC) defined by Choi [15]. EC is defined as the effort of a company to continuously maintain a

cooperative relationship to secure technical know-how from outside the organization for technology introduction and innovation [22]. EC is measured using the subscale presented by Kim [59]. Kim [59] revised the original subscale presented by Choi [15] to include questions that examined: (1) whether a company sufficiently uses external networks to search for information related to technology development innovation; and (2) whether a company sufficiently uses external organizations with official partnerships for technology development innovation.

“Government Support” (GS) is measured using a scale consisting of four items. The scale is based on the scale used in the study by Shin and Choi [3], with an additional item added to reflect a new form of government support: preferential purchasing support. The five items encompass whether a company has received sufficient government support, including financial, technical, workforce, and preferential purchase support for public institutions.

4. Key Findings and Discussion

Of the 76 companies eligible to participate in the research, a total of 36 participated in this study, representing a response rate of 47.4%. First, descriptive statistics and frequency analyses were conducted to understand sample characteristics. Second, Cronbach’s alpha value was explored through reliability analysis to verify each variable’s internal consistency scale. Third, bivariate analysis using Pearson correlations examined the correlation between the dependent variables and key variables. Fourth, multiple linear regression analysis tested the associations between technological innovation sub-factors and social and economic performance variables. Lastly, hierarchical regression analysis was used to verify whether government support moderates the causal effects of technological innovation factors on the social and economic performance of social enterprises.

4.1. Sample Characteristics

Survey participants included 21 enterprises registered under civil law (58.3%) and 12 companies registered under commercial law (30.6%). Four companies were reported as an incorporated company, a for-profit corporation, a limited company, and an agricultural and fishery corporation, respectively. A total of 22 respondents were identified as non-profit organizations (61.1%) and 14 as for-profit organizations (38.9%) (see Table 2). Core products and services of respondents included the health sector (36.1%), environment (22.3%), education (13.9%) and social welfare (11.1%). In terms of the development cooperation sector, companies were identified as engaging in the health sector (36.1%), technology, environment, and energy (27.8%), education (19.4%), and agriculture and fishery (11.1%). Respondents were found to be most active in the BoP markets in the Asia-Pacific region (77.8%), followed by Africa (36.1%), the Middle East and Central Asia (16.7%).

Table 2. Summary of sample characteristics.

Variables	N	Percent	M	SD
Business type				
Non-profit organization	22	61.1%		
For-profit organization	14	38.9%		
Firm age			6.8	3.3
Less than 5 years	8	22.2%		
5–less than 10 years	23	63.9%		
10–less than 15 years	3	8.3%		
More than 15 years	2	5.6%		
Firm size (N = employees)			13.4	12.8
Less than 5 employees	20	55.6%		
5–less than 10 employees	8	22.2%		
10–less than 20 employees	4	11.1%		

Table 2. Cont.

Variables	N	Percent	M	SD
20–less than 30 employees	2	5.6%		
More than 30 employees	2	5.6%		
Social value accreditation			0.39	0.5
Not certified	22	61.1%		
Certified	14	38.9%		
Types of certification				
SE certification	10	27.8%	0.3	0.5
Pre-SE certification	3	8.3%	0.1	0.3
Other certification	4	11.1%	0.1	0.3
Turnover in 2019 (KRW)			1.6	1.2
Less than 300 million	17	47.2%		
300 million–less than 1 billion	12	33.3%		
1 billion–less than 2 billion	4	11.1%		
2 billion–less than 3 billion	0	0.0%		
More than 3 billion	3	8.3%		
Income not from sales (KRW)			2.8	1.6
Less than 10 million	12	33.3%		
10 million–less than 50 million	7	19.4%		
50 million–less than 100 million	1	2.8%		
100 million–less than 300 million	10	27.8%		
More than 300 million	6	16.7%		
Government subsidies (KRW)			4.1	1.2
Less than 10 million	1	2.8%		
10 million–less than 50 million	5	13.9%		
50 million–less than 100 million	2	5.6%		
100 million–less than 300 million	10	27.8%		
More than 300 million	18	50.0%		
R&D environment				
R&D department	28	77.8%	0.8	0.4
Research institute	23	63.9%	0.6	0.5
Technical advisory in company	18	50.0%	0.5	0.5

In terms of accreditation, 37.8% of respondents have a social value accreditation, while 62.2% were not accredited by any form of external certification. For the length of business operations, 23 enterprises (63.9%) operated their businesses between five and nine years, while eight companies (22.2%) operated their business for less than five years. Most companies employed less than five employees (55.6%), with 22.2% employing 5 or more employees but less than 10. A total of 47.2% of respondents reported annual sales of less than KRW 300 million, with 33.3% of respondents reporting annual sales of between KRW 300 million and KRW 1 billion as of 2019. Regarding the level of government subsidies received over the past three years (2017–2019), 50% of respondents received more than KRW 300 million. In terms of the R&D environment, 77.8% of respondents had a dedicated R&D department, and 63.9% had an affiliated research institute. Overall, 50% of respondents reported having an internal technical advisory member(s).

4.2. Descriptive Analysis and Correlations

Table 3 presents descriptive analysis results. Looking at the mean score of performance, we find that respondents exhibited slightly higher levels of economic performance compared with social performance. Social performance scores ranged from 2.40 to 7.00, with a mean score of 5.25 and a standard deviation of 1.18. Economic performance ranged from 3.80 to 7.00, with a mean score of 5.34 and a standard deviation of 1.00. R&D capabilities ranged from 2.00 to 7.00, with a mean score of 4.98 and a standard deviation of 1.44. Innovative entrepreneurship ranged from 2.33 to 7.00. The mean score is 5.68, with a

standard deviation of 0.97. External cooperation ranged from 1.00 to 7.00. The mean score is 4.79, with a standard deviation of 1.63. As shown in Table 3, participants' technology innovation capacities were high, considering that the average score of TI sub-scale is 5.15 out of 7 points. Government support ranged from 1.00 to 7.00, with a mean score of 4.00 and a standard deviation of 1.51.

Table 3. Descriptive analysis.

Variables		N	Min	Max	Mean	SD
Performance	Social performance	36	2.14	6.29	5.25	1.10
	Economic performance	36	3.80	7.00	5.34	1.00
Technology Innovation	R&D capabilities	36	2.00	7.00	4.98	1.44
	Innovative entrepreneurship	36	2.33	7.00	5.68	0.97
	External cooperation	36	1.00	7.00	4.79	1.63
Government Support		36	1.00	7.00	4.00	1.51

Before conducting linear regression and hierarchical regression analysis, correlation analysis was performed to check whether there is a multicollinearity problem among variables. Table 4 presents the results of the Pearson correlations of variables. The result indicates that innovative entrepreneurship is significantly correlated with economic performance ($r = 0.431$, $p \leq 0.01$), and external cooperation is significantly correlated with economic performance ($r = 0.329$, $p \leq 0.05$). No correlation was found between independent variables.

Table 4. Result of Pearson correlations between variables.

		SP	EP	RD	IE	EC	GS
SP	Pearson Correlation	1					
EP	Pearson Correlation	0.674 **	1				
RD	Pearson Correlation	0.055	0.066	1			
IE	Pearson Correlation	0.206	0.431 **	0.239	1		
EC	Pearson Correlation	0.279	0.250	0.329 *	0.128	1	
GS	Pearson Correlation	0.159	0.088	−0.033	0.232	−0.065	1

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

4.3. Regression Analysis

In the literature, firm age (operating years) and firm size (number of paid employees) have been used as control variables [3,42,60]. In this study, however, no significant differences are noted in the mean scores of social and economic performance based on firm age and size. As most companies participating in this study were firms that operated for less than 10 years and employed fewer than 10 employees, our study does not include these as control variables considering the limited sample size and smaller scale of operations. While the regression model in which TI factors lead to social performance was not significant (see Table 5), the regression model to economic performance of social enterprises was found to be statistically significant ($F = 3.277$, $p < 0.05$) (see Table 6). When EP is regressed onto RD, IE, and EC variables, IE is found to have a significant effect on EP ($\beta = 0.505$, $p \leq 0.05$). In sum, all three TI factors have no significant effect on social enterprises' social performance, while IE is found to have a significantly positive effect on EP.

This study further explored the moderating effect of government support in relation to technological innovation factors and the performance of social enterprises. This study employed the hierarchical regression model proposed by Baron and Kenny [61]. In Step 1, EP is regressed onto a mean-centered independent variable (TI variables). In Step 2, the mean-centered moderating variable (mcGS) was added. In Step 3, an interaction term of the relevant independent variable and a moderator GS was entered into the regression

model. Mean-centered values for both independent and moderator variables were used to reduce the multicollinearity problem.

Table 5. Regression results between TI factors and SP.

Model		Unstandardized Coefficient		Standardized Coefficient	<i>t</i>	<i>p</i>
		B	Std. Error	β		
SP	RD	−0.063	0.137	−0.083	−0.459	0.650
	IE	0.214	0.194	0.189	1.103	0.278
	EC	0.190	0.119	0.282	1.595	0.120
	<i>F</i>			1.357		
	R^2 (adj R^2)			0.113 (0.030)		
	Durbin–Watson			1.875		

Table 6. Regression results between TI Factors and EP.

Model		Unstandardized Coefficient		Standardized Coefficient	<i>t</i>	<i>p</i>
		B	Std. Error	β		
EP	RD	−0.078	0.116	−0.113	−0.676	0.504
	IE	0.440	0.164	0.428	2.683 *	0.011
	EC	0.143	0.101	0.233	1.420	0.165
	<i>F</i>			3.277 *		
	R^2 (adj R^2)			0.235 (0.163)		
	Durbin–Watson			2.167		

Note: $p^* \leq 0.05$.

As a result, this study verified GS' moderator effect between RD and EP at the p -value 0.028. The regression model was statistically significant in Step 3 ($F = 1.921$, $p < 0.05$). EP was regressed onto a mean-centered RD (mcRD) in Model 1 (see Table 7). In Model 2, mean-centered moderator GS (mcGS) was entered. Model 2 is found to explain only 1.2% of the variance. When the interaction terms mcRD and mcGS were entered in Model 3, the variance explained by Model 3 ($R^2 = 0.153$, $p < 0.05$) significantly increased by 14.1% over Model 2 ($R^2 = 0.012$, $p < 0.05$). This demonstrates that the addition of the interaction term has a significant moderator effect in the model. The value of Durbin–Watson (2.263) indicates no autocorrelation problem in the model, and all VIF values are less than 10. Thus, no multicollinearity problem is noticed. According to the Coefficients result, the interaction term between RD and GS had a negative (−) effect on EP ($\beta = -0.413$, $p < 0.05$). Therefore, the results suggest that government support (GS) has a pure negative moderator effect between R&D capabilities and economic performance [50]. In short, our findings suggest that government support would control R&D capacities influencing the economic performance of social enterprises.

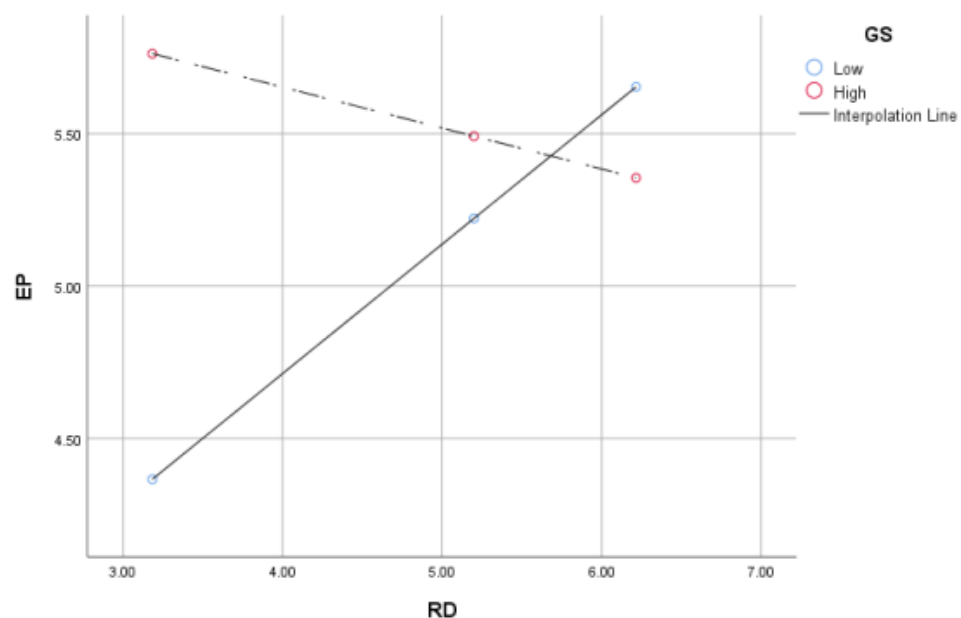
Figure 2 shows that the effect of R&D capability on economic performance varies according to the degree of government support. In the case of the group that answered that they did not receive sufficient government support, R&D capabilities and economic performance demonstrate a positive relationship. On the other hand, for the group that responded that they received sufficient government support, R&D capabilities and economic performance demonstrate a negative relationship. Furthermore, economic performance modestly decreased as R&D capabilities increased for companies that received sufficient government support, while economic performance sharply increased for companies that did not receive sufficient government support as their R&D capabilities increased.

Table 7. Moderating effect of government support (GS) between RD and EP.

Model		Unstandardized Coefficients	Standardized Coefficients	<i>t</i>	<i>R</i> ² (ΔR^2)	<i>F</i>
		B (S.E.)	β			
1	mcRD	0.066 (0.171)	0.066	0.385	0.004 (0.004)	0.148
2	mcRD	0.069 (0.173)	0.069	0.398	0.012 (0.008)	0.208
	mcGS	0.090 (0.173)	0.090	0.521		
3	mcRD	0.210 (0.174)	0.210	1.206	0.153 (0.141)	1.921 *
	mcGS	0.197 (0.169)	0.197	1.164		
	mcRD_mcGS	−0.407 (0.177)	−0.413	−2.300 *		

Durbin–Watson: 2.263

Note: Independent Variable: mean-centered RD (mcRD); Dependent Variable: mean-centered EP (mcEP); Moderator: mean-centered GS (mcGS); Interaction Term: mcRD \times mcGS. * *R*² of regression equation without an interaction term. ΔR^2 : *R* square change.

**Figure 2.** Moderating effect of GS between RD and EP.

5. Conclusions

Given the growing importance of technology development in developing countries and technology innovation capabilities as key drivers of social enterprises' performance, this paper investigated the effect of technology innovation factors on the performance of development-related social enterprises and the moderating effect of government support on the relationship between technology innovation and performance. Our analysis found that 27.8% of the sample firms in this study reported that they engage in the technology, environment, and energy sector, which is the second biggest segment for our sample profile. In terms of the level of technology utilized in products and services, more than one-half adopted innovative technologies (58.3%), while 19.5% used appropriate technologies. Venture companies, which are technologically innovative SMEs, are faced with the need to secure technological competitive advantage through continuous innovation in a rapidly changing market competition environment. Prior studies have found that innovation is an important factor in the growth of venture companies. However, the existing literature has analyzed the effect of technology innovation on innovation performance, such as patents, which limits the scope of implications for firms and investors whose ultimate interest is to obtain financial profits driven from technological innovation [12,15]. In this regard, the empirical findings of this study provide tangible evidence which supports prior

research by presenting a positive relationship between the technology innovation factor—innovative entrepreneurship—and the economic performance of enterprises [15]. Second, this study identified a negative moderating effect of government support on technology innovation, particularly R&D capabilities and economic performance. For companies with a high degree of government support, economic performance decreased as R&D capacity increased. Considering that government support includes technical support for R&D, this is an unexpected finding. This indicates that while R&D capabilities alone do not significantly influence a social enterprise's economic performance, as companies receive more government support, the effect of R&D capabilities on economic performance becomes weak. As such, we contend that government support may, under certain circumstances, conflict with an enterprise's pursuit of economic performance. This complex moderating effect of government support presents an opportunity for further research. Ahn et al. [12] argued that the effect of having an in-house R&D department for technological innovation is insignificant. In this regard, further analysis of the R&D resources and capabilities of firms will provide in-depth understanding of the effect of government support and directions for improvements in the inefficiency of public R&D investment in the technological innovation in technology-based venture companies in South Korea.

While this study contributes to the existing literature by empirically investigating the technological innovation factors of socially driven SMEs, especially targeting the development challenges in emerging markets, there are still limitations to this study that may be addressed in future research. First, although the survey response rate was close to 50%, the specifications of this study (i.e., development-related social enterprises headquartered in South Korea) resulted in a small sample. While we attempted to overcome this limitation with a bootstrap analysis, further research with a larger number of samples may extend the research scope and applicability of our research findings. Second, while the Structural Equation Model (SEM) is a popular method analyzing a moderating effect in social science research, this study employed a regression analysis method to analyze the moderating effect of government support between key variables, due to the sample size limitations. Third, this study limited the scope of analysis by studying development-related social enterprises in Korea. As the prior literature has analyzed social enterprises' performance according to business factors, such as market environment features and the type of products and services, future research may also delve into the influence of the market environment by extending the analysis to target social enterprises in developing countries.

While limitations of this study include using a small data sample, the study is meaningful in that it is the first empirical study targeting South Korean social enterprises participating in the development cooperation sector. As such, this study provides a unique empirical analysis in this area of research. In addition, this study contributes to designing reliable instruments that measure performance and technology innovation sub-factors of development-related social enterprises. This study also highlights the importance of the role of entrepreneurs, particularly innovative entrepreneurship, on economic performance.

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