An Explorative Study of Resilience Influence on Business Performance of Korean Manufacturing Venture Enterprise

Boine Kim 1 and Byoung-Goo Kim 2,*

1 Department of Global Commerce, Hoseo University, Cheonan 31066, Republic of Korea; bk130@naver.com
2 Department of International Trade, Korea National Open University, Seoul 03087, Republic of Korea
* Correspondence: bgkim@mail.knou.ac.kr; Tel.: +82-10-2248-1151

Abstract: Due to the recent trend of sustainability and socio-economic changes and to expand the research on resilient supply chains in Korea, this study targets Korean venture companies to ensure their success and growth. This study aims to analyze the reliance factors affecting the business performance of Korean manufacturing venture enterprises by considering two types of business performance: technology and financial performance. Regarding the factors influencing business performance, this study analyzes five resilience factors: product structure intensity, brand intensity, research and development intensity, cooperation, and corporate social responsibility. Business years were used as control variables and the causal relationship between the factors was analyzed using SPSS 22. The results show that all resilience factors positively influenced technology performance. The results for the financial performance show research and development intensity and corporate social responsibility. However, cooperation only shows different results between technology performance and financial performance. Based on these results, this study provides implications and contributions for manufacturing venture enterprises.

Keywords: venture enterprise; business performance; resilience; intensity; cooperation; corporate social responsibility

1. Introduction

Due to the recent trend of global development in sustainability and social-economic requirement changes, resilient supply chains (RSCs) and the circular economy (CE) in political and business communities have gained attention. As Craig, DeHoratius, and Raman [1] stated, resilience increases the competitive advantage of an organization in current violent markets. Since 2018, practitioners and academics have been researching the developmental trend of the combination of the CE and RSCs as the significance concerning them increases [2,3]. However, research in this area is still in its initial stages and more studies are needed. In particular, research on resilience in Korean businesses is very limited [4–8]. Since Staw et al. [9] and Meyer [10] started using the concept of resiliency, it has been studied at the organizational level [11–13] and at the employee level [13–16]. Resilience is now popular in business practice, academic studies, public policy, and the press. However, there are still a variety of discussions and studies on the concept, definition, and measurement of resilience, with a consensus still being necessary [17–19].

In particular, for the Korean economy and the companies operating in that country, understanding and applying the concepts of resilience, CE, and RSCs is important, where the manufacturing industry accounts for 27.5% of the total gross domestic product (GDP) and 16.3% of employees, as of 2021 (istans.or.kr, accessed on 22 April 2022), serve as a prop for the economy. In addition, the government’s interest in “economic growth and technological progress through small and medium-sized enterprises (SME) and venture companies” is seen as a way to steadily implement policies and support the growth of venture companies. Although venture companies show quantitative growth, it is necessary to address qualitative growth in terms of the survival rate and corporate performance [20].
Therefore, this study applies the resilience concept, which has received more attention following the many business disruptions caused by the COVID-19 pandemic, to analyze and discuss the resilience factors of SMEs in Korean venture firms in manufacturing, which are a key pillar of the Korean economy. As SMEs tend to have insufficient resources, resilience can be used as a key resource to enable SMEs to adapt to unpredictable and sudden environmental changes. As there are limited studies on Korean manufacturing SMEs and resilience [6,20,21], the purpose of this exploratory study is to analyze the factors affecting the performance of manufacturing venture companies in terms of resilience.

This study proposes the following two research questions:

1. What resilience factors impact and how do they impact business performance?
2. Does resilience influence financial performance and non-financial performance differently or similarly?

Based on the literature, this study considers two types of business performance: financial and non-financial. Additionally, this study considers the four resilience factors taken from Howells [22]: productivity, agility, connectivity, and sustainability. Based on the empirical results, this study then suggests management implications for Korean manufacturing venture companies. Utilizing public data allowed for the study to increase the continuity and scalability of future research on Korean venture resilience. These data were obtained from the Venture Business Precision Survey (2020) and was collected from venture companies that are approved by the Ministry of SMEs and Start-ups and the Korean Venture Business Association. This study analyzes causal relationships using regression analysis with SPSS 22.

The remainder of this article is organized as follows. Section 2 summarizes the literature and hypotheses, while Section 3 reviews the methodology, the research model, measurement, and data. Section 4 presents the findings of the empirical analysis, and Section 5 concludes the article and discusses the implications and suggestions for future studies.

2. Literature Review and Hypotheses Setting

2.1. Resilience Concept

While the concept of resilience is widely used in environmental science, organizational research, and engineering [23], there is no consensus on one single definition, with authors’ definitions being diverse [17–19]. Resilience originated from the Latin word ‘resilis’ meaning ‘to jump/spring back’ which contains two dictionary definitions: elasticity and buoyancy. Elasticity is that can return to its original state after bending, stretching, and compression. Additionally, buoyancy is that face recovery power after/from external changes or chocks [24,25]. It is easy to understand when you think of a spring that has the property of returning to its original state when deformation occurs due to external pressure. However, the common concepts include adaptability or adaptive capability [26,27]. Reliance is applied and studied in various fields such as psychology, sociology, social ecology, education, engineering, environmental engineering, urban planning, public administration, etc. Additionally, it is interpreted and utilized in various ways such as resilience, adaptability, overcoming, and resilience. Recently, international organizations such as the UN, the OECD, the WEF, and the World Bank have also mentioned the importance of resilience. The concept of resilience in the management and business literature originates from studies by Staw et al. [9] and Meyer [10]. Since the mid-1980s, the primary focus of resilience studies has been firm-internal disruptions from industrial accidents and the reliability of technologies at high risk. It was the events of 11 September 2001, also known as 9/11, that changed the focus of resilience to external threats. Following 9/11, the primary focus of resilience was coping, as well as the response mechanisms and strategies under great uncertainty in the business environment [19]. In recent years, the shift in Industry 4.0, political and economic upheavals, climate change events, and the COVID-19 pandemic have reinforced business disruptions. Resilience is a trendy concept in risk management [26–29], with resilience and RSC receiving more attention from practitioners and researchers. Sheffi [30] suggests three elements of RSC: redundancy, cultural change,
and flexibility. Fisher et al. [31] suggested three elements of resilience: recovery, resources, and robustness. Based on the literature, this study used Howells’s [22] four key digitalization areas for resilience: productivity, agility, connectivity, and sustainability. According to Howells [22], productivity concerns high-quality mass-produced or make-to-order products. Agility is related to sensing, predicting, and responding to market dynamics. Connectivity ensures collaboration and visibility across the end-to-end supply chain. Sustainability involves balancing the importance of profitability, people, and the planet. Since this study considers the increase in continuity and scalability of future research on Korean venture resilience, Howells’ [22] concept is the most suitable for Korean ventures and is therefore used in this study to measure variables and conduct an empirical analysis of Korean venture resilience.

2.2. Resilience and Business Performance

The literature on resilience and business performance focuses primarily on supply performance. According to Singh et al.’s [32] study, performance measurement used in resilience-related analysis studies considered lead time [23,33–37], cost [34–38], customer loyalty [23,37], recovery to shutdown [39,40], and subjective outcomes [13,16,21]. Few studies have considered financial and economic performance [13,16,37,41,42].

Based on the literature, this study considers two types of business performance: financial and non-financial and measures two financial performance metrics: sales and profit. Following Beuren et al.’s [13] and Kang & Stephens’ [21] research, this study considered non-financial performance as a mediator between factors and financial performance. Non-financial performance was measured as technology performance, which is considered operational performance.

According to the literature on resilience as an antecedent of business performance, Sheffi [30] and Fisher et al. [31] suggested three elements and Hemant et al. [43] studied roughly thirty-one diverse aspects of resilience. Howell [22] suggested four points. Since this study considers the increase in continuity and scalability of future research on Korean venture resilience, Howells’ [22] concepts of productivity, agility, connectivity, and sustainability are most suitable for Korean ventures.

2.3. Korean Manufacturing Venture Enterprise

Resilient-related research on Korean businesses is scare [4–8,21], especially the research on Korean SMEs and venture and manufacturing companies is limited [4,6,21]. Kim et al. [5] studied the resilience and robustness and the changes in sales pre-/post-COVID-19 in Seoul retail. Their study shows that based on the change in sales clustering of time series can be used in retail areas. Yu and Kim [7] studied the economic resilience of Korea’s region after the 2008 economic crisis at the employee-level in administrative units. From the evolution and engineering perspective, their analysis showed the spatial patterns in most regions. Weng [8] (2021) analyzed public crisis cases with Turner and Kayes stage model from Sanlu, Samsung Electronics, and Toyota. Additionally, the study discussed and remedies for forming a resilient business strategy. Bianchini and Kwon [6] (2021) reported the role of government programs in strengthening SMEs’ resilience to external shocks. The report focused on the SME digitalization policies implemented in Korea during the COVID-19 pandemic. Their report examines how digital tools and services have made SMEs more resilient during the pandemic, as well as points out the challenges that SMEs face in “going digital.” Kang and Cho [4] (2021) analyzed the relationship between firm-level knowledge management activities and financial performance and the mediating role of resilience. Their study shows that resilience (robustness, substitutability, resource mobilization, agility) mediates between knowledge management (knowledge-creating, knowledge sharing, knowledge diffusion) and financial performance. Kang and Stephens [21] examined the antecedents of supply chain resilience and its influence on South Korean manufacturers’ operational performance. Their study analyzed the relationships between five variables and showed that management intention and supply chain disruption orien-
tation increased innovation adoption. Supply chain disruption orientation digital infrastructure capability and innovation adoption increased supply chain resilience. Innovation adoption and supply chain resilience also increased operational performance.

2.4. Hypotheses Setting

Product diversity decisions are a very important decision-making issue for many manufacturers. In the past, manufacturers used mass production, which reduced the unit price and increased production efficiency by making one type of product in the same amount. However, as market trends and technological developments diversify customer requirements, today’s manufacturing paradigm has changed to mass customization to maintain mass production efficiency and meet diverse customer needs [44] (Pine, 1993). In particular, with the recent increase in product diversity, effectively producing multiple varieties in a limited production line at the same time as satisfying customer demand has emerged as a major issue in the manufacturing industry in terms of resilience.

To achieve a mass production plan, in the product design stage, uses a product family design strategy that differentiates according to customer needs and launches a common subsystem, technology, process, etc. [45]. In this respect, companies that effectively build product diversity will be able to achieve it through technological efforts. In other words, companies with high product diversity are judged to have good performance. On the other hand, product diversity can increase production complexity while responding to the diversification of customer needs, resulting in productivity degradation. Empirical observations and simulations have shown that the production of a variety of products has a negative impact on production system performance [46,47]. To reduce this degradation in production performance, studies have been conducted on sharing common parts between products [48,49]. Thus, product diversity is likely to have a negative impact on financial performance. Through this conflicting logic, this study established the following hypothesis.

**Hypothesis 1-1.** The company’s Product Structure Intensity will have a positive impact on business performance.

**Hypothesis 1-2.** The company’s Product Structure Intensity will have a negative impact on business performance.

Many researchers and managers continue to argue that brands and their managerial capabilities play a crucial role in securing and maintaining a company’s competitive advantage [50,51]. This means that companies’ efforts to successfully create and retain powerful brands will help ensure long-term profitability and market power [52]. Specifically, tangible resources such as financial capital, physical assets, and machinery production facilities can be easily imitated by competitors and moved to other organizations, while brands and companies’ brand management capabilities that can be used in marketing activities are difficult to buy or imitate.

Companies create a brand through their ability to use the various management resources they have to meet their strategic goals to create, maintain, and achieve their ultimate goal of competitive advantage. In other words, a company’s possession of a specific brand is thought to have the ability to combine it with other management resources to create synergy effects or create competitive advantages that can realize differentiated brand and product development opportunities [50]. The higher the company’s Own Brand Intensity, the more likely it is that the company’s management performance will be higher. Through this logic, this study established the following hypothesis.

**Hypothesis 2.** The company’s Own Brand Intensity will have a positive impact on the business performance.
In this rapidly changing business environment, most companies are making a large effort to improve R&D capabilities to secure a competitive advantage and survive and overcome the management crisis. Such efforts have led to the retention of core competence and lead time advantage in the market in the medium to long term [53]. The importance of R&D capabilities is shared by many scholars, but the definition varies from scholar to scholar. Brockoff et al. [54] described R&D capabilities as systematic activities that companies promote through internal or external institutions to acquire or utilize natural scientific or engineering knowledge. Since then, R&D capabilities have been highlighted as the company’s most representative innovative capabilities, and its components have been extended to broader concepts including strategy, project portfolio management, project drive, and R&D investment [55]. Ince et al. [56] considered the company’s R&D capabilities as one of the sub-factor of its innovation capabilities and understood as the capabilities needed to respond to unexpected technological changes and meet current or future market needs through new product development.

Research on R&D capabilities and business performance has been studied in various ways. In many studies, R&D investment showed a significant positive impact on financial performance [57–62]. Additionally, R&D capabilities showed a significant positive impact on innovation performance [55,63,64]. Based on the resource-based theory, it can be said that each company has its own unique resources, and this combination of resources leads to a company’s competitive advantage. It is necessary to secure human resources to carry out R&D by considering the most important of corporate resources as human resources. Based on this logic, this study established the following hypothesis.

**Hypothesis 3.** The company’s R&D Development Intensity will have a positive impact on business performance.

The network concept was initially used in the engineering field. However, since the 1950s, network studies have been conducted in the social science and anthropology field [65]. In recent years, the scope of research has been expanded and defined in organizations. In particular, from the perspective of management, the network is viewed as a link between organizations to improve business performance through the exchange of information with external resources [66]. Networks provide a practical way to procure resources from outside [67]. SMEs are facing a more competitive world and making more efforts to procure resources from the outside [67]. Therefore, networks have a positive effect on helping SMEs achieve economies of scale without creating inefficiency of scale [68].

Possessing an efficient network for utilizing external resources can be used as an effective means for technology-based start-ups to overcome resource constraints and limitations [69]. Researchers who understand external networks as a company’s ability, external networks develop and leverage relationships among organizations [70]. Therefore, external resources can be secured through network collaboration with other companies and external resources secured can be appropriately utilized for management to produce performance [71,72]. Many researchers also agreed that innovation rarely occurs in isolated environments and occurs through interaction among multiple participants [73–75]. Therefore, inter-organizational cooperation has already been evaluated as having an important role in expanding innovation capabilities within the enterprise [76,77]. Through this logic, this study established the following hypothesis.

**Hypothesis 4.** The company’s Cooperation will have a positive impact on business performance.

Bowen [78] defined the social responsibility of entrepreneurs as “entrepreneurs have an obligation to plan their policies and make decisions in the right direction” in the book “Social Responsibilities of the Businessman” and this started the theoretical foundation of CSR and an academic approach began. Afterward, various concepts and definitions were discussed, and the International Organization for Standardization (ISO) developed
ISO 26000 [79], an indicator of social responsibility, extending from the CSR concept at the conventional corporate level to social responsibility (ISO, 2009) [79].

It is essential for companies to pursue economic achievements such as profit for sustainable management. Economic factors of sustainable management have already been discussed in research on CSR and are recognized as an important area of corporate activity today [80]. Previous studies have shown a positive relationship between CSR and business performance [81–86]. First of all, the tool-based stakeholder theory explains that CSR works positively on a company’s financial performance because multiple stakeholders are satisfied by CSR which enhances an organization’s financial performance. Next, in the theory of stakeholder representatives, CSR activities are expected to play a role in monitoring management’s decreased attention to a company’s financial objectives during negotiations and contracts between many stakeholders. In particular, CSR activities solve and balance the needs of various stakeholders and management can efficiently accept external needs, and in this process increase the efficiency of the enterprise [85]. Through this logic, this study established the following hypothesis.

**Hypothesis 5.** The company’s CSR will have a positive impact on business performance.

### 3. Methodology

#### 3.1. Research Model

The purpose of this exploratory study is to analyze the factors affecting the performance of manufacturing venture companies in terms of resilience. This study proposes the following two research questions: (1) What resilience factors impact and how do they impact business performance? (2) Does resilience influence financial performance and non-financial performance differently or similarly? To do so, the proposed research model is shown in Figure 1. As Figure 1 shows, this study considered two types of business performance: non-financial and financial performance. Non-financial performance is measured as technology and financial performance is measured as sales and profit. Also, this study considered resilience as antecedent and measured with five resilience factors: product structure intensity, brand intensity, research and development intensity, cooperation, and corporate social responsibility. Lastly, this study considered business years as a control variable.

![Figure 1. Research Model.](image)

#### 3.2. Research Measurement

Based on the literature review, this study used Howells’ [22] resilience concepts (productivity, agility, connectivity, and sustainability) to analyze the influence of resilience on the business performance of Korean manufacturing venture enterprises. Since this study considers the increase in continuity and scalability of future research on Korean venture resilience, the public survey data was taken from the Venture Business Precision Survey [87] and applied Howells [22] concepts.

This study considered five variables: product structure intensity, brand intensity, R&D intensity, cooperation, and CSR. To measure the variables against the Howells con-
cepts, productivity depends on resilience factors of product structure intensity and brand intensity, while agility is measured by R&D intensity. Connectivity is measured by cooperation, and sustainability is measured using CSR.

For the dependent variable, this study includes two business performance metrics: financial and non-financial performance. Financial performance was measured using sales and profits, while non-financial performance was measured against technology performance as operational performance, and then analyzed as a mediator. Business years were used as control variables. Table 1 summarizes the variables and measurements used in this study.

Table 1. Measurement of Variables.

<table>
<thead>
<tr>
<th>Type of Variables</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong>&lt;br&gt;(Business Performance)</td>
<td>Non-financial Performance&lt;br&gt;(Mediator)</td>
</tr>
<tr>
<td></td>
<td>Technology Performance</td>
</tr>
<tr>
<td></td>
<td>Financial Performance</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product Structure Intensity&lt;br&gt;(Productivity)</td>
</tr>
<tr>
<td></td>
<td>Own Brand Intensity&lt;br&gt;(Productivity)</td>
</tr>
<tr>
<td></td>
<td>R&amp;D Development Intensity&lt;br&gt;(Agility)</td>
</tr>
<tr>
<td></td>
<td>Cooperation&lt;br&gt;(Connectivity)</td>
</tr>
<tr>
<td></td>
<td>CSR&lt;br&gt;(Sustainability)</td>
</tr>
<tr>
<td><strong>Independent variable</strong>&lt;br&gt;(Resilience)</td>
<td>Business Years</td>
</tr>
</tbody>
</table>

3.3. Data

This study used government-approved public data from the Venture Business Precision Survey (2020), which is an annual survey conducted by the Ministry of SMEs and Start-ups and the Korean Venture Business Association. The data was collected on venture-certified companies, with a total of 36,503 samples, and opened to the public data portal (data.go.kr) at the end of December 2019. These are highly reliable and valid survey data.
because their systematically structured questionnaires are directly responded to by the CEO, executives, and managers of the venture firms. This study specifically focused on direct production manufacturing ventures, with 667 ventures included. The characteristics of the samples used in this study are summarized in Table 2.

Table 2. Characteristics of Data.

<table>
<thead>
<tr>
<th>(N = 667)</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>under 3 years</td>
<td>34</td>
<td>5.1</td>
</tr>
<tr>
<td>4–10 years</td>
<td>213</td>
<td>31.9</td>
</tr>
<tr>
<td>11–20 years</td>
<td>288</td>
<td>43.2</td>
</tr>
<tr>
<td>over 21 years</td>
<td>132</td>
<td>19.8</td>
</tr>
<tr>
<td><strong>Product Structure Intensity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 main product</td>
<td>77</td>
<td>11.5</td>
</tr>
<tr>
<td>2–3 main product</td>
<td>238</td>
<td>35.7</td>
</tr>
<tr>
<td>more than 4 main products</td>
<td>352</td>
<td>52.8</td>
</tr>
<tr>
<td><strong>Own Brand Intensity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Brand</td>
<td>353</td>
<td>52.9</td>
</tr>
<tr>
<td>Have Own Brand</td>
<td>314</td>
<td>47.1</td>
</tr>
<tr>
<td><strong>R&amp;D Development Intensity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No affiliated research institute, relevant department, and R&amp;D personnel</td>
<td>54</td>
<td>8.1</td>
</tr>
<tr>
<td>No affiliated research institute and relevant department but have R&amp;D personnel</td>
<td>29</td>
<td>4.3</td>
</tr>
<tr>
<td>No affiliated research institute but has a relevant department</td>
<td>55</td>
<td>8.2</td>
</tr>
<tr>
<td>Have an affiliated research institute</td>
<td>527</td>
<td>79.0</td>
</tr>
<tr>
<td>Have affiliated research institute and overseas local R&amp;D center</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Cooperation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Cooperation</td>
<td>436</td>
<td>65.4</td>
</tr>
<tr>
<td>There is Cooperation</td>
<td>231</td>
<td>34.6</td>
</tr>
<tr>
<td><strong>CSR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No CSR</td>
<td>442</td>
<td>66.3</td>
</tr>
<tr>
<td>Participate CSR</td>
<td>225</td>
<td>33.7</td>
</tr>
<tr>
<td><strong>Technology Performance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>Mean: 20.459, Middle: 9.0, S.D.: 34.830</td>
<td>0, Max: 241</td>
</tr>
<tr>
<td>Profit</td>
<td>Mean: 953.045, Middle: 5479.593, Mini: −38889.0, Max: 64364.0</td>
<td></td>
</tr>
</tbody>
</table>

Frequency analysis results show business year under 3 years 34 (5.0%), 4–10 years 213 (31.9%), 11–20 years 288 (43.2%), and over 21 years 132 (19.8%). Product structure intensity show 1 main product 77 (11.5%), 2–3 main product 238 (35.7%), and more than 4 main products 352 (52.8%). Own brand intensity shows no brand 353 (52.9%) and have their own brand 314 (47.1%). R&D development intensity show no affiliated research institute, relevant department, and R&D personnel 54 (8.1%), no affiliated research institute and relevant department but have R&D personnel 29 (4.3%), no affiliated research institute but have a relevant department 55 (8.2%), have an affiliated research institute 527 (79.0%), and have affiliated research institute and overseas local R&D center 2 (0.3%). As for cooperation: no cooperation 436 (65.4%) and there is cooperation 231 (33.7%). Additionally, for CSR: no CSR 442 (66.3%) and participate in CSR 225 (33.7%). The mean of technology performance 20.459 (S.D. 34,830), the mean of sales 22,998.889 (S.D. 34,761.149) and the mean of profit 953.045 (S.D. 5479.593).

4. Empirical Findings

Prior to analyzing the causal relationships between the factors, this study performed a correlation analysis. The results of the correlation analysis and the mean and standard deviation (S.D.) of the factors are summarized in Table 3. The highest correlation between sales and profit was 0.531.

To analyze the factors affecting business performance, this study conducted a regression analysis for business performance, non-financial (technology performance), and financial (sales and profit). The results are summarized in Table 4.
Table 3. Result of Correlation Analysis.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.78</td>
<td>0.82</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2.41</td>
<td>0.69</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1.86</td>
<td>5.21</td>
<td>0.159**</td>
<td>0.115**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4.38</td>
<td>1.28</td>
<td>0.230**</td>
<td>0.082 *</td>
<td>0.108 **</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.49</td>
<td>0.77</td>
<td>0.074</td>
<td>0.157**</td>
<td>0.171 **</td>
<td>0.232 **</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.38</td>
<td>0.58</td>
<td>0.147**</td>
<td>0.043</td>
<td>0.048</td>
<td>0.141**</td>
<td>0.098 *</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>22,998.89</td>
<td>34,761.15</td>
<td>0.246**</td>
<td>0.052</td>
<td>0.155**</td>
<td>0.181**</td>
<td>0.077 *</td>
<td>0.206 **</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>953.05</td>
<td>5479.59</td>
<td>0.042</td>
<td>−0.034</td>
<td>0.061</td>
<td>0.090 *</td>
<td>−0.045</td>
<td>0.128 **</td>
<td>0.531 **</td>
<td>1</td>
</tr>
</tbody>
</table>

** p < 0.01, * p < 0.05; 1 Business Years, 2 Product Structure Intensity, 3 Own Brand Intensity, 4 R&D Intensity, 5 Cooperation, 6 CSR, 7 Sales, 8 Profit.

Table 4. Result of Regression Analysis.

<table>
<thead>
<tr>
<th></th>
<th>Technology Performance</th>
<th>Financial Performance</th>
<th>VIF</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Business Years</td>
<td>0.221 ***</td>
<td>0.181 ***</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(6.163)</td>
<td>(4.718)</td>
<td>(0.064)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product Structure Intensity</td>
<td>0.087 *</td>
<td>0.011</td>
<td>−0.041</td>
</tr>
<tr>
<td></td>
<td>(2.503)</td>
<td>(0.286)</td>
<td>(−1.052)</td>
<td>H1: Partial</td>
</tr>
<tr>
<td></td>
<td>Own Brand Intensity</td>
<td>0.226 ***</td>
<td>0.105 **</td>
<td>0.064</td>
</tr>
<tr>
<td></td>
<td>(6.384)</td>
<td>(2.782)</td>
<td>(1.629)</td>
<td>H2: Partial</td>
</tr>
<tr>
<td></td>
<td>R&amp;D Development Intensity</td>
<td>0.074 *</td>
<td>0.104 **</td>
<td>0.088 *</td>
</tr>
<tr>
<td></td>
<td>(2.037)</td>
<td>(2.679)</td>
<td>(2.173)</td>
<td>H3: Supported</td>
</tr>
<tr>
<td></td>
<td>Cooperation</td>
<td>0.165 ***</td>
<td>0.004</td>
<td>−0.082 *</td>
</tr>
<tr>
<td></td>
<td>(4.565)</td>
<td>(0.997)</td>
<td>(−2.039)</td>
<td>H4: Rejected</td>
</tr>
<tr>
<td></td>
<td>CSR</td>
<td>0.082 *</td>
<td>0.159 ***</td>
<td>0.122 **</td>
</tr>
<tr>
<td></td>
<td>(2.331)</td>
<td>(4.253)</td>
<td>(3.118)</td>
<td>H5: Supported</td>
</tr>
<tr>
<td></td>
<td>Ad.R²</td>
<td>0.215</td>
<td>0.105</td>
<td>0.024</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>31.489 ***</td>
<td>14.023 ***</td>
<td>3.712 ***</td>
</tr>
</tbody>
</table>

*** p < 0.001, ** p < 0.01, * p < 0.05.

Regarding technology performance, the analysis showed an explained variance of 21.5%. As the results show, all five resilience variables have a significant positive influence on technology performance. In order of significant influence, they are the own brand intensity (0.226), business year (0.221), cooperation (0.165), product structure intensity (0.087), CSR (0.082), and R&D intensity (0.074). In other words, the longer the operating year, the higher the product structure intensity, brand intensity, R&D intensity, cooperation, CSR, and technology performance. These results imply that the overall aspects of resilience (productivity, agility, connectivity, and sustainability) increase technology performance.

Next, financial performance of sales, the results show that the two variables, product structure intensity and cooperation were not significant. The other four variables have a significant positive influence on sales; in order of significance influence, they are business years (0.181), CSR (0.159), own brand intensity (0.105), and R&D intensity (0.104). Put differently, the longer the operating year, the higher the CSR, own brand intensity and R&D intensity increase sales. These results imply that the productivity, agility and sustainability aspects of resilience increase sales.

Finally, financial performance of profit, the results show that the three variables, business years, product structure intensity and own brand intensity were not significant. However, two variables have a significantly positive influence, and one variable has a significantly negative influence on profit. The order of significant influence is CSR (0.122), R&D intensity (0.088), and cooperation (−0.082). Put differently, the higher the CSR, the higher the R&D intensity and the lower the cooperation, the higher the profit. These results im-
ply that the agility and sustainability aspects of resilience increase profit; however, the connectivity aspect of resilience decreases it.

Based on the overall result, among the five hypotheses, one is rejected, two are partial, and two are supported. H1 and H2 are partially supported or partially rejected. H3 and H5 are supported. H4 is rejected.

5. Discussion and Conclusions

While concerns continue regarding the trends of resilience, CE, and RSCs, research on these topics is still in its initial stage, specifically concerning resilient-related research on Korean businesses [4–8,21]. The research on Korean SMEs and venture and manufacturing companies is especially limited [4,6,21], making this study particularly important.

5.1. Managerial Implication

Based on the empirical findings, three implications are discussed for increasing the business performance of Korean manufacturing venture companies. First, to increase both non-financial (technology performance) and financial performance (sales and profit), an increase must occur in R&D intensity and CSR. The study results imply that manufacturing ventures should consider increasing the intensity of R&D from assigned personnel, relevant departments, and research institutes to overseas local R&D centers. In addition, manufacturing ventures should participate in diverse types of CSR, such as donation, talent donation, creating shared value, community service, and sponsorship.

Second, by each performance, to increase technology performance, an increase in product structure intensity, brand intensity, R&D intensity, cooperation, and CSR is important. The study results imply that manufacturing ventures should try to intensify and diversify the number of focused products and their own brands. The results also imply that manufacturing ventures should participate in diverse types of cooperation, including universities (industry-university), research institutes (government-funded, specialized, etc.), SMEs and venture companies, mid-sized companies, large companies, and foreign companies. To increase sales, increasement in brand intensity, R&D intensity, cooperation, and CSR is important. To increase profit, increasing R&D intensity and CSR is important. However, increasing cooperation seems to decrease profits. This conflicting influence of cooperation between technology performance and profit lead to third implication.

Third, the influence of cooperation remains controversial. The results show a positive influence of cooperation on technology performance, but a negative influence on profit. These mixed results imply that a prudent approach is needed for cooperation, where manufacturing ventures should consider the optimum level, or the amount of cooperation as a considerable influence between increasing technology performance and profit. This result may have occurred because the study measured cooperation by the number of organizational types that cooperate with the company. Cooperation among various types seems to have a positive effect on technology performance, as diversity and innovativeness increase new ideas. However, it can be expected that collaboration among various types will also incur management/operation costs in terms of time and effort. Therefore, it can be said that it has a negative effect on profit.

5.2. Theoretical Implications

This study makes two academic contributions. First, it applies the concept of resilience to Korean companies, which has been limited in the existing literature. Therefore, it is expected to expand the RSC research in Korean business studies. Second, this study empirically analyzes the manufacturing venture companies that have been underserved in the existing RSC literature. Few studies have empirically analyzed the relationship between manufacturing venture company performance and resilience. Therefore, this study can serve as a cornerstone for future research.
5.3. Study Limitations

Despite the above implications, this study has three limitations for future studies to overcome. First, this study used and analyzed identical time-measured independent and dependent variables. However, the influence of independent variables can take time to influence the dependent variable. In addition, the dependent variable can influence the independent variable and vice versa. Since the data used in this study are panel data, future studies should consider longitudinal [16] or time series analysis [88]. Second, the influence of cooperation on technology performance and profit remains controversial. Future studies should conduct additional analyses of the black box. Like considering curve estimation analysis [89] between cooperation and profit or adding a moderator in analysis [90]. Similar to Jessin et al. ’s [91] scenario study, analyzing the impact of each cooperation type will provide more meaningful implications for Korean manufacturing venture companies. They tend to have insufficient resources to enable meaningful selective cooperation with SMEs. Third, this study considered performance in two types, technology and financial. However, the relationship between the two is not considered. Therefore, future studies should conduct non-financial performance as a mediator between factors and financial performance like in Beuren et al. [13] and Kang & Stephens’ [21] research.

Even though this study has limitations, it empirically analyzes and finds the resilience factors affecting the business performance of Korean manufacturing venture companies. When SMEs tend to have insufficient resources, resilience can be used as a key resource to adapt to unpredictable and sudden environmental changes. Therefore, the results of this study have management implications for Korean manufacturing venture companies. Additionally, this study considers the continuity and scalability of future research on Korean venture resilience. To expand and extend the Korean venture study, Howells [22] used data and measurements from the Venture Business Precision Survey [87]. In this way, we expect that government-approved public data will enlarge and extend academic applications.


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Conflicts of Interest: The authors declare no conflict of interest.

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