





# “Factors affecting innovation capacity: Empirical evidence from small and medium enterprises in Vietnam”

|                     |                                                                                                                                                                                                                                                                                                                                         |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AUTHORS</b>      | Lien Thi Hoa Do <br>Phuong Vo Hang Hoang <br>Mai Thi Ngoc Nguyen                     |
| <b>ARTICLE INFO</b> | Lien Thi Hoa Do, Phuong Vo Hang Hoang and Mai Thi Ngoc Nguyen (2025). Factors affecting innovation capacity: Empirical evidence from small and medium enterprises in Vietnam. <i>Problems and Perspectives in Management</i> , 23(3), 297-309. doi: <a href="https://doi.org/10.21511/ppm.23(3).2025.22">10.21511/ppm.23(3).2025.22</a> |
| <b>DOI</b>          | <a href="http://dx.doi.org/10.21511/ppm.23(3).2025.22">http://dx.doi.org/10.21511/ppm.23(3).2025.22</a>                                                                                                                                                                                                                                 |
| <b>RELEASED ON</b>  | Tuesday, 19 August 2025                                                                                                                                                                                                                                                                                                                 |
| <b>RECEIVED ON</b>  | Saturday, 04 January 2025                                                                                                                                                                                                                                                                                                               |
| <b>ACCEPTED ON</b>  | Tuesday, 08 July 2025                                                                                                                                                                                                                                                                                                                   |
| <b>LICENSE</b>      | <br>This work is licensed under a <a href="https://creativecommons.org/licenses/by/4.0/">Creative Commons Attribution 4.0 International License</a>                                                                                                    |
| <b>JOURNAL</b>      | "Problems and Perspectives in Management"                                                                                                                                                                                                                                                                                               |
| <b>ISSN PRINT</b>   | 1727-7051                                                                                                                                                                                                                                                                                                                               |
| <b>ISSN ONLINE</b>  | 1810-5467                                                                                                                                                                                                                                                                                                                               |
| <b>PUBLISHER</b>    | LLC “Consulting Publishing Company “Business Perspectives”                                                                                                                                                                                                                                                                              |
| <b>FOUNDER</b>      | LLC “Consulting Publishing Company “Business Perspectives”                                                                                                                                                                                                                                                                              |



NUMBER OF REFERENCES

**44**



NUMBER OF FIGURES

**1**



NUMBER OF TABLES

**4**

© The author(s) 2025. This publication is an open access article.



## BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10,  
Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Type of the article:** Research Article

**Received on:** 4<sup>th</sup> of January, 2025

**Accepted on:** 8<sup>th</sup> of July, 2025

**Published on:** 19<sup>th</sup> of August, 2025

© Lien Thi Hoa Do, Phuong Vo Hang Hoang, Mai Thi Ngoc Nguyen, 2025

Lien Thi Hoa Do, Ph.D., Head of Department of Business and Administration, University of Labor and Social Affairs, Ho Chi Minh City Campus, Vietnam.

Phuong Vo Hang Hoang, MsCom, Department of Business and Administration, University of Labor and Social Affairs, Ho Chi Minh City Campus, Vietnam. (Corresponding author)

Mai Thi Ngoc Nguyen, Master in Global Business, Department of Business and Administration, University of Labor and Social Affairs, Ho Chi Minh City Campus, Vietnam.



This is an Open Access article, distributed under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Conflict of interest statement:**

Author(s) reported no conflict of interest

Lien Thi Hoa Do (Vietnam), Phuong Vo Hang Hoang (Vietnam),  
Mai Thi Ngoc Nguyen (Vietnam)

# FACTORS AFFECTING INNOVATION CAPACITY: EMPIRICAL EVIDENCE FROM SMALL AND MEDIUM ENTERPRISES IN VIETNAM

**Abstract**

This paper aims to assess the relative importance of various determinants impacting small and medium enterprises' (SMEs) capacity for innovation. The study employed a quantitative approach with data obtained from 462 participants working across SMEs in 2023 in Ho Chi Minh City, Vietnam. The collected data were subsequently processed and analyzed using structural equation modeling (SEM) and exploratory factor analysis (EFA). The EFA results indicated the removal of two items due to their poor fit within the variables. Furthermore, the statistical adequacy of the data for factor analysis was confirmed by a Kaiser-Meyer-Olkin (KMO) coefficient of 0.892 and a significant Bartlett's test (Chi-square = 8177.250,  $p$ -value < 0.001). The remaining variables yielded a convergent solution in the subsequent CFA analysis, with goodness-of-fit indices meeting acceptable thresholds. The SEM results revealed four key factors influencing the innovation capability of SMEs in Ho Chi Minh City: collaboration networks, organizational culture, entrepreneurial leadership, and internal human resources, with  $p$ -values for all these factors' estimates of 0.000. The survey respondents indicated that collaborative networks exerted the most substantial influence on the innovation capability of SMEs (with an estimate of 0.282). Subsequently, factors such as organizational culture and entrepreneurial leadership demonstrated progressively lesser degrees of impact, with corresponding coefficients of 0.266 and 0.207, respectively. Recommendations for both enterprises and state policies are then proposed.

**Keywords** factors, innovation, innovation capacity, SMEs, Vietnam

**JEL Classification** L20, L21, M10

**INTRODUCTION**

In the context of globalization and fierce competition, businesses are confronting numerous challenges stemming from rapid technological advancements and increasingly shorter product lifecycles. To ensure survival and sustainable development, innovation capability has emerged as a pivotal factor for enterprises to build competitive advantage (N. Kaur & P. Kaur, 2021; Saridakis et al., 2019; Anning-Dorson & Nyamekye, 2020). This is clearly evidenced by developed East Asian economies such as Japan, South Korea, and Singapore, where robust innovation capabilities have driven technological transformation, thereby fueling overall economic growth (Cirera & Maloney, 2017).

Despite their significant role in local economic development, contributing substantially to job creation, poverty reduction, and economic growth (Gherghina et al., 2020), small and medium-sized enterprises (SMEs) often face more constraints compared to larger corporations. These limitations typically include restricted access to finance, human capital, infrastructure, and managerial competence (Clauss et al., 2022), as well as complex administrative procedures in business

establishment, operation, and development (Eggers, 2020). Consequently, enhancing the innovation capability of SMEs is crucial, as it enables them to establish and maintain competitive advantages while successfully executing their overall development strategies (Rajapathirana & Hui, 2018).

In Vietnam, SMEs are central to the development process. According to the Vietnam Chamber of Commerce and Industry (VCCI), SMEs constitute approximately 98% of all active enterprises, operating across most economic sectors and significantly contributing to GDP and employment. However, Vietnamese SMEs face substantial challenges in adopting automation and digitalization technologies, exhibiting a considerable technological gap compared to more advanced nations. Business expenditure on research and development (R&D) in Vietnam remains lower than in other ASEAN countries, and innovation linkages are weak, characterized by limited collaboration between universities and enterprises in research endeavors (OECD, 2021). These factors collectively indicate a highly constrained innovation capacity among Vietnamese SMEs. Notably, Ho Chi Minh City, which hosts over 30% of the nation's total SMEs, reflects these aforementioned innovation challenges prevalent across Vietnamese SMEs.

Globally, there is a relative scarcity of research focusing on SMEs, particularly in developing countries (Akin-Adetoro & Kabanda, 2021), and assessments of small business innovation capabilities remain insufficient (Saunila, 2020). Similarly, in Vietnam, there is a paucity of direct quantitative studies addressing the factors influencing innovation capability, with a preponderance of qualitative research. To enhance innovation capability within enterprises, it is essential to identify its determinants. These influencing factors, as well as their degree of impact, can vary depending on the specific context, time, and unique characteristics of individual localities and businesses.

---

## 1. LITERATURE REVIEW AND HYPOTHESES

Empirical evidence concerning innovation capabilities in small businesses diverges into two main research streams: viewing innovation as either a process or an outcome (Saunila, 2020). The first stream defines innovation as a process, where innovation capability represents the potential to generate innovative products. Key aspects identified within this perspective include leadership, organizational culture, management, and employee creativity (Saunila, 2017). Conversely, the second research stream considers innovation as an outcome, classifying innovation capability as a multidimensional construct encompassing product, process, organizational, and continuous market innovation (Varis & Littunen, 2010).

The factors influencing innovation in small and medium-sized enterprises (SMEs) are operationalized as those affecting their innovation capability (Makanyeza et al., 2023). Enterprise innovation is dependent on various factors, broadly categorized into internal and external groups (Romijn & Albaladejo, 2002; Edison et al., 2013). This classification is based on the origin of these influencing elements.

Internal factors are those within the control of the enterprise that impact its innovation capability. Prior research has identified several internal factors, such as the organization's creative culture, human capital, financial resources, and the leadership ability of senior managers (Romijn & Albaladejo, 2002; Kang & Park, 2012; Kim et al., 2018; N. Kaur & P. Kaur, 2021; Makanyeza et al., 2023). Human capital, encompassing expertise, skills, and experience (Romijn & Albaladejo, 2002), is essential for an enterprise to ultimately create new products and/or processes. Therefore, quality human capital serves as the starting point for all innovation processes, symbolizing selective learning and knowledge absorption. Innovation activities necessitate the support of a creative working environment, requiring employee empowerment, flexible organizational structures, and encouragement of inter-departmental interaction within the company. An enterprise with an open culture that promotes risk-taking and fosters the sharing of knowledge and novel ideas among employees (Rangus & Slavec, 2017) will enhance its innovation capability. A learning culture tends to deepen understanding at individual, group, and organizational levels, leading to the generation of rich knowledge resources and ultimately improving

the organization's innovation capacity (Hung et al., 2011), as it provides opportunities for learning, collaboration, and encourages employees to create, share, and apply new knowledge for various forms of innovation. Alongside corporate culture, senior leaders also play a pivotal role in fostering innovation by providing a supportive environment and making decisions that enhance creativity and successful knowledge application. Senior leaders help employees address their needs for empowerment, personal achievement, and creativity. Support from senior leadership is crucial for accelerating innovation, enabling organizations to adapt to rapid changes and protect themselves against uncertain environments. Romijn and Albaladejo (2002) suggest that the knowledge and experience of managers/founders in their operational field are highly significant for SMEs, and the leadership ability of senior management is a decisive factor in an enterprise's innovation capacity (Kim et al., 2018). Financial resources also positively affect innovation capability. Insufficient financial resources can impede the ability to innovate (Kim et al., 2018), while the availability of financial resources (Tran et al., 2021) facilitates investment in innovation, and access to finance (N. Kaur & P. Kaur, 2021) positively influences innovation. Thus, the greater a company's financial resources, the higher its innovation capacity.

External factors are those that impact innovation capability but lie beyond the control of the enterprise. Numerous studies have identified external factors affecting enterprises' innovation capability, including government policy, collaboration networks, market demand, field of activity, and geographic area. Among these, external collaboration networks and government policies are critical, drawing significant attention from researchers (Romijn & Albaladejo, 2002; Kang & Park, 2012; Cowling, 2016; Paik et al., 2017; Chen et al., 2017; Pollok et al., 2019; Wang, 2018; Makanyeza et al., 2023). These two factors positively influence the innovation capability of SMEs. Government support is especially useful for SMEs to improve their innovation capacity when they face internal resource shortages. Diverse government impacts include institutional policies on education and training, scientific research and technology transfer, creating a legal environment for issues related to copyright, inventions, intellectual property,

tax incentives, and financial support for innovation projects. Networks enable companies to benefit from the contributions of business partners in their innovation initiatives (Dangelico, 2016; Pollok et al., 2019). The relationships that build a company's network enhance its innovation capacity through collaborations and interactions with organizations such as colleges, universities, research institutions, other companies (Wang, 2018; Kittilaksanawong & Ren, 2013; Kang & Park, 2012), competitors, associations, consulting industries, service providers, customers, and the government.

To assess innovation capability, this study focuses specifically on product innovation, as it is the predominant form of innovation observed in the survey sample of Vietnamese small and medium-sized enterprises. This focus is further supported by the fact that 85% of Vietnamese SMEs report plans for product and service innovation. Moreover, data from the World Bank's Enterprise Survey indicate that Vietnamese SMEs are relatively innovative in terms of both products and processes. Concurrently, the limited expenditure on research and development among these SMEs suggests that most innovations represent "frugal innovation." This often involves minor modifications to existing products to enhance accessibility for low-income customers (OECD, 2021).

Previous studies on factors affecting innovation capacity in SMEs proved that factors such as government policies to support and promote innovation, collaboration networks, internal human resources, corporate culture, corporate leadership, and financial resources influence the innovation capacity of businesses. Therefore, the model of factors affecting the innovation capacity of SMEs in Vietnam is built on these six elements.

The study aims to explore the effects of government policies and SMEs' capabilities on their innovation capacity which are presented in the below proposed hypotheses.

*H<sub>1</sub>: Government policies to support and promote innovation have a positive influence on the innovation capacity of SMEs.*

*H<sub>2</sub>: Collaboration network has a positive influence on the innovation capacity of SMEs.*

- $H_3$ : *Internal human resources have a positive influence on the innovation capacity of SMEs.*
- $H_4$ : *Corporate culture has a positive influence on the innovation capacity of SMEs.*
- $H_5$ : *Business leadership has a positive influence on the innovation capacity of SMEs.*
- $H_6$ : *Financial resources have a positive influence on the innovation capacity of SMEs.*

## 2. METHOD

The sample was selected using a random sampling method. SMEs in Ho Chi Minh City were geographically stratified across its various districts. Subsequently, the economic sectors in which these SMEs operate were identified, encompassing the three principal pillars of the Vietnamese economy: services, industry, and agriculture. The proportional representation of businesses from each sector in the survey sample was allocated based on their respective contributions to Vietnam's Gross Domestic Product (GDP), specifically 50% from services, 40% from industry, and 10% from agriculture.

Survey respondents were then categorized based on the industry of their employing companies.

These respondents included students (full-time, part-time, and doctoral candidates) from the Ho Chi Minh City Campus of the University of Labor and Social Affairs who are currently employed at businesses, as well as entrepreneurs. The entrepreneurs were identified as current partners and former students of the university. Additionally, the research team engaged with business owners through district-level business associations within Ho Chi Minh City.

The requisite sample size was determined using the formula proposed by Hair et al. (2006). This number was then compared with Hoelter's (1983) recommendations to establish the precise sample size for the study. Based on the preliminary evaluation of the measurement scale, there were 29 observed variables. According to Hair et al. (2006), the minimum number of observations required is  $n = 290(10 \times 29)$ . However, a survey of 500 samples was conducted to account for invalid responses, such as incomplete information or non-responses, and to enhance the study's reliability. A convenience sampling method was employed for data collection.

The survey was administered from February 2023 to July 2023, targeting 500 individuals employed across various enterprises in Ho Chi Minh City. Questionnaires were distributed directly to participants, resulting in 462 completed responses out of 500, yielding a high response rate of 92.4%.

**Table 1.** Sample description

| Type of enterprises       | N   | %    |
|---------------------------|-----|------|
| Private Enterprise        | 207 | 44.8 |
| Limited Liability Company | 213 | 46.1 |
| Others                    | 42  | 9.1  |
| Total                     | 462 | 100  |
| Years of establishment    | N   | %    |
| Under 5 years             | 224 | 48.5 |
| From 5 to 10 years        | 187 | 40.5 |
| Over 10 years             | 51  | 11.0 |
| Total                     | 462 | 100  |
| Titles                    | N   | %    |
| Senior manager            | 142 | 30.7 |
| Middle managers           | 320 | 69.3 |
| Total                     | 462 | 100  |
| Sizes                     | N   | %    |
| Micro enterprises         | 305 | 66.0 |
| Small business            | 129 | 27.9 |
| Medium enterprises        | 28  | 6.1  |
| Total                     | 462 | 100  |

Furthermore, secondary data from the General Statistics Office of Vietnam and policy research findings from other organizations were collected to support the analysis and evaluation in this study. A five-point Likert scale was utilized to quantify participants' opinions, structured as follows: 1 – Strongly Disagree; 2 – Disagree; 3 – Neutral; 4 – Agree; 5 – Strongly Agree.

A questionnaire was sent to 500 respondents, of whom 462 responded, a high response rate of 92.4%. The description of the survey is presented in Table 1.

The surveyed enterprises operate in different business sectors, mainly private enterprises. The interviewees are mainly managers or heads of the human resources, business, and technical departments. The surveyed enterprises have been in op-

eration for less than 10 years, mainly small and micro enterprises (accounting for 94% of the surveyed enterprises) (Table 1).

The factors in the model were constructed based on Wallsten (2000), Romijn and Albaladejo (2002), Lau and Ngo (2004), Kang and Park (2012), Ar and Baki (2011), Delgado-Verde et al. (2011), Findik and Beyhan (2015), Santos-Rodrigues et al. (2016), Apanasovich et al. (2016), Barasa et al. (2017), Chen et al. (2017), Aksoy (2017), Wang (2018), Aboramadan et al. (2020), and N. Kaur and P. Kaur (2021). The six factors were found to have an impact on the innovation capabilities of SMEs, such as government policies to support and promote innovation, collaboration networks, internal human resources, corporate culture, corporate leadership, and financial resources. Appendix A presents a description of these factors.

**Table 2.** EFA results

| Variable                         | Factor |       |       |       |       |       |       |
|----------------------------------|--------|-------|-------|-------|-------|-------|-------|
|                                  | 1      | 2     | 3     | 4     | 5     | 6     | 7     |
| CC3                              | 0.894  | –     | –     | –     | –     | –     | –     |
| CC2                              | 0.849  | –     | –     | –     | –     | –     | –     |
| CC4                              | 0.824  | –     | –     | –     | –     | –     | –     |
| CC5                              | 0.719  | –     | –     | –     | –     | –     | –     |
| CC1                              | 0.602  | –     | –     | –     | –     | –     | –     |
| GS3                              | –      | 0.873 | –     | –     | –     | –     | –     |
| GS2                              | –      | 0.846 | –     | –     | –     | –     | –     |
| GS1                              | –      | 0.843 | –     | –     | –     | –     | –     |
| GS4                              | –      | 0.820 | –     | –     | –     | –     | –     |
| FR1                              | –      | –     | 0.858 | –     | –     | –     | –     |
| FR2                              | –      | –     | 0.793 | –     | –     | –     | –     |
| FR3                              | –      | –     | 0.744 | –     | –     | –     | –     |
| FR4                              | –      | –     | 0.735 | –     | –     | –     | –     |
| BL2                              | –      | –     | –     | 0.887 | –     | –     | –     |
| BL1                              | –      | –     | –     | 0.863 | –     | –     | –     |
| BL3                              | –      | –     | –     | 0.765 | –     | –     | –     |
| BL4                              | –      | –     | –     | 0.654 | –     | –     | –     |
| CN2                              | –      | –     | –     | –     | 0.901 | –     | –     |
| CN3                              | –      | –     | –     | –     | 0.841 | –     | –     |
| CN1                              | –      | –     | –     | –     | 0.825 | –     | –     |
| HC3                              | –      | –     | –     | –     | –     | 0.834 | –     |
| HC2                              | –      | –     | –     | –     | –     | 0.761 | –     |
| HC4                              | –      | –     | –     | –     | –     | 0.695 | –     |
| HC1                              | –      | –     | –     | –     | –     | 0.592 | –     |
| IC2                              | –      | –     | –     | –     | –     | –     | 0.931 |
| IC1                              | –      | –     | –     | –     | –     | –     | 0.837 |
| IC3                              | –      | –     | –     | –     | –     | –     | 0.708 |
| Average Variance Extracted (AVE) | 0.616  | 0.715 | 0.615 | 0.636 | 0.733 | 0.527 | 0.69  |
| Cronbach's Alpha                 | 0.9    | 0.909 | 0.875 | 0.898 | 0.817 | 0.869 | 0.884 |
| Composite Reliability (CR)       | 0.887  | 0.909 | 0.864 | 0.873 | 0.901 | 0.814 | 0.868 |

*Note:* GS = Government policy to support and promote innovation; CN = Collaboration network; CC = Corporate culture; BL = Business leadership; HC = Internal human resources; FR = Financial resources; IC = Innovation capacity.

In this study, Cronbach’s alpha, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) were used to test the validity and reliability of the scale. Then, the linear structural modeling techniques (structural equation modeling, SEM) were employed to test factors affecting the innovation capacity of SMEs.

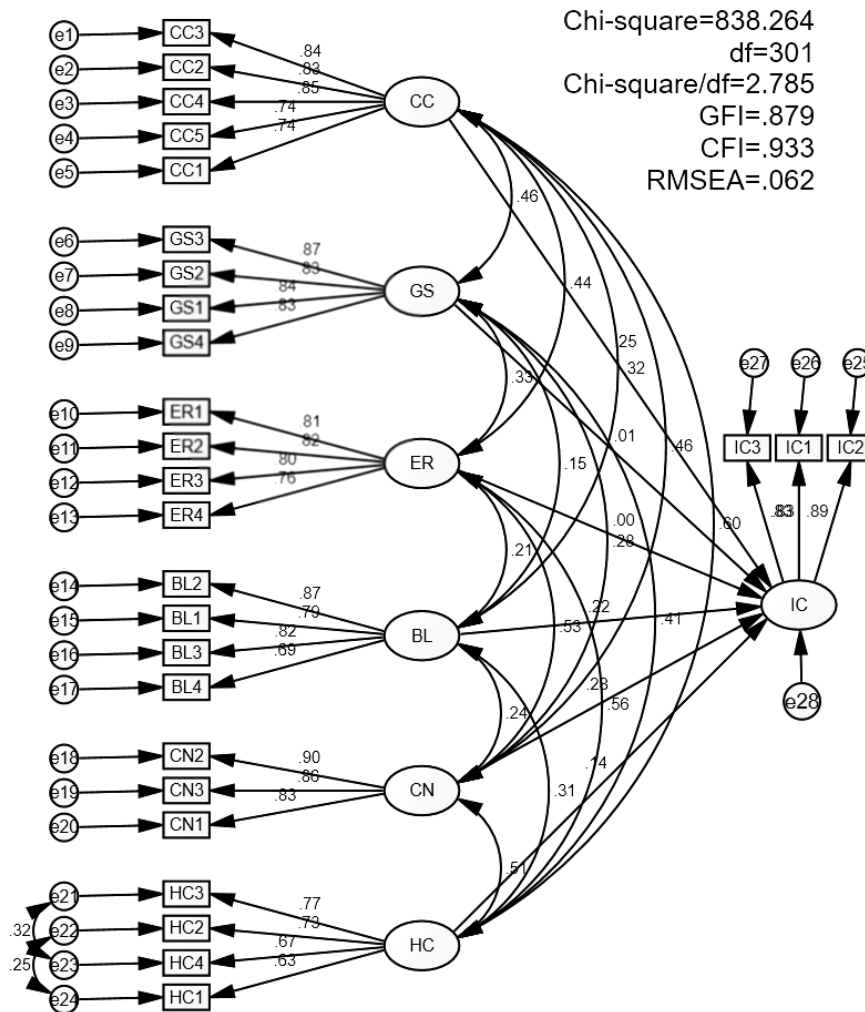
### 3. RESULTS

The exploratory factor analysis (EFA) test suggested the elimination of four items (CC6, GS5, CN4, BL5) with low Cronbach’s alpha. The remaining 27 items of the seven variables met the requirements for the reliability coefficient criteria. The total variance explained of 67.119%, eigenvalue coefficient of 1.172, KMO = 0.892 proved that the

EFA model was reliable. The Chi-square statistic of the Bartlett test is 8177.250 with a significance level of 0.000. Therefore, the observed variables are correlated with each other. Table 2 shows the EFA results.

The CFA model has chi-square = 893.113;  $p = 0.000$ ;  $df = 303$ ;  $chi\text{-square}/df = 2.948$ ;  $CFI = 0.926$ ;  $GFI = 0.871$ ;  $RMSEA = 0.065$ . The model demonstrates a goodness of fit with the data set. This result confirms the unidimensionality of the scales. All observed variables used to measure the research constructs achieved convergent validity.

Table 2 indicates that all scales exhibit adequate composite reliability, and the AVE is greater than 0.5. This signifies that the scales possess high reliability and can effectively account for their re-



Note: GS = Government policy to support and promote innovation; CN = Collaboration network; CC = Corporate culture; BL = Business leadership; HC = Internal human resources; ER = Financial resources; IC = Innovation capacity.

Figure 1. SEM results

**Table 3.** Relationships between factors in the research model

| Relationships |   |    | Estimate | S. E  | C. R  | p-value |
|---------------|---|----|----------|-------|-------|---------|
| CC            | → | IC | 0.266*** | 0.066 | 4.045 | 0.000   |
| GS            | → | IC | 0.013    | 0.047 | 0.286 | 0.775   |
| BL            | → | IC | 0.207*** | 0.042 | 4.874 | 0.000   |
| FR            | → | IC | 0.000    | 0.060 | 0.008 | 0.994   |
| CN            | → | IC | 0.282*** | 0.055 | 5.119 | 0.000   |
| HC            | → | IC | 0.160    | 0.085 | 1.883 | 0.060   |

Note: S.E: standard deviation; C.R: critical value; \*\*\*  $p$ -value < 0.001. GS = Government policy to support and promote innovation; CN = Collaboration network; CC = Corporate culture; BL = Business leadership; HC = Internal human resources; FR = Financial resources; IC = Innovation capacity.

spective research constructs. Furthermore, the extracted constructs demonstrate strong convergent validity with their corresponding scales.

The results show that the theoretical research model (see Figure 1) has chi-square = 838.264 ( $p = 0.000$ ); chi-square/df = 2.785; GFI = 0.879; CFI = 0.933; RMSEA = 0.062. It can be concluded that the model is appropriate for the data set. The coefficients are presented in Table 3.

Thus, Table 3 shows that there are two relationships that are not statistically significant, specifically the relationship between government policy to support and promote innovation and innovation capacity and the relationship between financial resources and innovation capacity. The remaining relationships are statistically significant and have a positive effect. The collaboration network has the strongest influence on innovation capacity. The second important role in governing innovation capacity is corporate culture; business leaders play a lesser role; internal human resources play the lowest role in determining the innovation capacity of SMEs in Ho Chi Minh City.

The results show the accepted the null hypotheses of  $H_2$ ,  $H_3$ ,  $H_4$ ,  $H_5$  while there is insufficient evidence to accept the null hypothesis of  $H_1$  and  $H_6$ .

## 4. DISCUSSION

Research results show the importance of collaborative networks to the innovation capacity of SMEs in Ho Chi Minh City. Accordingly, hypothesis  $H_2$  is accepted. Acquiring new technological knowledge through collaborative relationships and network interactions, especially collaborative relationships with different partners such as

suppliers, customers, competitors, research organizations, and especially foreign partners, will strengthen innovation capacity for SMEs in Ho Chi Minh City. Since most innovation is the result of applying knowledge, not all innovations require invention. It reveals the importance of knowledge learned from other socio-economic organizations through cooperative relationships. SMEs can have more resources to increase their innovation capacity through cooperative relationships. Moreover, while domestic cooperative networks are not capable of supporting SMEs in the learning process to improve their innovation capacity, universities and international research institutes, as well as foreign enterprises, are sources that provide innovative knowledge for SMEs in Ho Chi Minh City. This research result is consistent with the results of Chen et al. (2017), Fındık and Beyhan (2015), and Kang and Park (2012). Therefore, improving innovation capacity for SMEs in Ho Chi Minh City is a good way to strengthen the collaborative network, especially the international collaborative network.

The origin of all creative ideas comes from human thinking and understanding, so quality human resources are the starting point for all innovation processes. It represents learning and selective absorption of knowledge. If the capacity of internal human resources accumulates knowledge over time, it can promote the ability to quickly adapt to market changes, thereby increasing innovation capacity. Thus, hypothesis  $H_3$  is accepted. The results of this study are consistent with the results of previous studies (Chen et al., 2017; Alpan et al., 2010; Hayton & Kelley, 2006; Subramaniam & Youndt, 2005; Romijn & Albaladejo, 2002). Thus, to improve innovation capacity, the indispensable solution is to invest in a high-quality human resource team.

The innovation capacity of the SMEs in Ho Chi Minh City is influenced by the corporate culture factor. Hypothesis H4 is accepted. Corporate culture guides the behavior and actions of individuals through the structure, policy system, procedures, and management orientation of the enterprise. Thus, corporate culture can influence the attitude of the enterprise toward innovation. Other aspects of corporate culture, such as initiative spirit, creativity, risk-taking ability, and teamwork, are considered means to promote innovation. Therefore, diversification, the development of new product/service types, designs, models, and features to meet market demands, can only be achieved when employees in the enterprise are empowered to be creative, encouraged, and work in an open and democratic environment. The results show that there is consistency with that of previous studies that have proved that corporate culture is a factor that promotes innovation (Aboramadan et al., 2020; Delgado-Verde et al., 2011; Lau & Ngo, 2004). Therefore, enterprises need to build a working environment where employees can develop their personal abilities, be creative, and always proactively innovate.

Senior leaders in enterprises need to have a long-term vision, be creative and proactive in participating in innovative projects. Moreover, leaders with good management capacity will help design good policies promoting innovation in enterprises, which can then encourage employees to be innovative. In addition, business leaders applying innovative decisions in business operations are willing to take risks and invest resources in innovation activities. Thus, hypothesis H5 is accepted. The results of the study are also consistent with Tajeddini et al. (2020), Aksoy (2017), Ar and Baki (2011), and Romijn and Albaladejo (2002).

Hypothesis H1 is not accepted. Although international studies by Wang (2018), Chen et al. (2017), Kang and Park (2012), and Wallsten (2000) have proved that the government's innovation support

and promotion policies play a critical role in regulating economic activities through approaches such as subsidies, tax incentives, loan incentives or facilitating the increase of internal R&D resources for enterprises, the Vietnamese government's innovation support and promotion policies have not played their role. Several reasons can be mentioned. First, two state-owned financial funds, the Small and Medium Enterprise Development Fund and the Credit Guarantee Fund, are responsible for financing SMEs; however, few enterprises have access to these funds (OECD, 2021). Second, supporting innovation is a common goal of Vietnam's business support policies, but the barrier of limited support budget has reduced the policy's effectiveness. Innovation policies mainly focus on the supply side, while little attention is paid to building enterprises' innovation capacity to enhance the ability of external technology attainment (demand side) of SMEs (OECD, 2021). Third, while an important factor is improving the quality of human resources, there is no public program to help build the relevant technical skills to improve the innovation capacity of enterprises (OECD, 2021).

Hypothesis H6 is not accepted. However, international studies by N. Kaur and P. Kaur (2021), Apanasovich et al. (2016), and Barasa et al. (2017) all emphasize the role of resources, including financial resources. Financial resources are necessary for enterprises to invest in R&D, technology, and human resources. Nevertheless, SMEs in Ho Chi Minh City are currently facing the problem of a lack of capital for production, investment in R&D, and technology.

The factors of collaborative networks, internal human resources, organizational culture, and entrepreneurial leadership were found to have a significant impact on firms' innovation capability, a result consistent with prior research. However, contrary to the initial hypothesis and previous studies, the factors of government support policies for innovation and financial resources did not demonstrate a significant impact.

---

## CONCLUSION

This study aims to assess the relative importance of various determinants impacting small and medium enterprises' (SMEs) capacity for innovation. The study has built a research model as well as hypotheses about factors affecting innovation capacity in businesses. The research hypotheses were supported through the examination of causal relationships employing structural equation modeling (SEM) and

exploratory factor analysis (EFA). SEM and EFA findings revealed a positive and statistically significant relationship between collaboration network, corporate culture, business leaders, internal human resources, and the innovation capability of SMEs in Ho Chi Minh City. Furthermore, the relationship results between these four factors and the innovation capability of SMEs are aligned with the findings of prior research.

Enhancing collaboration with external organizations, particularly international entities, is essential for obtaining strategic guidance on organizational transformation and accessing high-quality human resources. Small and medium-sized enterprises (SMEs) should proactively engage with relevant associations, such as district and city-level business associations and industry-specific organizations, as well as reputable economic and technical training institutions, including Ho Chi Minh City University of Technology, University of Economics Ho Chi Minh City, Vietnam National University Ho Chi Minh City, and other universities. This engagement will facilitate the acquisition of up-to-date information, expert consultation, and support in identifying technological and product innovation solutions that align with market trends and the enterprise's specific resources.

Cultivating a more cohesive organizational culture that fosters stronger interpersonal connections and inter-departmental collaboration is crucial to ensure that innovation initiatives are effectively directed and yield rapid and substantial results. Small and medium-sized enterprises (SMEs) should actively encourage novel ideas and establish a flexible culture capable of adapting to market dynamics. Furthermore, these enterprises need to foster a culture of innovation within their organizations, thereby stimulating creativity and engagement in business activities. Such policies, aimed at fostering a creative organizational culture, will empower individuals and teams possessing intellectual capacity and a strong passion for innovation to generate unique, differentiated products with high added value.

SMEs in Ho Chi Minh City should place greater emphasis on leveraging the role of their leadership teams and adapting their management methods and models with a proactive and action-oriented approach to bolster their innovation capability. It is necessary to implement and refine lean and efficient management models and methods to maximize accountability and collaboration across different departments within the enterprise.

To enhance the quality of internal human resources, individual employees should prioritize the acquisition of relevant skills to proactively engage in innovative activities within their work. This includes taking initiative and demonstrating a continuous commitment to improving their work performance and pursuing lifelong learning, as individual learning agility remains a crucial factor in responding to rapid technological and environmental changes, ultimately enabling proactive adaptation and transformation. From the organizational perspective, SMEs in Ho Chi Minh City need to align their human resource strategies with their innovation strategies. This necessitates a shift away from short-term profit pressures toward a new mindset focused on attracting talented personnel and fostering continuous training initiatives both internally and externally for employees. Training programs should be informed by national and global human resource development trends and tailored to the specific demands of innovation within the enterprise. Emphasis should be placed on training that is directly integrated with the company's production and business operations, including leveraging government-supported innovation programs.

In terms of the limitations, the study is currently only being conducted in Ho Chi Minh City. Although Ho Chi Minh City is home to the largest number of businesses in Vietnam and contributes the most to the country's GDP, the study should be expanded nationwide. Secondly, a survey conducted solely in Ho Chi Minh City is not fully representative of the entire country. Thirdly, the scope of the study could be broadened to include both SMEs and large enterprises, given the significant contribution of medium and large businesses to the GDP.

## AUTHOR CONTRIBUTIONS

Conceptualization: Lien Thi Hoa Do, Phuong Vo Hang Hoang.

Data curation: Lien Thi Hoa Do, Phuong Vo Hang Hoang.

Formal analysis: Lien Thi Hoa Do.

Investigation: Lien Thi Hoa Do.

Methodology: Lien Thi Hoa Do.

Project administration: Lien Thi Hoa Do.

Resources: Mai Thi Ngoc Nguyen.

Supervision: Lien Thi Hoa Do, Phuong Vo Hang Hoang.

Validation: Mai Thi Ngoc Nguyen.

Visualization: Phuong Vo Hang Hoang, Mai Thi Ngoc Nguyen.

Writing – original draft: Lien Thi Hoa Do, Phuong Vo Hang Hoang, Mai Thi Ngoc Nguyen.

Writing – review & editing: Lien Thi Hoa Do, Phuong Vo Hang Hoang.

## REFERENCES

1. Aboramadan, M., Albashiti, B., Alharazin, H., & Zaidoune, S. (2020). Organizational culture, innovation and performance: A study from a non-western context. *Journal of Management Development*, 39(4), 437-451. <https://doi.org/10.1108/JMD-06-2019-0253>
2. Akin-Adetoro, A., & Kabanda, S. (2021). Factors affecting the adoption of BYOD in South African small and medium enterprises. *The Electronic Journal of Information Systems in Developing Countries*, 87(6), Article e12185. <https://doi.org/10.1002/isd2.12185>
3. Aksoy, H. (2017). How do innovation culture, marketing innovation and product innovation affect the market performance of small and medium-sized enterprises (SMEs)? *Technology in Society*, 51, 133-141. <https://doi.org/10.1016/j.techsoc.2017.08.005>
4. Alpkhan, L., Bulut, C., Gunday, G., Ulusoy, G., & Kilic, K. (2010). Organizational support for intrapreneurship and its interaction with human capital to enhance innovative performance. *Management Decision*, 48(5), 732-755. <https://doi.org/10.1108/02517471080000697>
5. Anning-Dorson, T., & Nyamekye, M. B. (2020). Engagement capability, innovation intensity and firm performance: The role of competitive intensity. *Journal of African Business*, 21, 493-508. <https://doi.org/10.1080/15228916.2020.1790914>
6. Apanasovich, N., Alcalde Heras, H., & Parrilli, M. D. (2016). The impact of business innovation modes on SME innovation performance in post-Soviet transition economies: The case of Belarus. *Technovation*, 57-58, 30-40. <https://doi.org/10.1016/j.technovation.2016.05.001>
7. Ar, I. M., & Baki, B. (2011). Antecedents and performance impacts of product versus process innovation: Empirical evidence from SMEs located in Turkish science and technology parks. *European Journal of Innovation Management*, 14(2), 172-206. Retrieved from <https://www.scirp.org/reference/referencespapers?referenceid=2484826>
8. Barasa, L., Kimuyu, P., Kinyanjui, B., Vermeulen, P., & Knoblen, J. (2017). Institutions, resources and innovation in East Africa: A firm level approach. *Research Policy*, 46(1), 280-291. <https://doi.org/10.1016/j.respol.2016.11.008>
9. Chen, J., Zhu, Z., & Zhang, Y. (2017). A study of factors influencing disruptive innovation in Chinese SMEs. *Asian Journal of Technology Innovation*, 25(1), 140-157. <https://doi.org/10.1080/19761597.2017.1302552>
10. Cirera, X., & Maloney, W. F. (2017). *The innovation paradox: Developing-country capabilities and the unrealized promise of technological catch-up*. Washington, DC: World Bank.
11. Clauss, T., Breier, M., Kraus, S., Durst, S., & Mahto, R. V. (2022). Temporary business model innovation – SME's innovation response to the Covid-19 crisis. *R&D Management*, 52(2), 294-312. <https://doi.org/10.1111/radm.12498>
12. Cowling, M. (2016). You can lead a firm to R&D but can you make it innovate? UK evidence from SMEs. *Small Business Economics*, 46(4), 565-577. <https://doi.org/10.1007/s11187-016-9704-2>
13. Dangelico, R. M. (2016). Green Product Innovation: Where we are and Where we are Going. *Business Strategy and the Environment*, 25(8), 560-576. <https://doi.org/10.1002/bse.1886>
14. Delgado-Verde, M. D., Martin-de-Castro, G. M., & Navas-Lopez, J. E. (2011). Organizational knowledge assets and innovation capability Evidence from Spanish manufacturing firms. *Journal of Intellectual Capital*, 12(1), 5-19. <https://doi.org/10.1108/14691931111097890>
15. Edison, H., Ali, N. B., & Torkar, R. (2013). Towards innovation measurement in the software industry. *The Journal of Systems and Software*, 86(5), 1390-1407. <https://doi.org/10.1016/j.jss.2013.01.013>

16. Eggers, F. (2020). Masters of disasters? Challenges and opportunities for SMEs in times of crisis. *Journal of Business Research*, 116, 199-208. <https://doi.org/10.1016/j.jbusres.2020.05.025>
17. Findik, D., & Beyhan, B. (2015). The impact of external collaborations on firm innovation performance: Evidence from Turkey. *Procedia – Social and Behavioral Sciences*, 195, 1425-1434. <https://doi.org/10.1016/j.sbspro.2015.06.439>
18. Gherghina, S. C., Botezatu, M. A., Hosszu, A., & Simionescu, L. N. (2020). Small and medium-sized enterprises (SMEs): The engine of economic growth through investments and innovation. *Sustainability*, 12(1). <https://doi.org/10.3390/su12010347>
19. Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis*. NJ: Prentice Hall.
20. Hayton, J. C., & Kelley, D. J. (2006). A competency-based framework for promoting corporate entrepreneurship. *Human Resource Management*, 45(3), 407-427. <https://doi.org/10.1002/hrm.20118>
21. Hoelter, J. W. (1983). The analysis of covariance structures: Goodness-of-fit indices. *Sociological Methods and Research*, 11, 325-344. <https://doi.org/10.1177/0049124183011003003>
22. Hung, R. Y. Y., Lien, B. Y. H., Yang, B., Wu, C. M., & Kuo, Y. M. (2011). Impact of TQM and organizational learning on innovation performance in the high-tech industry. *International Business Review*, 20(2), 213-225. <https://doi.org/10.1016/j.ibusrev.2010.07.001>
23. Kang, K. N., & Park, H. (2012). Influence of government R&D support and inter-firm collaborations on innovation in Korean biotechnology SMEs. *Technovation*, 32(1), 68-78. <https://doi.org/10.1016/j.technovation.2011.08.004>
24. Kaur, N., & Kaur, P. (2021). What drives innovation in micro, small, and medium enterprises? *Journal of Public Affairs*, 21(2), Article e2336. <https://doi.org/10.1002/pa.2336>
25. Kim, M. K., Park, J. H., & Paik, J. H. (2018). Factors influencing innovation capability of small and medium-sized enterprises in Korean manufacturing sector: Facilitators, barriers and moderators. *International Journal of Technology Management*, 76(3-4), 214-235. <https://doi.org/10.1504/IJTM.2018.091286>
26. Kittilaksanawong, W., & Ren, Z. (2013). Innovation capability building through intermediary organizations: Cases of manufacturing small-and medium-sized enterprises from China's Zhejiang province. *Asian Journal of Technology Innovation*, 21(2), 62-79. <https://doi.org/10.1080/19761597.2013.819247>
27. Lau, C., & Ngo, H. (2004). The HR system, organizational culture, and product innovation. *International Business Review*, 13(6), 685-703. <https://doi.org/10.1016/j.ibusrev.2004.08.001>
28. Makanyeza, C., Mabenge, B. K., & Ngorora-Madzimure, G. P. K. (2023). Factors influencing small and medium enterprises' innovativeness: Evidence from manufacturing companies in Harare, Zimbabwe. *Global Business and Organizational Excellence*, 42(3), 10-23. <https://doi.org/10.1002/joe.22180>
29. OECD. (2021). *SME and Entrepreneurship Policy in Viet Nam*. Paris: OECD Publishing. <https://doi.org/10.1787/30c79519-en>
30. Paik, J. H., Kim, M. K., & Park, J. H. (2017). The antecedents and consequences of technology standardizations in Korean IT small and medium-sized enterprises. *Information Technology and Management*, 18, 293-304. <https://doi.org/10.1007/s10799-016-0268-2>
31. Pollok, P., Lüttgens, D., & Piller, F. T. (2019). How firms develop capabilities for crowdsourcing to increase open innovation performance: The interplay between organizational roles and knowledge processes. *Journal of Product Innovation Management*, 36(4), 412-441. <https://doi.org/10.1111/jpim.12485>
32. Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. *Journal of Innovation & Knowledge* 3, 44-55. <https://doi.org/10.1016/j.jik.2017.06.002>
33. Rangus, K., & Slavec, A. (2017). The interplay of decentralization, employee involvement and absorptive capacity on firms' innovation and business performance. *Technological Forecasting and Social Change*, 120, 195-203. <https://doi.org/10.1016/j.techfore.2016.12.017>
34. Romijn, H., & Albaladejo, M. (2002). Determinants of innovation capability in small electronics and software firms in southeast England. *Research Policy*, 31(7), 1053-1067. [https://doi.org/10.1016/S0048-7333\(01\)00176-7](https://doi.org/10.1016/S0048-7333(01)00176-7)
35. Santos-Rodrigues, H., Dorrego, P. F., & Jardon, C. F. (2016). The influence of human capital on the innovativeness of firms. *International Business & Economics Research Journal (IBER)*, 9(9), 53-64. <https://doi.org/10.19030/iber.v9i9.625>
36. Saridakis, G., Idris, B., Hansen, J. M., & Dana, L. P. (2019). SMEs' internationalisation: When does innovation matter? *Journal of Business Research*, 96, 250-263. <https://doi.org/10.1016/j.jbusres.2018.11.001>
37. Saunila, M. (2017). Innovation capability in achieving higher performance: Perspectives of management and employees. *Technology Analysis & Strategic Management*, 29(8), 903-916. <https://doi.org/10.1080/09537325.2016.1259469>
38. Saunila, M. (2020). Innovation capability in SMEs: A systematic review of the literature. *Journal of Innovation & Knowledge*, 5(4), 260-265. <https://doi.org/10.1016/j.jik.2019.11.002>
39. Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3), 450-463. Retrieved from <https://journals.aom.org/doi/10.5465/amj.2005.17407911>

40. Tajeddini, K., Martin, E., & Altinay, L. (2020). The importance of human-related factors on service innovation and performance. *International Journal of Hospitality Management*, 85, Article 102431. <https://doi.org/10.1016/j.ijhm.2019.102431>
41. Tran, Q., Doan, A. T., & Tran, T. (2021). Small and medium enterprises' credit access, ownership structure and job development. *Australian Economic Papers*, 60(4), 710-735. <https://doi.org/10.1111/1467-8454.12227>
42. Varis, M., & Littunen, H. (2010). Types of innovation, sources of information and performance in entrepreneurial SMEs. *European Journal of Innovation Management*, 13(2), 128-154. <http://dx.doi.org/10.1108/14601061011040221>
43. Wallsten, S. J. (2000). The effects of government-industry R&D programs on private R&D: The case of the small business innovation research program. *RAND Journal of Economics*, 31, 82-100.
44. Wang, J. (2018). Innovation and government intervention: A comparison of Singapore and Hong Kong. *Research Policy*, 47(2), 399-412. <https://doi.org/10.1016/j.respol.2017.12.008>

## APPENDIX A

**Table A1.** Questionnaire items

| Variable                                                 | Code | Measurement                                                                                                                                                          |
|----------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Government policy to support and promote innovation (GS) | GS1  | The company participates in R&D programs/projects sponsored by the government                                                                                        |
|                                                          | GS2  | Intellectual property rights are legally implemented in Vietnam                                                                                                      |
|                                                          | GS3  | Government policies encourage companies to innovate                                                                                                                  |
|                                                          | GS4  | The government has provided the necessary support for companies to innovate                                                                                          |
|                                                          | GS5  | The government supports companies in training and developing professional human resources for innovation                                                             |
| Collaboration Network (CN)                               | CN1  | The company has cooperated with suppliers, customers, and other companies                                                                                            |
|                                                          | CN2  | The company has created a platform to interact with customers to improve products and services                                                                       |
|                                                          | CN3  | The company collaborates or participates in research projects with domestic and international businesses in the same field                                           |
|                                                          | CN4  | The company collaborates or participates in research projects with domestic and international universities and research organizations                                |
| Corporate Culture (CC)                                   | CC1  | The company always sets goals of providing customer-oriented products/services                                                                                       |
|                                                          | CC2  | The company has a mechanism to reward initiatives applied in practice                                                                                                |
|                                                          | CC3  | The company supports, encourages, and creates conditions for employees to test new ideas                                                                             |
|                                                          | CC4  | The company has a creative working environment that empowers employees                                                                                               |
|                                                          | CC5  | The company encourages interactions between departments, promoting free sharing of knowledge and new ideas                                                           |
|                                                          | CC6  | The company takes the view that the most important success factor in its business is innovation                                                                      |
| Business Leadership (BL)                                 | BL1  | Senior leaders at the company are interested in learning about new technology/processes/product ideas and directly participate in innovation projects at the company |
|                                                          | BL2  | Company leaders have experience working at multinational companies or large domestic companies                                                                       |
|                                                          | BL3  | Company leaders have degrees in business administration/finance                                                                                                      |
|                                                          | BL4  | Company leaders are willing to innovate and take risks                                                                                                               |
|                                                          | BL5  | Company leaders have degrees in science or engineering                                                                                                               |
| Internal Human Resources (HC)                            | HC1  | The company's staff has the capacity to comprehend/absorb new information and knowledge                                                                              |
|                                                          | HC2  | The company has enough technical staff                                                                                                                               |
|                                                          | HC3  | The company's team of engineers is experts in their work                                                                                                             |
|                                                          | HC4  | The company's human resources team is smart and creative                                                                                                             |
| Financial Resources (FR)                                 | FR1  | The company has the financial resources to purchase the equipment needed to produce new products/services                                                            |
|                                                          | FR2  | The company has modern high-tech machinery/equipment required for innovation                                                                                         |
|                                                          | FR3  | The company has a dynamic research and development department/unit                                                                                                   |
|                                                          | FR4  | The company has the ability to access external financing for innovation                                                                                              |
| Innovation Capacity (IC)                                 | IC1  | The company may make significant changes to its existing products/services                                                                                           |
|                                                          | IC2  | The company is likely to introduce a new product/service to the organization                                                                                         |
|                                                          | IC3  | The company has the ability to develop a product with new specifications and functions that are different from existing products                                     |