ASIAN ACADEMY OF MANAGEMENT JOURNAL
VOL. 30, NO. 1, 121–148, 2025
https://ejournal.usm.my/aamj/index e-ISSN: 2180-4184

# IMPACT OF ENTREPRENEURIAL COMPETENCIES AND COOPETITION STRATEGY ON SUSTAINABLE PERFORMANCE: A MODERATED MEDIATION MODEL

**It Nguyen Van**

*Ho Chi Minh City University of Industry and Trade, 140 Le Trong Tan Street, Tay Thanh Ward, Tan Phu District, 70000 Ho Chi Minh City, Vietnam*

E-mail: itnv@huit.edu.vn

**Published online:** 30 June 2025

**To cite this article:** Van, I. N. (2025). Impact of entrepreneurial competencies and coopetition strategy on sustainable performance: A moderated mediation model. *Asian Academy of Management Journal*, *30*(1), 121–148. https://doi.org/10.21315/aamj2025.30.1.5

**To link to this article:** https://doi.org/10.21315/aamj2025.30.1.5

## ABSTRACT

*This study aims to investigate the effects of entrepreneurial competencies and coopetition strategy on sustainable performance, the mediating role of innovation, and the regulatory role of digitalisation capability. Data were collected from 357 leaders at all levels of business in Ho Chi Minh City, Vietnam. The results showed that both entrepreneurial competencies and coopetition strategy had a significant impact on sustainable performance. Additionally, the innovation factor directly affects sustainable performance and positively mediates the relationship between entrepreneurial competencies and sustainable performance. This is the first study to explore the regulatory role of digitalisation capability in the relationship between coopetition strategy and sustainable performance, as well as how digitalisation capability directly affects sustainable performance positively. This research provides intriguing empirical evidence about an under-researched emerging economy in Asia, namely, Vietnam. Furthermore, the results add to the knowledge in the field of business behaviour research and the alignment of linkages between organisational elements to achieve sustainable performance and suggest meaningful management implications and practical meaning for companies in the context of Ho Chi Minh City, Vietnam, in particular, and similar Asian economies, in general.*

**Keywords:** *entrepreneurial competencies, coopetition strategy, innovation, digitalisation capability, sustainable performance*

## INTRODUCTION

Businesses play a crucial role in economic development, generating employment, increasing productivity, and driving global expansion (Ismail, 2022; Oparaocha, 2015). In developing economies, businesses account for over 60% of gross domestic product (GDP) and 70% of employment; in mature economies, they contribute more than 55% of GDP and 65% of employment (Zafar & Mustafa, 2017). In Vietnam, the GDP is projected to grow by 5.05% in 2023, slightly improving from the 2.55% and 2.87% growth rates of 2020 and 2021, respectively (General Statistics Office of Vietnam). The industrial, construction, and service sectors have all experienced positive growth, highlighting the importance of enhanced business performance, innovation (INO), and competencies. However, many businesses in developing countries lack entrepreneurial competencies (EC), which is seen as a significant obstacle to their development, as well as a continuing lag in understanding the nature of INO and its diffusion (Mokbel Al Koliby et al., 2024). According to Bertello et al. (2022) and Chabbouh and Boujelbene (2023), the COVID-19 pandemic has posed significant challenges for businesses, including market conditions and a lack of EC. EC refers to the skills, traits, and knowledge that contribute to the conception, growth, and survival of a business. However, achieving sustainable growth is challenging since many firms rely on analogue resources and operations rather than digital capabilities (DC). In this environment, the COVID-19 pandemic forced businesses to accept disruptive change and give up on outdated thinking while reducing economic development in emerging markets and speeding up DC. Therefore, businesses in emerging markets need to safeguard and enhance their digital skills more and more if they hope to respond to DC and build sustainable performance (SP) (Baudier et al., 2023; Liu et al., 2023). This research underscores the role of digitalisation in enhancing SP, highlighting the importance of digital transformation for businesses. Businesses that embrace digital transformation and adaptability can quickly analyse market data and make informed decisions, gaining a competitive edge in the evolving digital landscape (Cozzolino et al., 2021; Corbo et al., 2023). According to Annarelli et al. (2021) and Wu et al. (2022), to overcome these challenges, businesses must foster a culture of open communication and collaboration, as well as leverage DC to drive INO and operational strategies. Baudier et al. (2023) and Liu et al. (2023) reported that digitalisation can enhance a firm's sustainability and competitiveness, particularly in emerging markets.

In the increasingly competitive business environment, firms constantly seek ways to create sustainable competitive advantages. One solution that previous studies highlighted is coopetition strategy (CS) among firms. Through CS, firms can share resources, knowledge, and risks, thereby fostering product and process INO (Corbo et al., 2023). Crick et al. (2024) demonstrated that CS can bring significant benefits in terms of INO for the participating firms. However, other articles also indicated that CS can create risks and challenges for INO, such as knowledge leakage or limitations on the innovative potential of each party (Rouyre & Fernandez, 2019).

Therefore, a deeper investigation of this complex relationship between CS and INO is highly necessary. This study aims to shed light on the mechanisms and potential limitations in the relationship between CS and INO, thereby providing empirical evidence of value to business managers and policymakers.

This research employs Barney's (1991b) resource-based view (RBV) theory, which suggests that an enterprise's capacity and capital may be used to compete for an edge. EC, which are intangible instruments for attaining organisational economic success, are among the abilities. This idea was applied by Chatterjee et al. (2022) to conclude that the technical and functional capacities of enterprises and big data-driven INO influence supply chain capabilities. Furthermore, using the RBV theory, Jeong and Chung (2023) demonstrated the significance of both internal and external social capital in fostering marketing INO, competitive advantage, and corporate success. Because of its increased application as a metric to quantify SP and increase the value of products, this method promotes sustainable business practices, which may assist in achieving SP (Rashid et al., 2015). The integration of environmental, economic, and social aspects in the decision-making process is crucial for long-term company sustainability and success, as noted by Silvius (2017). This study correctly applies RBV theory to explore the connections between EC, CS, INO, and DC that affect the products of enterprises. Companies should concentrate on finding proactive solutions for problems, including competitive failure, EC, ICS, INO, and DC (Tehseen et al., 2019). The research questions posed by this study are intended to help accomplish the aforementioned research goals:

Q1: What are the interrelationships between EC, CS, INO, DC, and SP?
Q2: Does INO mediate the relationship between EC and SP?
Q3: Does DC moderate the relationship between CS and SP?

This study investigates INO's mediating function in the positive link between EC and SP in the setting of developing economy enterprises and the beneficial influence of EC on SP. The study also tested the hypothesis that CS and that DC serves both as a regulatory and a direct influence in the relationship between DC and the goods produced by companies in the economy.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Today's businesses need to understand how environmental management can help them achieve long-term financial success and strive for it. Companies have long understood that to increase performance and obtain a competitive edge, they must manage their resources well. According to Barney (1991a), the RBV hypothesis has been the foundation for theories that predict variables that assist effective resource management in achieving performance. The RBV theory clarifies the significance of allocating both internal and external resources and how resource management may help firms stand out from the competition and achieve enhanced

performance. In today's corporate world, when environmental and technical improvements take center stage, it can be challenging to maintain a competitive edge or to achieve continuous performance. Environmental practices influence how well businesses function and draw interest from stakeholders. Moreover, some earlier researchers questioned the RBV theory for failing to consider the firm's external environment. To gain a competitive edge, Hart (1995) developed the natural RBV (NRBV) hypothesis, which considers environmental sustainability and sustainability. As stakeholder pressure pushes firms to be more proactive in safeguarding the environment, this argument becomes even more crucial. The idea of corporate social responsibility also drives the implementation of the NRBV theory (Lopez-Becerra & Alcon, 2021).

As such, companies should no longer rely just on resource commitment to gain competitive advantage and success. Due to its limitations, RBV theory cannot provide businesses with more direction toward adjusting to the demands of a complex and dynamic stakeholder environment. According to Michalisin and Stinchfield (2010), the limitations of RBV can be overcome by applying NRBV, which considers activities and the variety of limits imposed by natural resources. The environment is the primary force influencing performance. To help companies cut operational expenses by lowering emissions and improving other processes, Hart (1995) recommended three techniques for businesses to prevent pollution. The second tactic is supply chain integration-based product management, which gives companies a financial edge over competitors by cutting lifetime costs. The third tactic, sustainability, aims to establish the company as a leader in the sector by reducing environmental hazards and fostering a common goal with other industry participants. While NRBV theory explains how environmental management practices help firms sustain their competitive edge and performance, knowledge expansion remains incomplete. It cannot distinguish itself from the resource commitment concepts described by NRBV and RBV theories. This article examines the connections between the SP's components.

## Relationship Between EC, INO, and SP

According to Du et al. (2022), SP is the culmination of environmental, economic, and social performance that benefits the natural and social surroundings, as well as a company's competitive advantages and sustained economic benefits. A company's positive internal and external environmental effects as a result of its sustainable operations are reflected in its spiritual sustainability performance (Rao & Holt, 2005). In addition, according to Mokbel Al Koliby et al. (2024) and Lingappa et al. (2023), it has been determined that for small and medium enterprises, EC has a strong positive impact on SP. According to Laosirihongthong et al. (2013), it necessitates lowering air pollution, energy usage, material utilisation, and adherence to environmental regulations. Businesses must innovate to increase

profits (Chen et al., 2018), stand out from the competition, and gain a competitive advantage (Agyapong et al., 2017). INO is a dynamic mechanism that drives sustainable competitive advantage and economic development for individual firms and countries. According to Eltayeb et al. (2011), an organisation achieves sustained economic success when its market share grows and its position is strengthened, resulting in benefits and returns on investment. As per Abdul-Rashid et al. (2017), other eco-friendly products must have exceptional consistency with ecological standards and be well-designed with recyclable, reusable, and repairable goods and packaging. They also need to reduce carbon emissions, wastewater, extreme waste, energy consumption, and the use of hazardous synthetic compounds and materials. The ability of a business to enhance social well-being by caring for the safety and welfare of both its workforce and the general public is referred to as social SP (Paulraj, 2011). It improves stakeholder and community interactions, labor safety, the working environment, and the living conditions of nearby communities, according to other studies. Companies that want to accomplish a thorough integration of environmental, economic, and social goals must have an effective sustainability performance (Afum et al., 2020).

The amount of knowledge, abilities, and attitudes necessary to establish, organise, and oversee a firm and all of its associated risks is referred to as entrepreneurial competency (Novojen & Birnaz, 2019). Since they work together to provide firms with a competitive edge, these skills aid entrepreneurs in creating lucrative and long-lasting enterprises (Okolie et al., 2021). According to Tehseen et al. (2019), personal traits, including connection orientation, conceptualisation, commitment, opportunity perception, and strategic and organisational ability, are competencies linked to effective work performance. Additionally, the firm's profile, including INO capability and the human, organisational, and demographic characteristics of its members, influences the development potential and the actual growth of knowledge-intensive enterprises (Kotsopoulos et al., 2022). Entrepreneurial experience helps identify business opportunities, form business visions, develop business models, create business strategies, and accelerate the enterprise (Amini Sedeh et al., 2022). Umar et al. (2018) stated that these various business talents and qualities are significant in promoting INO because they mitigate, if not completely eradicate, the detrimental impacts of INO obstacles. Al Mamun et al. (2016) document that entrepreneurial qualities are thought to be the most significant predictors of the success and long-term growth of enterprises. Taking business capability capacities into consideration, we used RBV in this study to forecast organisations' INO and SP (Le & Mai, 2025).

As an organisation adjusts to changes in the environment, INO introduces new ideas, processes, services, or products. It may also be thought of as the application of an idea, technique, service, or new service or product (Shamsuddin, 2014). Being a pioneer in the market for new goods and services is critical to a company's

success since INO is widely acknowledged as being fundamental to ensuring the sustainability and growth of firms' sustained business success (Yustian et al., 2021). One of the primary forces behind economic progress is inventive entrepreneurship (Amini Sedeh et al., 2022). Prior research (Varadarajan, 2017) recognised sustainability as a valuable resource for competitive company performance. To remain competitive in the global economy, firms must innovate by discovering new methods to operate, a necessity brought about by the intense rivalry created by globalisation and the expansion of regional enterprises (Chen et al., 2018). Companies arguing that INO is a crucial factor in driving company competitiveness and that it is closely related to organisational structures, procedures, and processes support INO as a means of enhancing market competitiveness, products, services, and business processes (Yan, 2022).

Additionally, Umar et al. (2018) found a high and favourable correlation between INO and company success, as well as between business competencies and INO. Similar findings were made by Mohammadkazemi et al. (2016), who discovered that creative and prosperous firms typically have great entrepreneurial talents. Furthermore, it has been demonstrated that INO mediates the relationship between social capital and company performance (Agyapong et al., 2017); additionally, it has been shown to mediate the relationship between organisational performance within internationalised enterprises and the degree of internationalisation (Pouresmaeili et al., 2018). Additionally, INO mediates the relationship between cross-functional orientation and performance, as well as the relationship between customer orientation and performance (Bamfo & Kraa, 2019), Also, if the business has sustainable strategic management, the role of INO has an impact on promoting product growth (Koomson, 2025). Accordingly, INO capacity acts as a mediator in the connections between SMEs' sustainability and their ability to access resources, as well as between SMEs' sustainability and their ability to obtain information (Imran et al., 2019). Nevertheless, prior research has not thoroughly examined the function of INO as a mediator in the relationship between entrepreneurial qualities and business performance (Umar et al., 2018). This study confirms the following based on the findings of earlier research:

H1: EC has a positive impact to SP.
H2: EC has a positive impact on INO.
H3: INO is a positive impact to SP.
H4: INO mediates the relationship between EC and SP.

## Relationship Between CS, INO, DC, and SP

According to Abubakar (2024) and Manzhynski et al. (2025), a business that wants to achieve SP needs to increase CS. The impact of CS on SP's ability to depend on INO recovery ability has been analysed (Lv et al., 2025). Businesses

should leverage their DC to promote open INO, build collaborative strategies, and provide economic and social value in order to achieve sustainable success. Many companies have made it their mission to reduce environmental issues while simultaneously generating social value and economic growth in order to promote sustainability (Shahzad et al., 2020). Businesses seem to need sustainable growth in order to maintain a competitive edge in a highly competitive global market (Foss & Saebi, 2017). Businesses will find themselves in a difficult situation in the future as a result of fundamental changes brought about by digitalisation, which are altering the nature of corporate competitiveness and value generation (Kennedy et al., 2017), establishing new company plans, and boosting sustainability in order to compete in the current market. Therefore, for sustainable organisations looking to make a beneficial impact on the environment and society, open INO through DC and collaborative methods is even more crucial (Kazancoglu et al., 2021). Profitable growth outcomes for a business are correlated with productivity or efficiency and, more importantly, with the principles that spur this INO. According to Allal-Chérif et al. (2023), these values can be social or environmental, and they promote sustainable INO for long-term, sustainable growth. To achieve this, companies must improve their digital skills in order to create suitable platforms that can promote market players' cooperation and open INO to the public. According to Christ et al. (2017), cooperative sustainability initiatives provide businesses with a boost to generate greater social and economic value. Furthermore, a number of studies revealed that collaboration improves financial performance (Mantena & Saha, 2012), competitive advantage (Bouncken & Fredrich, 2012), and the development of economies of scale (Bengtsson & Kock, 2000).

The contemporary corporate landscape is characterised by a blend of rivalry and collaboration among enterprises (Roh et al., 2022). Compared to rivals in mature markets, emerging markets frequently lack resources, making them more reliant on other competitors in the external environment (Singh, 2009). They are in a unique position to eventually overcome these weaknesses by working in tandem with the governments of both their home and host countries, as well as global rivals (Kedia et al., 2016). Corbo et al. (2023) demonstrated that INO may result in the creation of sustainable value when collaboration across firms fosters connection and cooperation. Prior research revealed a connection between a company's open INO and sustainability (Kennedy et al., 2017). These relationships were interpreted in terms of the intensity of competition and collaboration (Park et al., 2014). A company's value propositions are increasingly shifting from rivals to partners to co-create value because of the openness and importance of DC (Esposito De Falco et al., 2017).

Additionally, businesses may increase their competitive edge and perform more transparent and creative experiments thanks to digitisation (Blackburn et al., 2017). Bouncken et al. (2018) stated that radical INO can be significantly aided by high levels of cooperation. Moreover, Bacon et al. (2020) reported that cooperation is essential to opening INO since it gives businesses access to outside knowledge sources. According to a prior study, opening INO in various sectors is significantly influenced by cooperation (Corbo et al., 2023). These talks suggest that adopting a cooperative approach in developing nations might support an open INO for two main reasons. First, cooperative approaches can improve the opening of the INO by giving different players in developing markets access to complementary resources (Lew & Sinkovics, 2013). Companies that adopt a cooperative approach in developing nations may encourage open INO by sharing information and resources with ecosystem members and filling gaps in their skills (Qi et al., 2019). Second, by engaging with developing market participants on collaborative methods, businesses may lessen ambiguity about their business practices and foster an open INO (Masucci et al., 2020). Political, economic, and legal divides in the business environment, as well as institutional concerns, can make it challenging for firms to advance (Roh et al., 2021). In emerging markets, this may be high (Nuruzzaman et al., 2020). By welcoming newcomers, businesses can grow and become more legitimate. Consequently, an organisation's value proposition and strategic behaviour are altered by DC, and open INO is greatly aided by the choice and use of collaborative methods (Wu et al., 2022). After reading the preceding debate, it is anticipated that companies will look for DC in their cooperation plans and will support cooperation strategies that foster open INO in emerging markets.

## The Moderating Role of DC

According to Nylén and Holmström (2019), firms may enhance their ability to perceive and seize business opportunities by employing novel digital devices and platforms to gather information on evolving consumer behaviour in various markets and settings. Digitalisation skills allow firms to respond more quickly and diversely by enabling resource reconfiguration (Warner & Wäger, 2019). Examples include improving current processes and resource efficiency. As per Mikalef et al. (2018), realigning pertinent business processes entails expanding into new markets, enabling companies to expand and acquire new benefits. The application of big data analytics has been shown to have an impact on Indian manufacturers' sustainable business performance, according to research by Raut et al. (2019). Paul et al. (2021) explained that blockchain technology significantly improves the sustainability performance of the Indian tea business. Furthermore, firms may get operational data in real time through digitisation, which can be used to anticipate greenhouse gas emissions, remotely monitor equipment, implement green practices, and improve environmental performance and educational

institutions (Chiarini, 2021). Concurrently, Nayal et al. (2022) displayed that the circular economy will be aided by the digitalisation of supply networks through the use of artificial intelligent (AI) and internet of things (IoT). In comparison, companies that use DC to achieve SP frequently develop digital platforms, bringing together a wide range of stakeholders and encouraging open INO in the process (Gawer, 2022). Businesses may build and organise digital platforms that promote open INO by utilising DC. Digital skills have a tremendous open-access impact that helps organisations operate better (Parida et al., 2019). Numerous scholarly investigations demonstrated that corporations foster digitally driven open INO and digital competencies are linked to SP (Li, 2022). In general, the research postulates that companies may more rapidly set themselves apart from rivals by utilising DC. As a result, the following connections are conjectured:

H5: CS has a positive impact to SP.
H6: CS has a positive impact on INO.
H7: DC has a positive impact to SP.
H8: DC moderates the relationship between CS and SP.

According to resource-based theory (RBT), a business's resources are the source of competitive advantage. In addition to the results and limitations of the previous empirical research mentioned above, we combined expert discussions on factors affecting SP in the specific context of businesses in Ho Chi Minh City, Vietnam. This study conducts a test, as shown in Figure 1, including eight hypotheses:

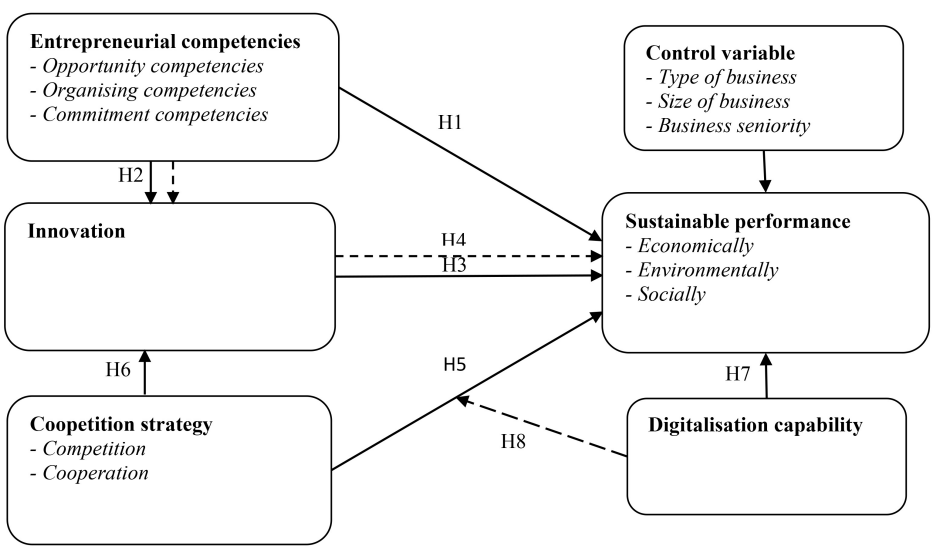


***Figure 1***. Theoretical model

*Note*: H1, H2, H3, H5, H6, H7 = direct effect; H4 = mediates effect; H8 = moderates effect

## RESEARCH METHODOLOGY

### Instrument Development

The research utilised a survey approach, with items taken from relevant previous studies. There are two sections to the questionnaire. The first division includes demographic information about the participants, such as business size, business seniority, and working position. The subsequent portion has 39 questions designed to extract respondents' opinions of EC, CS, INO, DC, and SP. The EC is assessed using 10 questions, which are derived from Mokbel Al Koliby et al. (2024) and are categorised as opportunity competencies, organising competencies, and commitment competencies. Consequently, CS is created through competition, cooperation, and next-generation viewpoints. It is evaluated using eight elements, each of which is derived from Lee and Roh (2023), Czakon et al. (2020), and Riquelme-Medina et al. (2022). Like INO, Mokbel Al Koliby et al. (2024) also used five factors from the scales produced by Lee and Roh (2023) and Nasiri et al. (2020). However, DC is assessed using only four questions. Lastly, SP is constructed using 12 scales based on a study by Mokbel Al Koliby et al. (2024) on three dimensions, namely, economic, environmental, and social, and has been specifically demonstrated in. The study was conducted using a five-point Likert-type scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree) to estimate all measures.

### Data Collection and Sampling

The present study focuses on Ho Chi Minh City enterprises since this is Vietnam's biggest city. Moreover, almost 10% of the nation's population resides there. This study's primary objective is to gather survey responses from managers and business owners at all levels; each company is only represented once in the survey. The self-administered survey items for the study were dispersed fairly, accounting for the variety and size of businesses. In total, 450 questionnaires were sent out. After the distribution of the surveys through in-person interactions, 400 were returned. Following the removal of incomplete replies, 357 questionnaires with a 79.3% completion rate were deemed appropriate for additional examination. This shows an acceptable amount of participation, above Nulty's (2008) criteria for a pen survey. In order to eliminate bias and maintain fairness, a basic random sampling approach was selected. The face-to-face questionnaire was provided impartially to each participant in the form of a sealed envelope. Within two months, the completed surveys were gathered. Table 1 provides an overview of the participants' demographic makeup.

***Table 1***
Profile of participant demographic

| Item | Characteristics | Frequency | Percentage |
|---|---|---|---|
| Type of business | Private enterprise | 33 | 9.2 |
| | Co., Ltd | 123 | 34.5 |
| | Joint stock company | 142 | 39.8 |
| | Other | 59 | 16.5 |
| Working position | Managers | 281 | 78.7 |
| | Owners | 76 | 21.3 |
| Size of business (people) | From 10 to 99 (Small) | 89 | 24.9 |
| | From 100 to 199 (Medium) | 213 | 59.7 |
| | More than 200 (Large) | 55 | 15.4 |
| Business duration | Less than 5 years | 125 | 35.0 |
| | 5 to 10 years | 183 | 51.3 |
| | More than 10 years | 49 | 13.7 |

## RESULTS AND DISCUSSION

### Empirical Analysis

The research employs a two-part technique that combines the Structural Equation Modeling-Artificial Neural Network (SAM-ANN) approach. Initially, the conceptual model's linkages were closely examined using the SEM approach. Furthermore, ANN is used to assess the significance of exogenous structures in forecasting endogenous structures is assessed. PLS-SEM works well with complicated models that include several structures (Urbach & Ahlemann, 2010). According to Lee et al. (2020), the multivariate pre-analysis assessed assumptions such as multi-collinearity, linearity, and normality to guarantee robustness. Analysis of variance (ANOVA) was used to determine how linear the correlations were, and the results showed two nonlinear associations (see Table 2).

This table presents the results of ANOVA tests to assess whether the relationships between the main constructs EC, INO, CS, DC, and SP are linear or nonlinear. The purpose is to verify the assumption of linearity before proceeding with SEM. As shown, the significance values ($p < 0.05$) indicate that the relationships are nonlinear, justifying the adoption of advanced SEM-ANN analysis in the subsequent sections.

***Table 2***
ANOVA summary

| ANOVA-table | Linearity assessment | Sum-of-squares | Df. | Mean-square | F. | Sig. | Linear/ nonlinear |
|---|---|---|---|---|---|---|---|
| SP*EC | Deviation-from-Linearity | 131.311 | 172 | 0.859 | 1.543 | 0.003 | No |
| SP*INO | Deviation-from-Linearity | 145.653 | 138 | 1.243 | 1.847 | 0.000 | No |
| SP*CS | Deviation-from-Linearity | 21.533 | 28 | 1.075 | 1.085 | 0.001 | No |
| SP*DC | Deviation-from-Linearity | 32.432 | 19 | 1.645 | 1.465 | 0.004 | No |

*Note:* Df. = degrees of freedom; F. = F-statistic; Sig. = *p*-value

## Evaluation of the Measurement Model

The study assesses its validity and reliability using the PLS approach with standard setups. The findings in Table 3 provide specifics on convergent validity and reliability. These results unequivocally demonstrate the composite reliability, overall reliability, and Cronbach's alpha values, as demonstrated in the study by Leong et al. (2020). Both indices were over the 0.7 criterion, indicating a high level of measurement model dependability. Additionally, Leong et al. (2018) showed that the average variance extracted (AVE) values were greater than 0.5, supporting the scales' convergent validity.

***Table 3***
Overview of tests for reliability and convergent validity

| Constructs | Cronbach's alpha | Composite reliability | Indicator reliability | AVE |
|---|---|---|---|---|
| CS | 0.831 | 0.854 | 0.864 | 0.551 |
| DC | 0.889 | 0.898 | 0.923 | 0.750 |
| EC | 0.843 | 0.844 | 0.876 | 0.616 |
| INO | 0.922 | 0.926 | 0.941 | 0.763 |
| SP | 0.768 | 0.913 | 0.772 | 0.725 |

The Fornell–Larcker criterion and heterotrait-monotrait ratio (HTMT) were both included in the entire strategy used to evaluate discriminant validity. The square root values of AVE on various architectures are clearly displayed by the diagonal elements, providing a detailed description of the findings obtained by applying the Fornell-Larcker criteria. It is crucial to stress that these values repeatedly show more substantial evidence of discriminant validity than the pertinent correlations seen with other variables. The HTMT ratio is similarly displayed in Table 4, where it remains consistently below the 0.9 threshold. The existence of discriminant value in the framework is absolutely confirmed when the HTMT ratio is less than 0.9, as Henseler et al. (2015) explained in detail.

***Table 4***
Heterotrait-monotrait ratio (HTMT)

| | CS | DC | EC | INO | SP | DC*CS |
|---|---|---|---|---|---|---|
| CS | – | | | | | |
| DC | 0.432 | – | | | | |
| EC | 0.156 | 0.144 | – | | | |
| INO | 0.382 | 0.427 | 0.136 | – | | |
| SP | 0.522 | 0.587 | 0.337 | 0.524 | – | |
| DC*CS | 0.079 | 0.131 | 0.071 | 0.136 | 0.284 | – |

## Test of Hypotheses

Table 5 presents the structural equation model's findings, and Figure 2 gives the PLS results of the hypothesis tests. With $\beta$ = 0.056, $t$ = 4.825, and $p$ = 0.000, the results demonstrate the significance and positive association between EC and SP. H1 is accepted in the current investigation. Subsequently, $\beta$ = 0.091, $t$ = 1.709, and $p$ = 0.000 indicate a positive and statistically significant association between EC and INO, supporting H2. The results further support the acceptance of H3, showing that INO positively affects SP and is statistically significant by $\beta$ = 0.310, $t$ = 5.371, and $p$ = 0.000. H4 is acceptable since the study also demonstrated a significant mediating impact of INO in the association between EC and SP by $\beta$= 0.282, $t$ = 3.205, and $p$ = 0.001 Furthermore, the research findings show that H5 is accepted with coefficient and significant levels of $\beta$ = 0.201, $t$ = 2.186, and $p$ = 0.000, indicating that CS influences SP favourably. INO is impacted by CS by $\beta$ = 0.385, $t$ = 8.646, and $p$ = 0.000, indicating that H6 is approved. The latter two, H7 and H8, are accepted by the coefficients $\beta$ = 0.430, $t$ = 4.921, and $p$ = 0.000 and $\beta$ = 0.108, $t$ = 6.824, and $p$ = 0.003, and DC has a direct influence on SP and a positive moderating function between the link between CS and SP.

***Table 5***
Test results

| Hypothesis | Path | $\beta$ | SE | $t$-value | $p$-value | CI (95%) | $f^2$ | Result |
|---|---|---|---|---|---|---|---|---|
| H1 | EC → SP | 0.056 | 0.012 | 4.825 | 0.000 | [0.033, 0.079] | 0.69 | Supported |
| H2 | EC → INO | 0.091 | 0.020 | 4.550 | 0.000 | [0.051, 0.131] | 0.62 | Supported |
| H3 | INO → SP | 0.310 | 0.058 | 5.371 | 0.000 | [0.251, 0.369] | 0.53 | Supported |
| H4 | EC → INO → SP | 0.282 | 0.088 | 3.205 | 0.001 | [0.106, 0.458] | 0.23 | Supported |

(*continued*)

***Table 5*** (*continued*)

| Hypothesis | Path | $\beta$ | SE | *t*-value | *p*-value | CI (95%) | $f^2$ | Result |
|---|---|---|---|---|---|---|---|---|
| H5 | CS → SP | 0.201 | 0.092 | 2.186 | 0.000 | [0.109, 0.293] | 0.05 | Supported |
| H6 | CS → INO | 0.385 | 0.045 | 8.646 | 0.000 | [0.340, 0.430] | 0.45 | Supported |
| H7 | DC → SP | 0.430 | 0.087 | 4.921 | 0.000 | [0.343, 0.517] | 0.51 | Supported |
| H8 | DC × CS → SP | 0.108 | 0.016 | 6.824 | 0.003 | [0.092, 0.124] | 0.07 | Supported |

*Note:* SE = Standard Error; CI = 95% Confidence Interval (bootstrap); $f^2$ = Cohen's effect size

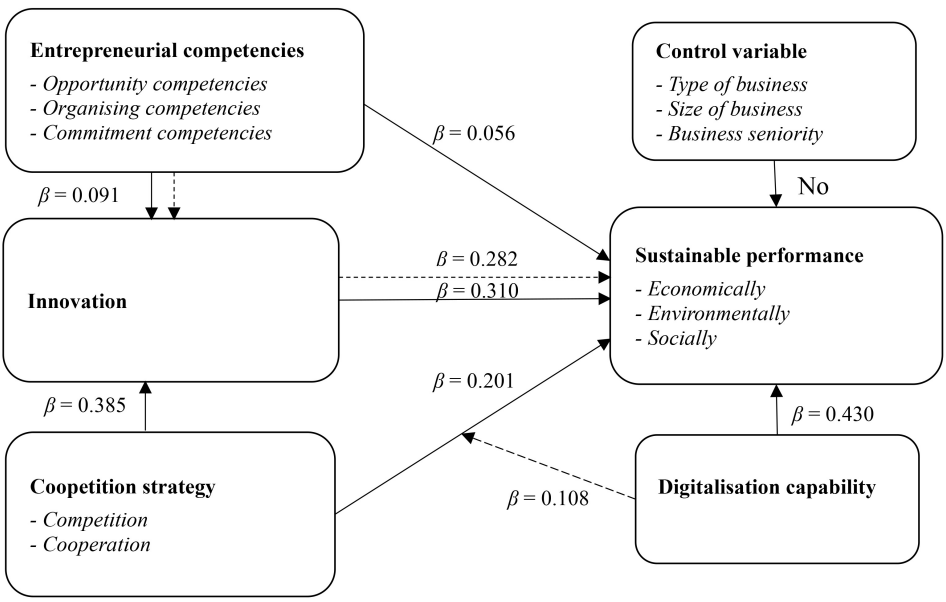


***Figure 2.*** Results of structural model

According to this study, SP is positively impacted by the relationship between EC, CS, INO, and DC. First, this study confirms that EC has a significant impact on firms' INO. The findings imply that firms desire INO to be the first to market with new products, and this aspiration is reflected in the deployment of active ECs to SPs. These capabilities enable them to scan the environment effectively, capture high-quality business opportunities, and leverage R&D to produce products that meet customer needs. Furthermore, when firms have the flexibility to assess the costs and benefits of strategic actions, they tend to use INO in their business operations. They are also able to explore long-term challenges and opportunities,

as well as redesign their businesses to achieve long-term goals better. By continuously monitoring progress, they ensure that the business remains focused on its strategic goals. In this way, various ECs were found to have a direct impact on firms' INO capabilities. Chabbouh and Boujelbene (2023) reported that EC and INO may augment SP. According to Amini Sedeh et al. (2022), ECs are becoming more and more crucial for INO entrepreneurship since they assist INOs in overcoming a variety of challenges comparable to the results of other research. The study also found that EC has a significant direct impact on a firm's SP. The outcomes revealed that firms' SP is enhanced when they are able to protect the interests of their stakeholders while trading environmentally responsible products. They are also able to interact effectively, build long-term trusted relationships, and maintain professional networks, all of which contribute to SP. Innovative EC equips firms to manage risks, view new problems as opportunities, and make critical strategic decisions to deliver value-added products to customers. This significant discovery aligns with the results of Al Mamun et al. (2016), which determined that INO was the most important predictor of company success and sustainable growth. Furthermore, this study found that INO has a significant impact on enterprises' SP. Similar to the research of Yustian et al. (2021), the key finding suggests that businesses benefit from increased profitability, profits, and return on investment, as well as improved market position, when they support INO in business operations and test new methods and ideas in a sustainable way to gain a competitive advantage. Furthermore, an extra experiment was conducted to ascertain the degree of INO's mediating function in the connection between EC and SP. The findings suggest that EC, in conjunction with the INO factor, is a crucial prerequisite for enhancing company goods and resolving business-related issues. Companies should utilise INO to discover novel approaches and create cutting-edge products while closely adhering to environmental standards. Additionally, businesses must guarantee that the packaging of every product is recyclable, repairable, and reusable to safeguard the environment. These encouraging findings are in line with those of other studies (Chen et al., 2018; Pouresmaeili et al., 2018), showing that companies need to constantly innovate by looking for new ways to do things in order to remain competitive in the global market. However, there are still conflicting views and different opinions on the role of EC and INO factors in promoting SP from previous studies (Aftab et al., 2022; Mokbel Al Koliby et al., 2024). This study identifies that INO is the missing link between the firm's EC and SP; hence, the relationship between them is uncertain. This study also contributes to the contingency perspective by explaining how INO acts as a boundary condition in strengthening the relationship between EC and SP performance in an emerging economy.

Furthermore, these findings are consistent with Chabbouh and Boujelbene (2023), who found that EC significantly influence INO and SP. However, our study extends their work by quantifying the mediating effect of INO more explicitly. This result aligns with Amini Sedeh et al. (2022), who emphasised EC's importance in overcoming INO barriers in emerging markets. Unlike Aftab et al. (2022), who found environmental dynamism to moderate EC's impact, our findings suggest that DC plays a more direct moderating role in linking CS and SP. Moreover, in line with Umar et al. (2018), this study confirms that INO mediates the relationship between EC and SP. Collectively, these comparisons reinforce our study's contribution to the literature by highlighting context-specific effects in Vietnam and enriching the contingency perspective.

Second, this study extends the dynamic capabilities and open INO perspectives to explain and examine the direct, moderating effects of DC, CS, and INO on firms' SP. The study constructed scales and assessed their impact by developing bidirectional open INO constructs that can be leveraged based on DC. The findings complement the existing INO literature by demonstrating a positive relationship between DC, INO, and SP. The research's findings are consistent with those of recent studies (Bereznoy et al., 2021; Wu et al., 2022) that indicate DC directly improves SP. DC's utilisation is anticipated to integrate internal capabilities with business models by capturing opportunities and knowledge from external sources since it is now regarded as one of the essential resource capabilities of external companies to accomplish SP (Jiao et al., 2022; Mubarak & Petraite, 2020). Likewise, Albats et al. (2023) linked digital technology to the exploration of DC, which eventually resulted in INO. Furthermore, these findings attest to the fact that DC is a fundamental platform for raising awareness and information, which fosters INO activity (Arias-Pérez et al., 2021). This reaffirms the significance of DC in developing economies and bolsters the body of research that highlights DC's ability to raise INO (Urbinati et al., 2020). Moreover, DC assists businesses in maximising the use of their current resources and improving the effectiveness of material and energy usage to support SP (Li, 2022). However, many emerging market firms are finding competitive advantage in traditional assets and functions rather than DC, making it more challenging to achieve SP growth amid intensifying global competition (Baudier et al., 2023) and putting pressure on firms to abandon old ways of thinking and embrace disruptive change (Krammer, 2022). Therefore, if emerging market firms want to respond to the DC process and create a long-term competitive advantage, they must increasingly secure and improve their DC (Liu et al., 2023; Nazarenko et al., 2022; Park et al., 2022). This work integrates dynamic capabilities and INO viewpoints, thoroughly examines the impacts of DC on many SP features, and adds to the body of current knowledge. These results are in line with other research (Baruch & Lin, 2012) and support the idea that companies should use CS to increase productivity and capacity. Furthermore, this study demonstrates that

CS significantly and favorably influences SP and INO. CS might affect INO and SP in a developing environment, given the challenges associated with attaining sustainable growth with a single organisation due to quick changes in the business and environmental landscape. In order to boost sustainability, organisations are exploring collaborations with external knowledge sources and adopting a more open approach to INO development in the increasingly competitive and linked business marketplaces (Bouncken & Kraus, 2013). As a result, CS is critical for contributing value to INO and attaining SP, as well as providing several chances for information exchange with both competitive and non-competitive partners (Munten et al., 2021). This work adds to the body of knowledge already in the literature by shedding light on the regulatory function of DC in the interaction between CS and SP.

Finally, the study's conclusions have helped management practices achieve a sustained competitive edge by utilising DC to its full potential and enhancing EC, INO, CS, and SP as anticipated. Managers ought to focus more on the relationship between EC, CS's acquisition of outside expertise, and technology to improve DC numbers and maximise INO for more enduring success. Moreover, managers across all organisational levels need to understand that DC utilisation may support both CS and INO. The most important thing is for companies to realise how critical it is to successfully implement INO in rising markets like Vietnam, which are prone to numerous internal and external changes. Therefore, by using CS to establish interaction effects amongst INO, managers at all levels may realise synergy. They should also understand that working with rivals to create new technologies and expertise may help organisations innovate and broaden their competency base, which can lead to long-term performance improvements. In other words, because INO activities yield better results for the business, managers at all levels may encourage them more methodically. Therefore, managers can profit from developing and fostering tight partnerships with external CS-based firms in growing markets in a highly competitive landscape in order to absorb external expertise and resources.

## THEORETICAL IMPLICATIONS

The research operationalises and expands RBV theory by integrating EC, CS, and DC as strategic intangible resources that collectively influence SP. While RBV has traditionally focused on internal resources, this study incorporates digital and collaborative capacities, showcasing how internal (EC) and external (CS) resources dynamically interact to enhance firm performance. Besides cross-theory synthesis, the paper bridges RBV, NRBV, and dynamic capabilities theory, providing a comprehensive framework that captures the complexity of achieving sustainability

in dynamic, resource-constrained environments. This synthesis enhances the theoretical toolkit available for analysing sustainability strategies in less-studied emerging markets.

## PRACTICAL IMPLICATIONS

The findings of this study offer several important takeaways for business leaders, entrepreneurs, and policymakers striving to enhance SP in emerging market contexts. To develop and strengthen EC, business leaders should prioritise the development of key EC, including opportunity recognition, organisational capacity, and long-term commitment. Leverage INO as a strategic enabler; INO functions as a critical bridge between EC and SP. By adopting coopetition strategies for resource synergy, companies, particularly SMEs, can achieve competitive and sustainable advantages by cooperating with competitors to share knowledge, reduce risk, and access complementary resources. In today's digital-first environment, firms must actively invest in digital transformation. To integrate strategic planning with sustainability objectives, managers should align INO and digitalisation initiatives with long-term sustainability goals. To promote cross-functional and external collaboration to drive holistic INO, firms should establish cross-functional teams internally and build partnerships externally. Strategically combine coopetition and digital transformation; the synergistic use of coopetition and DC is especially effective in enhancing SP.

## CONCLUSIONS

This study offers significant contributions to the theory and practice of strategic management, particularly within the contexts of emerging economies and digital transformation. Building on the RBV, the findings confirm that EC and CS are critical drivers of SP. Furthermore, INO functions as a partial mediator, while DC plays both a direct and moderating role, enhancing the effectiveness of CS on SP. From a theoretical standpoint, this research adds to the evolving literature by synthesising RBV, dynamic capabilities, and open INO theories into one comprehensive framework. It highlights how EC and CS, when properly integrated with INO and digital capacity, contribute significantly to SP in volatile and resource-constrained environments such as Vietnam. These findings extend the applicability of RBV in digital contexts and emerging markets, offering new avenues for theoretical exploration. Practically, the results provide actionable insights for managers and policymakers. Firms should focus on fostering internal EC and facilitating cooperative relationships with competitors to access shared resources and market intelligence. Moreover, the positive role of DC suggests that digital investments are no longer optional but necessary to drive sustainable

and innovation-driven growth. Building strong INO mechanisms, especially those that integrate digital tools and cross-functional collaboration, will ensure long-term competitiveness. This research also opens several pathways for future study. First, the findings are based on cross-sectional data, and future longitudinal studies could validate causal relationships. Second, cultural factors and institutional differences across developing nations may moderate the relationships identified here, suggesting the need for comparative cross-country studies. Third, mixed-method approaches incorporating qualitative case studies can help uncover deeper insights into how EC, CS, DC, and INO interact across industries.

In summary, this study offers a robust, evidence-based framework that links entrepreneurial behaviour, cooperation, digital transformation, and sustainable outcomes. It enriches both scholarly understanding and managerial practice, particularly in the strategic management of sustainability in emerging market environments. Future research should continue to explore the contextual dynamics that shape these relationships to foster more inclusive and effective strategies for sustainable development.

## Limitations and Future Research Directions

First, while the study utilised a sample of companies from Ho Chi Minh City, the largest city in Vietnam, a developing country, examining nations with comparable rising economies is vital to enhance the broader generalisability of the findings. Additionally, the cross-sectional data employed in this study restricted the capacity to deduce cause-and-effect relationships. The reliance on convenience sampling yielded a sample of just 357 business owners and managers, which may compromise the generalisability and representativeness of the findings. The convenience sampling method resulted in only 357 business owners and managers participating, which may limit the representativeness of the sample. Furthermore, because the study focuses on a single developing country context, Vietnam, the findings may differ from those in less developed or more developed countries. Therefore, future research should expand the scope to include both developing and developed countries to provide a more comprehensive understanding. Second, while the majority of the methods used in this study are quantitative, other techniques may be used in future research to evaluate similarities and differences. Furthermore, to assess whether or not response bias occurred among respondents, future studies examining the inclusion of other populations, such as self-identity, in the research model should consider measuring social desirability bias using the Marlowe–Crowne Brief Social Desirability Scale C (Anderson, 2004). In the context of globalisation, other components that make up an enterprise's SP are also suggested.

## ACKNOWLEDGEMENTS

This research was funded by the Ho Chi Minh City University of Industry and Trade, Vietnam.

## REFERENCES

Abdul-Rashid, S. H., Sakundarini, N., Ghazilla, R. A. R., & Thurasamy, R. (2017). The impact of sustainable manufacturing practices on sustainability performance: Empirical evidence from Malaysia. *International Journal of Operations & Production Management, 37*(2), 182–204. https://doi.org/10.1108/IJOPM-04-2015-0223

Abubakar, A. (2024). Competition and cooperation: A coopetition strategy for sustainable performance through serial mediation of knowledge sharing and open innovation. *Global Knowledge, Memory and Communication*, [Ahead of print]. https://doi.org/10.1108/GKMC-10-2023-0398

Aftab, J., Veneziani, M., Sarwar, H., & Ishaq, M. I. (2022). Entrepreneurial orientation and firm performance in SMEs: The mediating role of entrepreneurial competencies and moderating role of environmental dynamism. *International Journal of Emerging Markets, 9*(10), 3329–3352. https://doi.org/10.1108/IJOEM-07-2021-1151

Afum, E., Osei-Ahenkan, V. Y., Agyabeng-Mensah, Y., Owusu, J. A., Kusi, L. Y., & Ankomah, J. (2020). Green manufacturing practices and sustainable performance among Ghanaian manufacturing SMEs: The explanatory link of green supply chain integration. *Management of Environmental Quality: An International Journal, 31*(6), 1457–1475. https://doi.org/10.1108/MEQ-01-2020-0019

Agyapong, F. O., Agyapong, A., & Poku, K. (2017). Nexus between social capital and performance of micro and small firms in an emerging economy: The mediating role of innovation. *Cogent Business & Management, 4*(1), 1309784. https://doi.org/10.1080/23311975.2017.1309784

Al Mamun, A., Nawi, N. B. C., & Zainol, N. R. B. (2016). Entrepreneurial competencies and performance of informal micro-enterprises in Malaysia. *Mediterranean Journal of Social Sciences, 7*(3), 273. https://doi.org/10.5901/mjss.2016.v7n3p273

Albats, E., Podmetina, D., & Vanhaverbeke, W. (2023). Open innovation in SMEs: A process view towards business model innovation. *Journal of Small Business Management, 61*(6), 2519–2560. https://doi.org/10.1080/00472778.2021.1913595

Allal-Chérif, O., Climent, J. C., & Berenguer, K. J. U. (2023). Born to be sustainable: How to combine strategic disruption, open innovation, and process digitization to create a sustainable business. *Journal of Business Research, 154*, 113379. https://doi.org/10.1016/j.jbusres.2022.113379

Amini Sedeh, A., Pezeshkan, A., & Caiazza, R. (2022). Innovative entrepreneurship in emerging and developing economies: The effects of entrepreneurial competencies and institutional voids. *The Journal of Technology Transfer, 47*, 1198–1223. https://doi.org/10.1007/s10961-021-09874-1

Anderson, J. C. (2004). *Business market management: Understanding, creating, and delivering value*. Pearson Education India.

Annarelli, A., Battistella, C., Nonino, F., Parida, V., & Pessot, E. (2021). Literature review on digitalization capabilities: Co-citation analysis of antecedents, conceptualization and consequences. *Technological Forecasting and Social Change, 166*, 120635. https://doi.org/10.1016/j.techfore.2021.120635

Arias-Pérez, J., Velez-Ocampo, J., & Cepeda-Cardona, J. (2021). Strategic orientation toward digitalization to improve innovation capability: Why knowledge acquisition and exploitation through external embeddedness matter. *Journal of Knowledge Management, 25*(5), 1319–1335. https://doi.org/10.1108/JKM-03-2020-0231

Bacon, E., Williams, M. D., & Davies, G. (2020). Coopetition in innovation ecosystems: A comparative analysis of knowledge transfer configurations. *Journal of Business Research, 115*, 307–316. https://doi.org/10.1016/j.jbusres.2019.11.005

Bamfo, B. A., & Kraa, J. J. (2019). Market orientation and performance of small and medium enterprises in Ghana: The mediating role of innovation. *Cogent Business & Management, 6*(1), 1605703. https://doi.org/10.1080/23311975.2019.1605703

Barney, J. (1991a). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Barney, J. (1991b). Special theory forum the resource-based model of the firm: Origins, implications, and prospects. *Journal of Management, 17*(1), 97–98. https://doi.org/10.1177/014920639101700107

Baruch, Y., & Lin, C.-P. (2012). All for one, one for all: Coopetition and virtual team performance. *Technological Forecasting and Social Change, 79*(6), 1155–1168. https://doi.org/10.1016/j.techfore.2012.01.008

Baudier, P., Kondrateva, G., Ammi, C., Chang, V., & Schiavone, F. (2023). Digital transformation of healthcare during the COVID-19 pandemic: Patients' teleconsultation acceptance and trusting beliefs. *Technovation, 120*, 102547. https://doi.org/10.1016/j.technovation.2022.102547

Bengtsson, M., & Kock, S. (2000). "Coopetition" in business Networks—to cooperate and compete simultaneously. *Industrial Marketing Management, 29*(5), 411–426. https://doi.org/10.1016/S0019-8501(99)00067-X

Bereznoy, A., Meissner, D., & Scuotto, V. (2021). The intertwining of knowledge sharing and creation in the digital platform based ecosystem. A conceptual study on the lens of the open innovation approach. *Journal of Knowledge Management, 25*(8), 2022–2042. https://doi.org/10.1108/JKM-10-2020-0769

Bertello, A., De Bernardi, P., Santoro, G., & Quaglia, R. (2022). Unveiling the microfoundations of multiplex boundary work for collaborative innovation. *Journal of Business Research, 139*, 1424–1434. https://doi.org/10.1016/j.jbusres.2021.10.039

Blackburn, M., Alexander, J., Legan, J. D., & Klabjan, D. (2017). Big Data and the future of R&D management: The rise of big data and big data analytics will have significant implications for R&D and innovation management in the next decade. *Research-Technology Management, 60*(5), 43–51. https://doi.org/10.1080/08956308.2017.1348135

Bouncken, R. B., & Fredrich, V. (2012). Coopetition: Performance implications and management antecedents. *International Journal of Innovation Management, 16*(05), 1250028. https://doi.org/10.1142/S1363919612500284

Bouncken, R. B., Fredrich, V., Ritala, P., & Kraus, S. (2018). Coopetition in new product development alliances: Advantages and tensions for incremental and radical innovation. *British Journal of Management, 29*(3), 391–410. https://doi.org/10.1111/1467-8551.12213

Bouncken, R. B., & Kraus, S. (2013). Innovation in knowledge-intensive industries: The double-edged sword of coopetition. *Journal of Business Research, 66*(10), 2060–2070. https://doi.org/10.1111/1467-8551.12213

Chabbouh, H., & Boujelbene, Y. (2023). Open innovation, dynamic organizational capacities and innovation performance in SMEs: Empirical evidence in the Tunisian manufacturing industry. *The International Journal of Entrepreneurship and Innovation, 24*(3), 178–190. https://doi.org/10.1177/14657503211066014

Chatterjee, S., Chaudhuri, R., Shah, M., & Maheshwari, P. (2022). Big data driven innovation for sustaining SME supply chain operation in post COVID-19 scenario: Moderating role of SME technology leadership. *Computers & Industrial Engineering, 168,* 108058. https://doi.org/10.1016/j.cie.2022.108058

Chen, J., Yin, X., & Mei, L. (2018). Holistic innovation: An emerging innovation paradigm. *International Journal of Innovation Studies, 2*(1), 1–13. https://doi.org/10.1016/j.ijis.2018.02.001

Chiarini, A. (2021). Industry 4.0 technologies in the manufacturing sector: Are we sure they are all relevant for environmental performance? *Business Strategy and the Environment, 30*(7), 3194–3207. https://doi.org/10.1002/bse.2797

Christ, K. L., Burritt, R. L., & Varsei, M. (2017). Coopetition as a potential strategy for corporate sustainability. *Business Strategy and the Environment, 26*(7), 1029–1040. https://doi.org/10.1002/bse.1967

Corbo, L., Kraus, S., Vlačić, B., Dabić, M., Caputo, A., & Pellegrini, M. M. (2023). Coopetition and innovation: A review and research agenda. *Technovation, 122,* 102624. https://doi.org/10.1016/j.technovation.2022.102624

Cozzolino, A., Corbo, L., & Aversa, P. (2021). Digital platform-based ecosystems: The evolution of collaboration and competition between incumbent producers and entrant platforms. *Journal of Business Research, 126,* 385–400. https://doi.org/10.1016/j.jbusres.2020.12.058

Crick, J. M., Friske, W., & Morgan, T. A. (2024). The relationship between coopetition strategies and company performance under different levels of competitive intensity, market dynamism, and technological turbulence. *Industrial Marketing Management, 118,* 56–77. https://doi.org/10.1016/j.indmarman.2024.02.005

Czakon, W., Klimas, P., & Mariani, M. (2020). Behavioral antecedents of coopetition: A synthesis and measurement scale. *Long Range Planning, 53*(1), 101875. https://doi.org/10.1016/j.lrp.2019.03.001

Du, S., Bstieler, L., & Yalcinkaya, G. (2022). Sustainability-focused innovation in the business-to-business context: Antecedents and managerial implications. *Journal of Business Research, 138,* 117–129. https://doi.org/10.1016/j.jbusres.2021.09.006

Eltayeb, T. K., Zailani, S., & Ramayah, T. (2011). Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes. *Resources, Conservation and Recycling, 55*(5), 495–506. https://doi.org/10.1016/j.resconrec.2010.09.003

Esposito De Falco, S., Renzi, A., Orlando, B., & Cucari, N. (2017). Open collaborative innovation and digital platforms. *Production Planning & Control, 28*(16), 1344–1353. https://doi.org/10.1080/09537287.2017.1375143

Foss, N. J., & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go? *Journal of Management, 43*(1), 200–227. https://doi.org/10.1177/01492063166759

Gawer, A. (2022). Digital platforms and ecosystems: Remarks on the dominant organizational forms of the digital age. *Innovation, 24*(1), 110–124. https://doi.org/10.1080/14479338.2021.1965888

Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review, 20*(4), 986–1014. https://doi.org/10.5465/amr.1995.9512280033

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115–135. https://doi.org/10.1007/s11747-014-0403-8

Imran, M., Salisu, I., Aslam, H. D., Iqbal, J., & Hameed, I. (2019). Resource and information access for SME sustainability in the era of IR 4.0: The mediating and moderating roles of innovation capability and management commitment. *Processes, 7*(4), 211. https://doi.org/10.3390/pr7040211

Ismail, I. J. (2022). Entrepreneurial start-up motivations and growth of small and medium enterprises in Tanzania: The role of entrepreneur's personality traits. *FIIB Business Review, 11*(1), 79–93. https://doi.org/10.1177/23197145211068599

Jeong, S. W., & Chung, J.-E. (2023). Enhancing competitive advantage and financial performance of consumer-goods SMEs in export markets: How do social capital and marketing innovation matter? *Asia Pacific Journal of Marketing and Logistics, 35*(1), 74–89. https://doi.org/10.1108/APJML-05-2021-0301

Jiao, H., Yang, J., & Cui, Y. (2022). Institutional pressure and open innovation: The moderating effect of digital knowledge and experience-based knowledge. *Journal of Knowledge Management, 26*(10), 2499–2527. https://doi.org/10.1108/JKM-01-2021-0046

Kazancoglu, Y., Sezer, M. D., Ozkan-Ozen, Y. D., Mangla, S. K., & Kumar, A. (2021). Industry 4.0 impacts on responsible environmental and societal management in the family business. *Technological Forecasting and Social Change, 173*, 121108. https://doi.org/10.1016/j.techfore.2021.121108

Kedia, B. L., Rhew, N. D., Gaffney, N. T., & Clampit, J. A. (2016). Emerging market multinationals: Coopetition for global growth. *Thunderbird International Business Review, 58*(6), 515–526. https://doi.org/10.1002/tie.21758

Kennedy, S., Whiteman, G., & van den Ende, J. (2017). Radical innovation for sustainability: The power of strategy and open innovation. *Long Range Planning, 50*(6), 712–725. https://doi.org/10.1016/j.lrp.2016.05.004

Koomson, S. (2025). Sustainable strategic management: How speed and flexibility drive performance through innovation. *Business Process Management Journal*. https://doi.org/10.1108/BPMJ-01-2025-0130

Kotsopoulos, D., Karagianaki, A., & Baloutsos, S. (2022). The effect of human capital, innovation capacity, and Covid-19 crisis on knowledge-intensive enterprises' growth within a VC-driven innovation ecosystem. *Journal of Business Research, 139*, 1177–1191. https://doi.org/10.1016/j.jbusres.2021.10.055

Krammer, S. M. (2022). Navigating the new normal: Which firms have adapted better to the COVID-19 disruption? *Technovation, 110,* 102368. https://doi.org/10.1016/j.technovation.2021.102368

Laosirihongthong, T., Adebanjo, D., & Choon Tan, K. (2013). Green supply chain management practices and performance. *Industrial Management & Data Systems, 113*(8), 1088–1109. https://doi.org/10.1108/IMDS-04-2013-0164

Le, T. H., & Mai, N. K. (2025). The influence of prospector and defender strategies on dynamic capabilities, innovation, and financial effectiveness in Vietnamese service SMEs. *Entrepreneurial Business and Economics Review, 13*(1), 187–205. https://doi.org/10.15678/EBER.2025.130111

Lee, M.-J., & Roh, T. (2023). Digitalization capability and sustainable performance in emerging markets: Mediating roles of in/out-bound open innovation and coopetition strategy. *Management Decision* [Ahead of print]. https://doi.org/10.1108/MD-10-2022-1398

Lee, V.-H., Hew, J.-J., Leong, L.-Y., Tan, G. W.-H., & Ooi, K.-B. (2020). Wearable payment: A deep learning-based dual-stage SEM-ANN analysis. *Expert Systems with Applications, 157,* 113477. https://doi.org/10.1016/j.eswa.2020.113477

Leong, L.-Y., Hew, T.-S., Ooi, K.-B., & Wei, J. (2020). Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. *International Journal of Information Management, 51,* 102047. https://doi.org/10.1016/j.ijinfomgt.2019.102047

Leong, L.-Y., Jaafar, N. I., & Ainin, S. (2018). The effects of Facebook browsing and usage intensity on impulse purchase in f-commerce. *Computers in Human Behavior, 78,* 160–173. https://doi.org/10.1016/j.chb.2017.09.033

Lew, Y. K., & Sinkovics, R. R. (2013). Crossing borders and industry sectors: Behavioral governance in strategic alliances and product innovation for competitive advantage. *Long Range Planning, 46*(1–2), 13–38. https://doi.org/10.1016/j.lrp.2012.09.006

Li, F. (2020). The digital transformation of business models in the creative industries: A holistic framework and emerging trends. *Technovation, 92,* 102012. https://doi.org/10.1016/j.technovation.2017.12.004

Li, L. (2022). Digital transformation and sustainable performance: The moderating role of market turbulence. *Industrial Marketing Management, 104,* 28–37. https://doi.org/10.1016/j.indmarman.2022.04.007

Lingappa, A. K., LR, L. R., & Shetty, D. K. (2023). Women entrepreneurial motivation and business performance: The role of learning motivation and female entrepreneurial competencies. *Industrial and Commercial Training, 55*(2), 269–283. https://doi.org/10.1108/ICT-06-2022-0042

Liu, Y., Dong, J., Mei, L., & Shen, R. (2023). Digital innovation and performance of manufacturing firms: An affordance perspective. *Technovation, 119,* 102458. https://doi.org/10.1016/j.technovation.2022.102458

Lopez-Becerra, E. I., & Alcon, F. (2021). Social desirability bias in the environmental economic valuation: An inferred valuation approach. *Ecological Economics, 184,* 106988. https://doi.org/10.1016/j.ecolecon.2021.106988

Lv, J., Zou, X., Yang, Q., & Zhang, K. (2025). Analyzing the influence of coopetition on resilience in the open innovation network from the perspective of knowledge diffusion. *International Journal of Managing Projects in Business, 18*(1), 165–188. https://doi.org/10.1108/IJMPB-05-2024-0118

Mantena, R., & Saha, R. L. (2012). Coopetition between differentiated platforms in two-sided markets. *Journal of Management Information Systems, 29*(2), 109–140. https://doi.org/10.2753/MIS0742-1222290205

Manzhynski, S., Biedenbach, G., Raza-Ullah, T., & Źróbek-Różańska, A. (2025). Coopetition and sustainability performance: Examining the impact of cognitive and behavioral mechanisms. *Journal of Business & Industrial Marketing, 40*(13), 124–141. https://doi.org/10.1108/JBIM-02-2024-0103

Masucci, M., Brusoni, S., & Cennamo, C. (2020). Removing bottlenecks in business ecosystems: The strategic role of outbound open innovation. *Research Policy, 49*(1), 103823. https://doi.org/10.1016/j.respol.2019.103823

Michalisin, M., & Stinchfield, B. (2010). Climate change strategies and firm performance: An empirical investigation of the natural resource-based view of the firm. *Journal of Business Strategies, 27*(2), 123–149. https://doi.org/10.54155/jbs.27.2.123-149

Mikalef, P., Pappas, I. O., Krogstie, J., & Giannakos, M. (2018). Big data analytics capabilities: A systematic literature review and research agenda. *Information Systems and e-Business Management, 16*, 547–578. https://doi.org/10.1007/s10257-017-0362-y

Mohammadkazemi, R., Rasekh, N., & Navid, M. (2016). The effect of entrepreneurial competencies on innovation: A case study of professional sport clubs. *International Business Research, 9*(11), 57–64. https://doi.org/10.5539/ibr.v9n11p57

Mokbel Al Koliby, I. S., Abdullah, H. H., & Mohd Suki, N. (2024). Linking entrepreneurial competencies, innovation and sustainable performance of manufacturing SMEs. *Asia-Pacific Journal of Business Administration, 16*(1), 21–40. https://doi.org/10.1108/APJBA-09-2021-0480

Mubarak, M. F., & Petraite, M. (2020). Industry 4.0 technologies, digital trust and technological orientation: What matters in open innovation? *Technological Forecasting and Social Change, 161*, 120332. https://doi.org/10.1016/j.techfore.2020.120332

Munten, P., Vanhamme, J., Maon, F., Swaen, V., & Lindgreen, A. (2021). Addressing tensions in coopetition for sustainable innovation: Insights from the automotive industry. *Journal of Business Research, 136*, 10–20. https://doi.org/10.1016/j.jbusres.2021.07.020

Nasiri, M., Ukko, J., Saunila, M., & Rantala, T. (2020). Managing the digital supply chain: The role of smart technologies. *Technovation, 96*, 102121. https://doi.org/10.1016/j.technovation.2020.102121

Nayal, K., Kumar, S., Raut, R. D., Queiroz, M. M., Priyadarshinee, P., & Narkhede, B. E. (2022). Supply chain firm performance in circular economy and digital era to achieve sustainable development goals. *Business Strategy and the Environment, 31*(3), 1058–1073. https://doi.org/10.1002/bse.2935

Nazarenko, A., Vishnevskiy, K., Meissner, D., & Daim, T. (2022). Applying digital technologies in technology roadmapping to overcome individual biased assessments. *Technovation, 110*, 102364. https://doi.org/10.1016/j.technovation.2021.102364

Novojen, O., & Birnaz, N. (2019). Ecosystem of learning in initial vocational education and training: An innovative model for development of entrepreneurial competence. In E. A. Railean (Ed.), *Handbook of research on ecosystem-based theoretical models of learning and communication* (pp. 194–210). IGI Global. https://doi.org/10.4018/978-1-5225-7853-6.ch012

Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment & Evaluation in Higher Education, 33*(3), 301–314. https://doi.org/10.1080/02602930701293231

Nuruzzaman, N., Singh, D., & Gaur, A. S. (2020). Institutional support, hazards, and internationalization of emerging market firms. *Global Strategy Journal, 10*(2), 361–385. https://doi.org/10.1002/gsj.1365

Nylén, D., & Holmström, J. (2019). Digital innovation in context: Exploring serendipitous and unbounded digital innovation at the church of Sweden. *Information Technology & People, 32*(3), 696–714. https://doi.org/10.1108/ITP-05-2017-0148

Okolie, U. C., Igwe, P. A., Ayoola, A. A., Nwosu, H. E., Kanu, C., & Mong, I. K. (2021). Entrepreneurial competencies of undergraduate students: The case of universities in Nigeria. *The International Journal of Management Education, 19*(1), 100452. https://doi.org/10.1016/j.ijme.2021.100452

Oparaocha, G. O. (2015). SMEs and international entrepreneurship: An institutional network perspective. *International Business Review, 24*(5), 861–873. https://doi.org/10.1016/j.ibusrev.2015.03.007

Parida, V., Burström, T., Visnjic, I., & Wincent, J. (2019). Orchestrating industrial ecosystem in circular economy: A two-stage transformation model for large manufacturing companies. *Journal of Business Research, 101,* 715–725. https://doi.org/10.1016/j.jbusres.2019.01.006

Park, B.-J. R., Srivastava, M. K., & Gnyawali, D. R. (2014). Walking the tight rope of coopetition: Impact of competition and cooperation intensities and balance on firm innovation performance. *Industrial Marketing Management, 43*(2), 210–221. https://doi.org/10.1016/j.indmarman.2013.11.003

Park, S., Rosca, E., & Agarwal, N. (2022). Driving social impact at the bottom of the pyramid through the internet-of-things enabled frugal innovations. *Technovation, 118,* 102381. https://doi.org/10.1016/j.technovation.2021.102381

Paul, T., Mondal, S., Islam, N., & Rakshit, S. (2021). The impact of blockchain technology on the tea supply chain and its sustainable performance. *Technological Forecasting and Social Change, 173,* 121163. https://doi.org/10.1016/j.techfore.2021.121163

Paulraj, A. (2011). Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. *Journal of Supply Chain Management, 47*(1), 19–37. https://doi.org/10.1111/j.1745-493X.2010.03212.x

Pouresmaeili, H., Imm, N. S., Sambasivan, M., & Yusof, R. N. R. (2018). Degree of internationalization and performance: Mediating role of innovation and moderating role of knowledge management system. *International Journal of Economics & Management, 12*(1).

Qi, S.-Z., Peng, H.-R., & Zhang, Y.-J. (2019). Energy intensity convergence in Belt and Road Initiative (BRI) countries: What role does China-BRI trade play? *Journal of Cleaner Production, 239*, 118022. https://doi.org/10.1016/j.jclepro.2019.118022

Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? *International Journal of Operations & Production Management, 25*(9), 898–916. https://doi.org/10.1108/01443570510613956

Rashid, N., Jabar, J., Yahya, S., & Samer, S. (2015). State of the art of sustainable development: An empirical evidence from firm's resource and capabilities of Malaysian automotive industry. *Procedia-Social and Behavioral Sciences, 195*, 463–472. https://doi.org/10.1016/j.sbspro.2015.06.488

Raut, R. D., Mangla, S. K., Narwane, V. S., Gardas, B. B., Priyadarshinee, P., & Narkhede, B. E. (2019). Linking big data analytics and operational sustainability practices for sustainable business management. *Journal of Cleaner Production, 224*, 10–24. https://doi.org/10.1016/j.jclepro.2019.03.181

Riquelme-Medina, M., Stevenson, M., Barrales-Molina, V., & Llorens-Montes, F. J. (2022). Coopetition in business ecosystems: The key role of absorptive capacity and supply chain agility. *Journal of Business Research, 146*, 464–476. https://doi.org/10.1016/j.jbusres.2022.03.071

Roh, T., Lee, K., & Yang, J. Y. (2021). How do intellectual property rights and government support drive a firm's green innovation? The mediating role of open innovation. *Journal of Cleaner Production, 317*, 128422. https://doi.org/10.1016/j.jclepro.2021.128422

Roh, T., Noh, J., Oh, Y., & Park, K.-S. (2022). Structural relationships of a firm's green strategies for environmental performance: The roles of green supply chain management and green marketing innovation. *Journal of Cleaner Production, 356*, 131877. https://doi.org/10.1016/j.jclepro.2022.131877

Rouyre, A., & Fernandez, A.-S. (2019). Managing knowledge sharing-protecting tensions in coupled innovation projects among several competitors. *California Management Review, 62*(1), 95–120. https://doi.org/10.1177/0008125619885151

Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. *Journal of Knowledge Management, 24*(9), 2079–2106. https://doi.org/10.1108/JKM-11-2019-0624

Shamsuddin, J. (2014). Malaysian SME performance and the government business support services: The moderating effects of absorptive capacity [Unpublished PhD. Dissertation]. Universiti Utara Malaysia.

Silvius, G. (2017). Sustainability as a new school of thought in project management. *Journal of Cleaner Production, 166*, 1479–1493. https://doi.org/10.1016/j.jclepro.2017.08.121

Singh, D. A. (2009). Export performance of emerging market firms. *International Business Review, 18*(4), 321–330. https://doi.org/10.1016/j.ibusrev.2009.03.002

Tehseen, S., Ahmed, F. U., Qureshi, Z. H., Uddin, M. J., & Ramayah, T. (2019). Entrepreneurial competencies and SMEs' growth: The mediating role of network competence. *Asia-Pacific Journal of Business Administration, 11*(1), 2–29. https://doi.org/10.1108/APJBA-05-2018-0084

Umar, A., Omar, C., Hamzah, M. S. G., & Hashim, A. (2018). The mediating effect of innovation on entrepreneurial competencies and business success in Malaysian SMEs. *International Business Research, 11*(8), 142–153. https://doi.org/10.5539/ibr.v11n8p142

Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *Journal of Information Technology Theory and Application, 11*(2), 2.

Urbinati, A., Chiaroni, D., Chiesa, V., & Frattini, F. (2020). The role of digital technologies in open innovation processes: an exploratory multiple case study analysis. *R&D Management, 50*(1), 136–160. https://doi.org/10.1111/radm.12313

Varadarajan, R. (2017). Innovating for sustainability: A framework for sustainable innovations and a model of sustainable innovations orientation. *Journal of the Academy of Marketing Science, 45*, 14–36. https://doi.org/10.1007/s11747-015-0461-6

Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning, 52*(3), 326–349. https://doi.org/10.1016/j.lrp.2018.12.001

Wu, L., Sun, L., Chang, Q., Zhang, D., & Qi, P. (2022). How do digitalization capabilities enable open innovation in manufacturing enterprises? A multiple case study based on resource integration perspective. *Technological Forecasting and Social Change, 184*, 122019. https://doi.org/10.1016/j.techfore.2022.122019

Yan, D. (2022). Construction of innovative talent ecosystem under the background of enterprise digital transformation. In J. C. Hung, J. W. Chang, Y. Pei, & W. C. Wu (Eds.), *Innovative Computing Proceedings of the 4th International Conference on Innovative Computing (IC 2021)*, (vol. 791, pp. 803–809). Springer. https://doi.org/10.1007/978-981-16-4258-6_98

Yustian, O., Suryana, S., Furqon, C., & Hendrayati, H. (2021). The mediating role of competitiveness between entrepreneurial competence and business success. *Management Science Letters, 11*(1), 93–100. https://doi.org/10.5267/j.msl.2020.8.026

Zafar, A., & Mustafa, S. (2017). SMEs and its role in economic and socio-economic development of Pakistan. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 6*(4), 195–205. https://doi.org/10.6007/IJARAFMS/v7-i4/3484