ISSN 2669-2481 / eISSN 2669-249X

VILNIUS TECH
Vilnius Gediminas Technical University

BUSINESS, MANAGEMENT AND ECONOMICS ENGINEERING

2023
Volume 21
Issue 1
Pages 1–18

https://doi.org/10.3846/bmee.2023.17740

INVIGORATING SUPPLY CHAIN PERFORMANCE IN SMALL MEDIUM ENTERPRISES: EXPLORING KNOWLEDGE SHARING AS MODERATOR

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Article History:
- received 05 October 2022
- accepted 02 January 2023

Abstract. *Purpose* – This research aimed to evaluate information sharing as a moderating component and examine supply chain performance, including collaboration, capabilities, and innovation. Particularly in the SME sector, since the significance of collaboration and opportunity in supply chains as an SCM trigger is still underdeveloped.

Research methodology – To test the hypotheses, data were collected from 179 SMEs in Indonesia, involving 537 managers and assistant managers, and analyzed using partial least square modeling.

Findings – The result of cooperation with supply chain partners has led to the gradual improvement of capabilities and innovations, such as improved processes, more efficient operations, better quality, and lower costs. It has also resulted in radical innovation, including introducing new technologies and a change in strategy; thus, it could develop and improve the ability to innovate. Finally, the results helped managers with strategic planning and prioritizing supply chain collaboration to improve capabilities, innovation, and performance.

Research limitations – generalizability is limited because of sampling constraints.

Practical implications – the results helped managers design strategic planning and prioritize supply chain collaboration to improve capabilities, innovation, and performance.

Originality/Value – to the extent of our knowledge, this study is the pioneer investigation into the supply chain in SMEs value-chains in an emerging country from a holistic perspective.

Keywords: supply chain performance, innovation performance, knowledge sharing, SMEs.

JEL Classification: 03, 031, P17.

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Introduction

The current economic climate shows that competition is now between supply chains rather than between enterprises to eliminate various interruptions (Kazmi & Ahmed, 2021) and cost-effectiveness (Hu et al., 2020; Jafari et al., 2021). In order to enhance operational performance, this serves as the foundation for strategic adjustments and an evaluation of the supply chain's collaborative structure (Baah et al., 2021b). Despite substantial research on supply chain management (Asamoah et al., 2020), more insight is required to identify the significance of supply chain capabilities as a trigger for SCM (Kazmi & Ahmed, 2021). Organizations must maximize their available resources to improve supply chain capabilities and

gain competitive advantages (S.-H. Liao et al., 2022). Building collaboration with suppliers, customers, and competitors can enhance this capability (Arsawan et al., 2022a). In order to increase supply chain performance and sustainability (Nandi et al., 2020), collaboration must be strengthened (Aslam et al., 2020). Despite the benefits, collaboration results in expensive transaction costs (Schmidt & Wagner, 2019). Therefore, building an ecosystem that supports the quality of the relationships between members is required.

The literature on supply networks emphasizes the importance of innovation performance, but it needs to get more attention (Ferraris et al., 2021). In order to comprehend innovation in the context of supply chains, further research is required (Gupta et al., 2020). Apart from various studies on supply chain capabilities that promote innovation performance, there has yet to be any empirical research linking cooperation and capabilities to boost innovation performance (Y. Liao & Li, 2019). Due to the requirement for empirical supply chain research, it is necessary to study how both are factors of innovation performance from an integrated perspective (Asree et al., 2018). According to the literature, supply chain performance is complicated and affected by a variety of variables, including collaboration (Liu et al., 2020b), capabilities (Asamoah et al., 2020), and innovation performance, which is the SCP's foundation (Kähkönen et al., 2017). In addition, the requirement for moderation must be considered because there is still a lack of understanding of the mechanisms underpinning the quality of interactions that influence innovation success (Rungsithong & Meyer, 2020).

Further, in this study, we use knowledge sharing as a moderator for three main reasons. First, sharing knowledge among supply chain members can generate ideas that will strengthen innovation (Fosso Wamba et al., 2020). In the supply chain context, knowledge is a crucial trigger that must be maintained and protected (Li, 2020). Second, knowledge sharing can increase the capacity of organizations to learn from one another to strengthen innovation (Arsawan et al., 2022b) because it involves social interaction, exchange of knowledge, experience, and research and development skills (Wang & Hu, 2020). Third, knowledge sharing is an intangible asset to achieve competitive advantage through collective knowledge management (Tukamuhabwa et al., 2021). Ultimately, interaction with knowledge sources, whether from suppliers, buyers, or other partners, is a way to acquire new knowledge, which will be strengthened by knowledge sharing to build supply chain performance (H. F. Lin, 2017). It will deepen the understanding of how to build sustainability through supply chain collaboration. This study intends to investigate the key characteristics, such as information sharing, which has yet to be previously evaluated, as supply chain performance predictors. Collaboration between firms relies heavily on knowledge exchange; therefore, innovation and supply chain performance will be more strongly affected in the future.

For the purpose of filling the gap, this study assessed drivers of supply chain performance in the SME context of Indonesia with several considerations. First, Indonesia is an archipelagic country consisting of 17,000 islands that require an integrated supply chain, especially involving 64.2 million MSMEs with a contribution to the Gross Domestic Product of 61.07 percent or IDR 8,573.89 trillion. Accordingly, comprising solid supply chain management will improve the performance of SMEs. Second, enhancing collaboration and supply chain capabilities is indispensable with the enormous potential of an archipelagic country that requires resources in an integrated manner. It can bridge SME operations across islands to reach the

right consumers. As a result, the inter-island economy will increase, the flow of goods will function adequately, and the needs of the people will be fulfilled. Third, SMEs need to build collaboration to improve capability and supply chain performance to build performance and competitive advantage. Despite limited resources and relatively low financial capabilities, the ability to build a convenient collaboration will improve operational performance capabilities and increase agility (Arsawan et al., 2022b). Lastly, citing the data from Schwab (2019) Indonesia has a low supply chain and innovation capabilities ranking. It is also shown to be ranked 74th; hence, collaboration with similar companies, suppliers, and competitors is crucial. Based on these concerns, it is reasonable to examine collaboration in enhancing innovation capabilities and performance on supply chain performance in the SME context. This research aims to evaluate information sharing as a moderating component and examine supply chain performance, including collaboration, capabilities, and innovation. Particularly in the SME sector, the importance of collaboration and opportunity in supply chains as an SCM trigger is still underdeveloped.

1. Literature review and hypotheses formulation

1.1. Stakeholder theory

The stakeholder idea is (Freeman, 1984) assertion that corporate organizations should consider all pertinent stakeholders' interests when making strategic decisions (Freeman et al., 2018). According to the thesis, there is a connection between business and communities, groups, and people who work for a similar objective and affect one another (Baah et al., 2021a). In order to produce value, innovate, and address inclusivity, as well as the interaction of pertinent groups and individuals, these interactions entail contacts, exchanges, and collaborations (Huge-Brodin et al., 2020). Because it necessitates interactions between businesses and various stakeholders, the supply chain is crucial to the idea. Although the idea served as a theoretical foundation for several SCM investigations, its advancement within SCM is still constrained (Y. C. Huang et al., 2021). Various industries worldwide, including the textile industry, hospitals, logistics companies, and industrial groups, have also studied and applied supply chain management (Liu et al., 2020a). However, companies are seen as organizations that need to define or comprehend their competitive strategy. Thus, they require constant improvement (Dey et al., 2021), about product development (Y. S. Lin & Chen, 2021), collaboration with supply chain members (Zaridis et al., 2021), and distribution capabilities for a competitive benefit (Tukamuhabwa et al., 2021).

1.2. Hypotheses development

Supply Chain Collaboration and Capabilities

Broad supply chain cooperation, according to S.-H. Liao et al. (2022) influence an organization's capacity to recognize, use, and incorporate internal or external resources and information to support overall activities. Collaboration is a technique to combine and test capabilities that affect organizational operations (Kleine Jäger & Piscicelli, 2021). Partners in the supply chain interact and work together to create a network that enhances the chain's capabilities,

effectiveness, and efficiency (Rajaguru & Matanda, 2019). Inter-organizational and inter-functional collaboration using coordinated and collaborative efforts enable superior performance through resource optimization to improve organizational capabilities, processes, and routines (Anser et al., 2020). Based on this description, the following hypothesis was formulated:
H1: Supply chain collaboration has a positive effect on capabilities

Supply Chain Collaboration and Performance

Organizational collaboration with suppliers helps to achieve the needed coordination in the supply chain by involving other organizations (Mandal & Saravanan, 2019). The motivation for collaboration is to improve overall performance (Liu et al., 2020a), which leads to an increase in resource efficiency (Tsimoshynska et al., 2021). Y. Huang et al. (2020) confirmed the critical role of collaboration in determining supply chain performance (Cui et al., 2020; Yuan et al., 2019). Based on this description, the following hypothesis was formulated:
H2: Supply chain collaboration has a positive effect on performance

Supply Chain Collaboration and Innovation Performance

Maintaining sustainable innovation skills is crucial for creating a competitive edge for all supply chain participants (Hong et al., 2019b). Numerous empirical studies have demonstrated that working with SC partners can help businesses increase their performance in terms of innovation (Yuan et al., 2019). Specifically, corporations interact with other supply chain partners during the collaborative innovation process, which encourages the dispersion and transfer of information and knowledge to boost the performance of the company's invention (Shin et al., 2019). Collaboration quality is a predictor of innovation performance because it involves cooperation and increases commitment through effective communication to reduce uncertainty (Li, 2020). This performance can be realized by having and maintaining long-term collaborative relationships with key partners upstream and downstream (Arsawan et al., 2021; Asree et al., 2018). Furthermore, the collaboration between suppliers is a strategic step in improving innovation performance (Kähkönen et al., 2017). Based on this description, the following hypothesis was formulated:
H3: Supply chain collaboration has a positive effect on innovation performance

Supply Chain Capabilities and Innovation Performance

Innovation strategies assist organizations in addressing sustainability issues in manufacturing processes and supply chains (Gupta et al., 2020). Innovation capability also helps organizations to enhance their performance (Parwita et al., 2021) and build agility (Arsawan et al., 2022a). The supply chain capabilities improve operations, allow organizations to coordinate overall resources, and increase innovation (Y. Liao & Li, 2019). Based on this description, the following hypothesis was formulated:
H4: Supply chain capabilities have a positive effect on innovation performance

Supply Chain Capability and Performance

Companies must acquire capabilities that allow for the efficient configuration of resources if they want to adapt to changing market conditions and gain a lasting competitive edge (Kilubi & Rogers, 2018; Yi et al., 2021). The ability of a business to locate, use, or incorporate

internal and external resources and information to enable all activities is referred to as the supply chain capability (Aboelmaged, 2018). Additionally, empirical data favors the idea that SCM capabilities lead to higher performance. For instance, W. Yu et al. (2018a) found a substantial correlation between supply chain competencies and business performance. Businesses with more robust SCM capabilities in integration, reactivity, and flexibility perform better (Flöthmann et al., 2018). As a result, it helps businesses increase product availability, deliver goods on time, and minimize inventory levels necessary to guarantee and enhance operational performance (Asamoah et al., 2020). This description led to the formulation of the following theory:

H5: Supply chain capabilities have a positive effect on performance

Innovation and Supply Chain Performance

In the long-term measure, innovation performance is the company's ability to increase the significance, usability, and performance of its products and services (Hong et al., 2019b). Competitors may find it difficult to imitate when innovations that generate uniqueness and value contribute vitally to improving supply chain performance. This improved supply chain performance can be obtained by encouraging relational exchange and innovation and working with partners to detect areas needed for improvement (Maldonado-Guzmán et al., 2020). Furthermore, innovation, including changes in products, services, processes, and management, affects the interactions between producers and suppliers or producers and customers (Parwita et al., 2021). Even though the relationship between innovation and supply chain performance has not been investigated in any of the leading SCM literature, innovation performance will positively affect performance, particularly in the logistic environment. This description led to the formulation of the following theory:

H6: Innovation performance has a positive effect on supply chain performance

The moderating role of knowledge sharing

In the context of innovation performance, knowledge sharing refers to exchanging knowledge between companies through their supply chain members (Fosso Wamba et al., 2020). The success of this collaboration is determined by communication and information sharing, although it is difficult for most companies (Baah et al., 2021b). In the supply chain context, knowledge is a source of power; therefore, it is often guarded and protected (Li, 2020). Nonetheless, knowledge and information sharing build innovation capabilities by increasing organizations' capacity to learn from one another. It can also strengthen innovation performance because it involves social interaction, the exchange of knowledge, experience, and skills in research and development (Wang & Hu, 2020). For organizations, knowledge capital is a very strategic resource, and sharing in the supply chain is an effort to develop and manage knowledge to achieve a competitive advantage (Dung et al., 2020; Flöthmann et al., 2018). Furthermore, in supply chain collaboration, direct and indirect interaction with knowledge sources such as suppliers, buyers, or other partners is a strategy for acquiring new knowledge (do Canto et al., 2020). Therefore, the collaboration between supply chains can be strengthened by knowledge sharing to build performance in the future. Based on this description, the following hypothesis was formulated:

H7: Knowledge sharing moderates the supply chain collaboration and innovation performance.
H8: Knowledge sharing moderates the relationship between supply chain collaboration and supply chain performance.

This study examines the determinants of supply chain performance, namely supply chain collaboration, capabilities, and innovation performance. Moreover, the study also explores the role of knowledge sharing in moderating the relationship between supply chain collaboration and innovation performance and supply chain collaboration and supply chain performance. The research framework is shown in Figure 1.

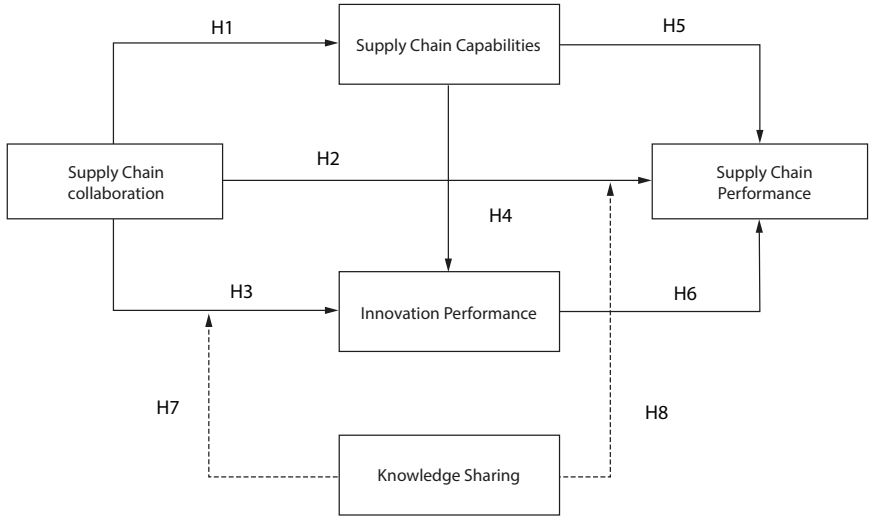

Figure 1. Research framework

2. Research methods

2.1. Sampling procedure

The population of this study was 179 SMEs spread across nine districts in Bali, Indonesia. In this study, we used a saturated sample to obtain optimal data by involving 537 respondents, including assistants and operational managers, who are assumed to be the corporate executives who make strategic decisions on supply chains. In order to improve the survey's performance and substance, a pre-test employing a questionnaire with 69 instrument questions was conducted by three expert academics. In addition, each participating company's production manager was given a survey package with a cover letter detailing the study's goals, a questionnaire, and pre-stamped envelopes with return addresses. The respondents completed the questionnaire and were asked to comment on the items' clarity, wording, and comprehension. In the trial, the overall instrument design and content were also considered. Consequently, no statement was eliminated, and only minor adjustments were suggested from the first test or trial replies.

2.2. Measurement

The variable was evaluated by adopting previous works that collected data using a Likert scale from 1 to 7 ("1-strongly disagreed" to "7-strongly agreed"). Sixteen indicators from Chen et al. (2017) were used to measure four aspects of supply chain collaboration. Next, the capability was adopted from Asamoah et al. (2020) with 17 indicators. We also used nine indicators adopted from Hong et al. (2019a) to evaluate the innovation performance. Supply chain performance was examined across three dimensions using a total of 14 indicators that were taken from Asamoah et al. (2020); Lee et al. (2007), and knowledge sharing across two dimensions using a total of 13 indicators were taken from Lei et al. (2020).

Further, PLS-SEM is a helpful technique for validating theories by testing research models (Hair Jr et al., 2017). As a result, the supply chain management model's postulated relationships were tested in this study using SmartPLS 3.2.7 software. Furthermore, by analyzing the measurement model, the method was also utilized to assess the construct validity and reliability. Lastly, it was applied to test multi-group analysis to evaluate the moderating influence of knowledge sharing (Hair et al., 2016).

3. Result

3.1. Respondent profiles

One hundred seventy-nine SMEs in Bali, Indonesia, contributed 537 respondents to this study. Operational, assistant, and primary directors all received questionnaires requesting information on strategic policies relating to supply chain management to meet the study's objectives. Judging from experience, respondents with a range of 6–10 years and 16–20 years have the highest experience with 33.7% and 30.4%, respectively, indicating that it was crucial to building collaboration between stakeholders to achieve supply chain performance (Damert et al., 2020; Dey et al., 2021). In terms of age, respondents with an age range of 25–30. 31–35 had the highest percentage, namely 30.2% with a bachelor's level of education, as the main potential for building knowledge sharing practices that produce knowledge quality (Arsawan et al., 2022b). Further, respondents were dominated by male respondents (76.7%). They were in the position of operational managers at 40.06%, indicating that decision-making regarding the supply chain is linked to responsibilities at the managerial level. Table 1 shows the demographic information from the respondents.

Table 1. Demographic facts

Characteristics	Frequency	Percentage
Experiences		
<5	2	4.00
6–10	181	33.7
11–15	82	15.3
16–20	163	30.4
>20	109	20.3

End of Table 1

Characteristics	Frequency	Percentage
Age		
<25	25	4.70
25–30	162	30.20
31–35	162	30.20
36–40	141	26.30
41–45	47	8.80
Educational Level		
Bachelor	492	91.60
Master	41	7.70
Doctor	4	0.70
Gender		
Male	125	23.30
Female	412	76.70
Level of positions		
Manager	121	22.54
Assistant Managers	201	37.40
Operational Managers	215	40.06

3.2. Outer model measurement

Table 2 shows that the current model was built using 69 indicators from 5 variables. A measure of model dependability, Cronbach's alpha, gave a value of 0.7, deemed a suitable measurement (Hair et al., 2016). The convergent validity of this model was assessed using the composite reliability (CR), average variance extract (AVE), and item reliability generated from each variable. According to Table 2 all values satisfied these requirements. Additionally, each item's loading factors at the individual level were higher than 0.7 (Hair Jr et al., 2017).

The discriminant validity of this study was confirmed using the HTMT criteria, and the HTMT ratio value should be 0.85, while values up to 0.90 are acceptable (Hair Jr et al., 2017). As shown in Table 3 all the HTMT ratios fell below 0.85, demonstrating that the study model's discriminant validity complied with the standards.

Table 2. Instrument reliability test

Variables	Items*	Cronbach's Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Supply chain collaboration			1.000		
	Internal collaboration	0.786	0.837	0.874	0.700
	Collaboration with supplier	0.899	0.911	0.924	0.671
	Collaboration with customer	0.847	0.858	0.898	0.688
	Collaboration with competitors and others	0.837	0.841	0.902	0.755

End of Table 2

Variables	Items*	Cronbach's Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Supply chain capabilities			1.000		
	Information exchange	0.832	0.956	0.893	0.704
	Integration	0.833	0,887	0.893	0.683
	Coordination	0.846	0,869	0.887	0.612
	Responsiveness	0.860	0.897	0.911	0.725
Innovation performance			1.000		
	Product innovation	0.856	0.864	0.912	0.776
	Process innovation	0.885	0.890	0.929	0.813
	Management innovation	0.888	0.889	0.930	0.816
Supply chain performance			1.000		
	Reliability	0.801	0.815	0.868	0.623
	Efficiency	0.870	0.897	0.914	0.731
	Flexibility	0.864	0.870	0.901	0.647
Knowledge sharing			1.000		
	Explicit	0.854	0.857	0.892	0.579
	Tacit	0.828	0.841	0.872	0.599

Table 3. HTMT Heterotrait-Monotrait Ratio (HTMT)

Constructs	SCCol	SCCap	IP
Supply chain capabilities	0.534		
Innovation performance	0.485	0.354	
Supply chain performance	0.394	0.475	0.317

Note: *SCCo – Supply chain collaboration, SCCs – supply chain capabilities, IP – innovation performance, SCP – supply chain performance.

3.3. Inner model measurement

Tenenhaus' structural model check goodness of fit index score of 0.482 suggested that the model's fitness was high (Tenenhaus et al., 2005). The examination of the normal fit index value (0.684) and the standardized root mean square residual value showed that the model was fit (0.113). The R2 test revealed that supply chain innovation and performance accounted for 0.311 (31.1%) of the variation in performance. Last but not least, all Q^2 scores were positive, demonstrating that all components had excellent predictive power (Chin et al., 2020).

Five of the six direct relationship hypotheses were supported, according to the data analysis findings (Table 4). The path coefficient of 0.462 and a t-statistic of 11,363 greater than 1.96 demonstrated a strong positive relationship between supply chain collaboration and capabilities, and hypothesis 1 was accepted. Since there was a significant positive correlation between supply chain collaboration and performance (β = 0.239, STDEV 0.041, T Statistics 4.429 > 1.96), H2 was acceptable. A significant positive link between supply chain

Table 4. Collaboration within the supply chain's impact on capacities, innovation, and supply chain effectiveness

Constructs	Direct		Indirect		Total	
	β	t-value	β	t-value	β	t-value
Supply Chain Collaboration -> Supply Chain Capabilities	0.462	11.363	–	–	–	–
Supply Chain Collaboration -> Supply Chain Performance	0.239	4.429	0.106	4.250	0.345	5.882
Supply Chain Collaboration -> Innovation Performance	0.187	4.875	0.139	5.140	0.326	5.806
Supply Chain Capabilities-> Innovation Performance	0.300	6.098	–	–	–	–
Supply Chain Capabilities -> Supply Chain Performance	0.230	4.858	0.021	1.363	0.013	1.375
Innovation Performance -> Supply Chain Performance	0.071	1.433	–	–	–	–

Table 5. Testing of moderation effects

Constructs	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decisions
Supply Chain Collaboration -> Knowledge sharing -> Innovation Performance	0.189	0.199	0.033	5.806	0.000	H10 = Supported
Supply Chain Collaboration -> Knowledge sharing -> Supply Chain Performance	0.040	0.043	0.040	0.987	0.324	H11 = Not supported

collaboration and innovation performance (β = 0.187, STDEV 0.038, T Statistic 4.875 > 1.96) further supports H3. H4 was acceptable since there was a significant positive association between supply chain capabilities and innovation performance (β = 0.300, STDEV 0.049, T Statistics 6.098 > 1.96). Since supply chain performance and capacities have a significant positive relationship (β = 0.230, STDEV 0.047, T Statistics 4.858 > 1.96), H5 was acceptable. Because innovation and supply chain performance were insignificant (β = 0.071, STDEV 0.050, T Statistics 1.4331.96), hypothesis 6 was not accepted.

This study also examined the moderating variable (Table 5) Multigroup-analysis utilizing PLS was used to explore the moderating role of knowledge sharing (Henseler & Fassott, 2010). In addition, the relationship between supply chain collaboration and innovation performance was also evaluated. Besides, knowledge sharing was found to be a moderator (β = 0.189, STDEV 0.033, T Statistics 5.806 > 1.96, PV 0.000). As a result, hypothesis 7 is confirmed. However, it did not attenuate the relationship between supply chain collaboration and performance (β = 0.040, STDEV 0.040, T Statistics 0.9871.96, PV 0.324); hence, hypothesis 8 was rejected.

4. Discussion and theoretical implications

According to the analysis's findings, supply chain collaboration considerably improved capabilities. It was consistent with previous studies that collaboration enhanced capabilities through the integration of resources among supply chain partners (S. H. Liao & Kuo, 2014; Rajaguru & Matanda, 2019), and improved efficiency in the areas of planning, purchasing, and achieving sales goals (Chand et al., 2020). In addition, collaboration increases productivity, lowers transaction costs and increases resource availability (Chen et al., 2017; Um & Kim, 2019).

The relationship between collaboration and innovation performance was significantly positive and reinforced previous results (Nguyen et al., 2019) that collaboration was an essential trigger for innovation, especially with key partners upstream and downstream (Asree et al., 2018). In addition, the relationship between supply chain capabilities and innovation performance was significantly positive and supported (Hong et al., 2019a) that capability increased the acceleration of value creation and innovation (Kumar et al., 2020). Likewise, the relationship between supply chain capabilities and performance was significantly positive. It was in line with Asamoah et al. (2020) that capabilities assisted organizations in identifying and assimilating internal or external resources to achieve sustainable performance (Mandal, 2017; Z. Yu et al., 2018b).

Knowledge sharing moderated the relationship between supply chain collaboration and innovation performance in the moderation test. It suggested that the relationship between collaboration and innovation was strengthened by knowledge sharing, which can be obtained from internal sources of the organization, i.e., employees, or external sources, i.e., government agencies, consultants, universities, and research institutions (Jimenez-Jimenez et al., 2019). Organizational supply chain partners were essential for creating new knowledge and learning. They also have an important role in the innovation realization of organizations (Kumar et al., 2020). Meanwhile, knowledge sharing was not a moderating variable in the relationship between supply chain collaboration and performance. It indicated that the relationship could not be strengthened by sharing knowledge. This study contradicted Attia and Essam Eldin (2018) finding that denoted sharing between supply chain members can accelerate the knowledge flow, increase supply chain efficiency and effectiveness, or enable organizations to respond quickly to changing customer needs.

This study enhanced the literature on supply chain management which can be explained as follows. First, the SCP was assessed by integrating innovation performance into the performance model. According to the data analysis, the collaboration integration model for SCP was appropriate. The insertion of a capability in the innovation performance model increased the explanatory power of the SCP model. Conceptually, these results strengthened the collaboration-capabilities-performance model in the SME sector (Dey et al., 2021; Singhry, 2015; Zaridis et al., 2021). It showed that within SCP, collaboration could simultaneously strengthen the influence of capabilities and innovation on the model. Therefore, in the SMEs context, the SCP model conceptually expanded to become SC Collaboration-SC Capabilities and filled gaps in the literature (Bravo et al., 2017; Y. Liao & Li, 2019; Zimmermann et al., 2016) that there was no previous study had integrated these three models. Furthermore, this study proved

that supply chain capabilities built with effective and efficient collaboration were essential strengths as a predictor of SCM (Hong et al., 2019b) in obtaining resources and developing organizational capabilities to create competitive advantage.

Second, this study unexpectedly discovered a non-significant impact of innovation performance as a predictor of SCP. Therefore, the analysis offered a new result: innovation performance could not improve supply chain performance. It contradicted Seo et al. (2014), Singhry (2015) finding, which stated the role of innovation as a significant predictor in building supply chain performance. A possible explanation was that SME supply chain performance involved more collaboration since SMEs needed to define or understand their competitive strategy (Dey et al., 2021; Zaridis et al., 2021). Consequently, companies were required to make continuous improvements through knowledge sharing to gain external knowledge, technology, and management idea (Arsawan et al., 2022b).

Third, this study showed how knowledge sharing moderated supply chain collaboration and innovation performance. An essential role of knowledge sharing in the supply chain is social interaction, exchange of knowledge, experience, and skills in research and development (Wang & Hu, 2020). Therefore, it needed to be maintained and protected to increase capacity and strengthen innovation performance. In the context of theory, this study contributed to enriching stakeholder theory (E. R. Freeman, 1984) that organizations were responsible for all activities between supply chains (Y. C. Huang et al., 2021). Strong collaboration between organizations has increased capabilities and performance in building competitive advantage. Moreover, collaboration was the most critical determinant, enabling value creation for capabilities (Tsimoshynska et al., 2021), and innovation (Damert et al., 2020). This result was consistent with Trachenko et al. (2021), which stated that the supply chain was relevant from the stakeholder theory perspective because it required companies to interact with various stakeholders in a business approach.

5. Managerial implications

This study provided managerial insight as follows. Firstly, the collaboration result with supply chain partners had incremental improvements in capabilities and innovations, such as process improvements, more efficient operations, better quality, and lower costs, as well as radical innovations, including the implementation of new technologies and changes in strategy. Therefore, it can develop and improve their capacity for innovation. Hence, internal and external collaboration has implications for customer engagement: strengthening the market structure. Second, this study contributed to evaluating and improving collaborative practices in supply chains to increase efficiency. Consequently, making a formal agreement in a business context was necessary to keep all parties safe in the cooperation process. Third, collaboration among supply chain members can be an opportunity to practice knowledge sharing. Consequently, it can increase the transfer of knowledge, experience, and skills in research and development to make strategic decisions that improve performance.

The expected consequence is that SMEs become more resilient and have several options and strategic flexibility that can be used as guidance when encountering various risks. Fourth, SME managers need to re-examine the business-to-business relationships between supply

chain partners to ensure the compatibility and conformity of values, goals, and attitudes, which maximizes benefits for all the supply chain members. These results offer insight to SME managers on managing collaboration structures and improving inter-organizational capabilities to maximize the benefits derived from innovation and supply chain performance. Eventually, in an archipelagic country like Indonesia, our research results offer the best practice that solid supply chain collaboration provides a new perspective on how to structure collaborative structures that are mutually reinforcing, beneficial, and provide added value. A strong collaboration structure will reduce costs incurred, thereby increasing operational performance to build a resilient supply chain. In addition, collaboration is the foundation for enhancing capabilities and knowledge sharing efforts. As a result, accumulating collaborative knowledge will become a new force in dealing with environmental dynamics, uncertainty, and even crises.

6. Limitations and further research

Although this study contributed to theory and practice, it has some limitations that should be explored further. First, the operating strategy was closely related to the competitive environment, and the combination of various operating strategies can assist the company in surviving such a situation. Moreover, this study single-handedly investigated the effect of supply chain collaboration and capabilities on innovation and supply chain performance. Thus, future studies can consider the combination of operating strategy dimensions (cost, quality, flexibility, and delivery) as important variables determining supply chain performance and the role of leadership in coordinating or implementing strategies to improve operational quality. Second, supply chain collaboration has several dimensions, such as supplier, customer, and internal integrations, which were not separately examined in this study. Hence, it is highly recommended to re-examine the above model by separating these dimensions into essential variables. Third, the hypotheses were tested based on 537 responses from 179 SMEs in Indonesia. Subsequently, future studies should focus on obtaining data from different countries, allowing improvisation of the generalizability and comparability of the results and interesting findings.

Conclusions

This study aimed to examine the supply chain performance drivers, namely collaboration, capabilities, and innovation, both direct and indirect. Then, it examined the role of knowledge sharing as a moderator variable. Four important conclusions were obtained from this study. Firstly, supply chain performance is a complex construct that consists not only of supply chain collaboration but also of supply chain capabilities and knowledge sharing. Second, the determining factor that has the most influence on supply chain performance is supply chain collaboration because it has the most significant total effect compared to other determinants. These findings underlined the critical role of collaboration in determining supply chain performance. Third, this study unexpectedly discovered a non-significant impact of innovation performance as a predictor of supply chain performance. These results proved that SMEs are still focused on building collaboration and capabilities. Although not directly

significant, strengthening knowledge sharing practices were expected to improve supply chain performance in the future. Fourth, knowledge sharing played a role in strengthening the relationship between collaboration and innovation performance. With these results, SMEs are expected to build collaboration gradually to improve their innovation capabilities and performance. On the other hand, by sharing knowledge between supply chain collaborations, innovation performance will increase.

Disclosure statement

Authors declare that they do not have any competing financial, professional, or personal interests from other parties.

References

Aboelmaged, M. (2018). The drivers of sustainable manufacturing practices in Egyptian SMEs and their impact on competitive capabilities: A PLS-SEM model. *Journal of Cleaner Production*, *175*, 207–221. https://doi.org/10.1016/j.jclepro.2017.12.053

Anser, M. K., Yousaf, Z., Khan, A., & Usman, M. (2020). Towards innovative work behavior through knowledge management infrastructure capabilities: Mediating role of functional flexibility and knowledge sharing. *European Journal of Innovation Management*, *24*(2), 461–480. https://doi.org/10.1108/EJIM-09-2019-0250

Arsawan, I. W. E., Hariyanti, N. K. D., Atmaja, I. M. A. D. S., Suhartanto, D., & Koval, V. (2022a). Developing organizational agility in SMEs: An investigation of innovation's roles and strategic flexibility. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 149. https://doi.org/10.3390/joitmc8030149

Arsawan, I. W. E., Koval, V., Duginets, G., Kalinin, O., & Korostova, I. (2021). The impact of green innovation on environmental performance of SMEs in an emerging economy. *E3S Web of Conferences*, *255*, 1012. https://doi.org/10.1051/e3sconf/202125501012

Arsawan, I. W. E., Koval, V., Suhartanto, D., Harbar, Z., & Maslennikov, Y. (2022b). Employee-driven innovation capability: The role of knowledge, creativity, and time sufficiency. *Intellectual Economics*, *16*(2), 138–165. https://doi.org/10.13165/IE-22-16-2-08

Asamoah, D., Agyei-Owusu, B., Andoh-Baidoo, F. K., & Ayaburi, E. (2020). Inter-organizational systems use and supply chain performance: Mediating role of supply chain management capabilities. *International Journal of Information Management*, *58*, 102195. https://doi.org/10.1016/j.ijinfomgt.2020.102195

Aslam, H., Blome, C., Roscoe, S., & Azhar, T. M. (2020). Determining the antecedents of dynamic supply chain capabilities. *Supply Chain Management: An International Journal*, *25*(4), 427–442. https://doi.org/10.1108/SCM-02-2019-0074

Asree, S., Cherikh, M., & Gopalan, S. (2018). The impact of supply chain responsiveness and strategic supply chain collaboration on innovation performance. *International Journal of Business Performance and Supply Chain Modelling*, *10*(2), 131–145. https://doi.org/10.1504/IJBPSCM.2018.098306

Attia, A., & Essam Eldin, I. (2018). Organizational learning, knowledge management capability and supply chain management practices in the Saudi food industry. *Journal of Knowledge Management*, *22*(6), 1217–1242. https://doi.org/10.1108/JKM-09-2017-0409

Baah, C., Acquah, I. S. K., & Ofori, D. (2021a). Exploring the influence of supply chain collaboration on supply chain visibility, stakeholder trust, environmental and financial performances: A partial least square approach. *Benchmarking: An International Journal*, *29*(1), 172–193. https://doi.org/10.1108/BIJ-10-2020-0519

Baah, C., Opoku Agyeman, D., Acquah, I. S. K., Agyabeng-Mensah, Y., Afum, E., Issau, K., Ofori, D., & Faibil, D. (2021b). Effect of information sharing in supply chains: Understanding the roles of supply

chain visibility, agility, collaboration on supply chain performance. *Benchmarking: An International Journal*. https://doi.org/10.1108/BIJ-08-2020-0453

Bravo, M. I. R., Montes, F. J. L., & Moreno, A. R. (2017). Open innovation in supply networks: An expectation disconfirmation theory perspective. *Journal of Business & Industrial Marketing*.

Chand, P., Thakkar, J. J., & Ghosh, K. K. (2020). Analysis of supply chain performance metrics for Indian mining & earthmoving equipment manufacturing companies using hybrid MCDM model. *Resources Policy*, *68*, 101742. https://doi.org/10.1016/j.resourpol.2020.101742

Chen, L., Zhao, X., Tang, O., Price, L., Zhang, S., & Zhu, W. (2017). Supply chain collaboration for sustainability: A literature review and future research agenda. *International Journal of Production Economics*, *194*, 73–87. https://doi.org/10.1016/j.ijpe.2017.04.005

Chin, W., Cheah, J. H., Liu, Y., Ting, H., Lim, X. J., & Cham, T. H. (2020). Demystifying the role of causal-predictive modeling using partial least squares structural equation modeling in information systems research. *Industrial Management and Data Systems*, *120*(12), 2161–2209. https://doi.org/10.1108/IMDS-10-2019-0529

Cui, L., Gao, M., Dai, J., & Mou, J. (2020). Improving supply chain collaboration through operational excellence approaches: An IoT perspective. *Industrial Management & Data Systems*. https://doi.org/10.1108/IMDS-01-2020-0016

Damert, M., Koep, L., Guenther, E., & Morris, J. (2020). Stakeholders and socially responsible supply chain management: The moderating role of internationalization. *Sustainability Accounting, Management and Policy Journal*, *12*(4), 667–694. https://doi.org/10.1108/SAMPJ-03-2019-0092

Dey, P. K., Yang, G.-l., Malesios, C., De, D., & Evangelinos, K. (2021). Performance management of supply chain sustainability in small and medium-sized enterprises using a combined structural equation modelling and data envelopment analysis. *Computational Economics*, *58*(3), 573–613. https://doi.org/10.1007/s10614-019-09948-1

do Canto, N. R., Bossle, M. B., Vieira, L. M., & De Barcellos, M. D. (2020). Supply chain collaboration for sustainability: A qualitative investigation of food supply chains in Brazil. *Management of Environmental Quality: An International Journal*. https://doi.org/10.1108/MEQ-12-2019-0275

Dung, T. Q., Bonney, L. B., Adhikari, R. P., & Miles, M. P. (2020). Entrepreneurial orientation, knowledge acquisition and collaborative performance in agri-food value-chains in emerging markets. *Supply Chain Management*, *25*(5), 521–533. https://doi.org/10.1108/SCM-09-2019-0327

Ferraris, A., Giachino, C., Ciampi, F., & Couturier, J. (2021). R&D internationalization in medium-sized firms: The moderating role of knowledge management in enhancing innovation performances. *Journal of Business Research*, *128*, 711–718. https://doi.org/10.1016/j.jbusres.2019.11.003

Flöthmann, C., Hoberg, K., & Gammelgaard, B. (2018). Disentangling supply chain management competencies and their impact on performance: A knowledge-based view. *International Journal of Physical Distribution and Logistics Management*, *48*(6), 630–655. https://doi.org/10.1108/IJPDLM-02-2017-0120

Fosso Wamba, S., Queiroz, M. M., & Trinchera, L. (2020). Dynamics between blockchain adoption determinants and supply chain performance: An empirical investigation. *International Journal of Production Economics*, *229*, 107791. https://doi.org/10.1016/j.ijpe.2020.107791

Freeman, R. E. (1984). *Strategic management: A stakeholder approach* (Pitman Series in Business and Public Policy). Pitman.

Freeman, R. E., Harrison, J. S., & Zyglidopoulos, S. (2018). *Stakeholder theory: Concepts and strategies*. Cambridge University Press. https://doi.org/10.1017/9781108539500

Gupta, H., Kusi-Sarpong, S., & Rezaei, J. (2020). Barriers and overcoming strategies to supply chain sustainability innovation. *Resources, Conservation and Recycling*, *161*, 104819. https://doi.org/10.1016/j.resconrec.2020.104819

Hair, Jr. J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage Publications.

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107–123. https://doi.org/10.1504/IJMDA.2017.087624

Henseler, J., & Fassott, G. (2010). Testing moderating effects in PLS path models: An illustration of available procedures. In *Handbook of partial least squares* (pp. 713–735). Springer. https://doi.org/10.1007/978-3-540-32827-8_31

Hong, J., Liao, Y., Zhang, Y., & Yu, Z. (2019a). The effect of supply chain quality management practices and capabilities on operational and innovation performance: Evidence from Chinese manufacturers. *International Journal of Production Economics*, *212*, 227–235. https://doi.org/10.1016/j.ijpe.2019.01.036

Hong, J., Zheng, R., Deng, H., & Zhou, Y. (2019b). Green supply chain collaborative innovation, absorptive capacity and innovation performance: Evidence from China. *Journal of Cleaner Production*, *241*, 118377. https://doi.org/10.1016/j.jclepro.2019.118377

Hu, W., Shou, Y., Kang, M., & Park, Y. (2020). Risk management of manufacturing multinational corporations: The moderating effects of international asset dispersion and supply chain integration. *Supply Chain Management*, *25*(1), 61–76. https://doi.org/10.1108/SCM-01-2019-0009

Huang, Y. C., Borazon, E. Q., & Liu, J. M. (2021). Antecedents and consequences of green supply chain management in Taiwan's electric and electronic industry. *Journal of Manufacturing Technology Management*, *32*(5), 1066–1093. https://doi.org/10.1108/JMTM-05-2020-0201

Huang, Y., Han, W., & Macbeth, D. K. (2020). The complexity of collaboration in supply chain networks. *Supply Chain Management*, *25*(3), 393–410. https://doi.org/10.1108/SCM-11-2018-0382

Huge-Brodin, M., Sweeney, E., & Evangelista, P. (2020). Environmental alignment between logistics service providers and shippers – a supply chain perspective. *International Journal of Logistics Management*, *31*(3), 575–605. https://doi.org/10.1108/IJLM-04-2019-0101

Jafari, T., Zarei, A., Azar, A., & Moghaddam, A. (2021). The impact of business intelligence on supply chain performance with emphasis on integration and agility – a mixed research approach. *International Journal of Productivity and Performance Management*. https://doi.org/10.1108/IJPPM-09-2021-0511

Jimenez-Jimenez, D., Martínez-Costa, M., & Sanchez Rodriguez, C. (2019). The mediating role of supply chain collaboration on the relationship between information technology and innovation. *Journal of Knowledge Management*, *23*(3), 548–567. https://doi.org/10.1108/JKM-01-2018-0019

Kähkönen, A. K., Lintukangas, K., Ritala, P., & Hallikas, J. (2017). Supplier collaboration practices: Implications for focal firm innovation performance. *European Business Review*, *29*(4), 402–418. https://doi.org/10.1108/EBR-04-2016-0058

Kazmi, S. W., & Ahmed, W. (2021). Understanding dynamic distribution capabilities to enhance supply chain performance: A dynamic capability view. *Benchmarking: An International Journal*. https://doi.org/10.1108/BIJ-03-2021-0135

Kilubi, I., & Rogers, H. (2018). Bridging the gap between supply chain risk management and strategic technology partnering capabilities: Insights from social capital theory. *Supply Chain Management*, *23*(4), 278–292. https://doi.org/10.1108/SCM-02-2017-0091

Kleine Jäger, J., & Piscicelli, L. (2021). Collaborations for circular food packaging: The set-up and partner selection process. *Sustainable Production and Consumption*, *26*, 733–740. https://doi.org/10.1016/j.spc.2020.12.025

Kumar, V., Jabarzadeh, Y., Jeihouni, P., & Garza-Reyes, J. A. (2020). Learning orientation and innovation performance: The mediating role of operations strategy and supply chain integration. *Supply Chain Management*, *25*(4), 457–474. https://doi.org/10.1108/SCM-05-2019-0209

Lee, C. W., Kwon, I. G., & Severance, D. (2007). Relationship between supply chain performance and degree of linkage among supplier, internal integration, and customer. *Supply Chain Management: An International Journal*, *12*(6), 444–452. https://doi.org/10.1108/13598540710826371

Lei, H., Gui, L., & Le, P. B. (2020). Linking transformational leadership and frugal innovation: The mediating role of tacit and explicit knowledge sharing. *Journal of Knowledge Management*, *25*(7), 1832–1852. https://doi.org/10.1108/JKM-04-2020-0247

Li, G. (2020). The impact of supply chain relationship quality on knowledge sharing and innovation performance: Evidence from Chinese manufacturing industry. *Journal of Business and Industrial Marketing*. https://doi.org/10.1108/JBIM-02-2020-0109

Liao, S. H., & Kuo, F. I. (2014). The study of relationships between the collaboration for supply chain, supply chain capabilities and firm performance: A case of the Taiwans TFT-LCD industry. *International Journal of Production Economics*, *156*, 295–304. https://doi.org/10.1016/j.ijpe.2014.06.020

Liao, S.-H., Hu, D.-C., & Chen, S.-T. (2022). Supply chain integration, capability and performance – a business-to-business network cooperation. *Journal of Business & Industrial Marketing*, *37*(5), 1127–1137. https://doi.org/10.1108/JBIM-10-2020-0467

Liao, Y., & Li, Y. (2019). Complementarity effect of supply chain competencies on innovation capability. *Business Process Management Journal*, *25*(6), 1251–1272. https://doi.org/10.1108/BPMJ-04-2018-0115

Lin, H. F. (2017). Antecedents and consequences of electronic supply chain management diffusion: The moderating effect of knowledge sharing. *International Journal of Logistics Management*, *28*(2), 699–718. https://doi.org/10.1108/IJLM-01-2016-0023

Lin, Y. S., & Chen, M. (2021). Implementing TRIZ with supply chain management in new product development for small and medium enterprises. *Processes*, *9*(4), 614. https://doi.org/10.3390/pr9040614

Liu, W., Liang, Y., Wei, S., & Wu, P. (2020a). The organizational collaboration framework of smart logistics ecological chain: A multi-case study in China. *Industrial Management and Data Systems*. https://doi.org/10.1108/IMDS-02-2020-0082

Liu, W., Yan, X., Si, C., Xie, D., & Wang, J. (2020b). Effect of buyer-supplier supply chain strategic collaboration on operating performance: Evidence from Chinese companies. *Supply Chain Management*, *25*(6), 823–839. https://doi.org/10.1108/SCM-12-2019-0430

Maldonado-Guzmán, G., Garza-Reyes, J. A., Pinzón-Castro, S. Y., & Kumar, V. (2020). Innovation capabilities and performance: Are they truly linked in SMEs? *International Journal of Innovation Science*, *11*(1), 48–62. https://doi.org/10.1108/IJIS-12-2017-0139

Mandal, S. (2017). The influence of dynamic capabilities on hospital-supplier collaboration and hospital supply chain performance. *International Journal of Operations and Production Management*, *37*(5), 664–684. https://doi.org/10.1108/IJOPM-05-2016-0249

Mandal, S., & Saravanan, D. (2019). Exploring the influence of strategic orientations on tourism supply chain agility and resilience: An empirical investigation. *Tourism Planning & Development*, *16*(6), 612–636. https://doi.org/10.1080/21568316.2018.1561506

Nandi, M. L., Nandi, S., Moya, H., & Kaynak, H. (2020). Blockchain technology-enabled supply chain systems and supply chain performance: A resource-based view. *Supply Chain Management*, *25*(6), 841–862. https://doi.org/10.1108/SCM-12-2019-0444

Nguyen, M. A. T., Lei, H., Vu, K. D., & Le, P. B. (2019). The role of cognitive proximity on supply chain collaboration for radical and incremental innovation: A study of a transition economy. *Journal of Business & Industrial Marketing*, *34*(3), 591–604. https://doi.org/10.1108/JBIM-07-2017-0163

Parwita, G. B. S., Arsawan, I. W. E., Koval, V., Hrinchenko, R., Bogdanova, N., & Tamošiūnienė, R. (2021). Organizational innovation capability: Integrating human resource management practice, knowledge management and individual creativity. *Intellectual Economics*, *15*(2), 22–45.

Rajaguru, R., & Matanda, M. J. (2019). Role of compatibility and supply chain process integration in facilitating supply chain capabilities and organizational performance. *Supply Chain Management*, *24*(2), 315–330. https://doi.org/10.1108/SCM-05-2017-0187

Rungsithong, R., & Meyer, K. E. (2020). Trust and knowledge sharing in context: A study of international buyer-supplier relationships in Thailand. *Industrial Marketing Management*, *88*, 112–124. https://doi.org/10.1016/j.indmarman.2020.04.026

Schmidt, C. G., & Wagner, S. M. (2019). Blockchain and supply chain relations: A transaction cost theory perspective. *Journal of Purchasing and Supply Management*, *25*(4), 100552. https://doi.org/10.1016/j.pursup.2019.100552

Schwab, K. (2019). *The global competitiveness report 2019*. World Economic Forum. http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

Seo, Y. J., Dinwoodie, J., & Kwak, D. W. (2014). The impact of innovativeness on supply chain performance: Is supply chain integration a missing link? *Supply Chain Management*, *19*(5–6), 733–746. https://doi.org/10.1108/SCM-02-2014-0058

Shin, N., Park, S. H., & Park, S. (2019). Partnership-based supply chain collaboration: Impact on commitment, innovation, and firm performance. *Sustainability*, *11*(2), 1–19. https://doi.org/10.3390/su11020449

Singhry, H. B. (2015). Effect of supply chain technology, supply chain collaboration and innovation capability on supply chain performance of manufacturing companies. *Journal of Business Studies Quarterly*, *7*(2), 258–273.

Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics & Data Analysis*, *48*(1), 159–205. https://doi.org/10.1016/j.csda.2004.03.005

Trachenko, L., Lazorenko, L., Maslennikov, Y., Hrinchenko, Y., Arsawan, I. W. E., & Koval, V. (2021). Optimization modeling of business processes of engineering service enterprises in the national economy. *Natsional'nyi Hirnychyi Universytet. Naukovyi Visnyk*, *4*, 165–171. https://doi.org/10.33271/nvngu/2021-4/165

Tsimoshynska, O., Koval, M., Kryshtal, H., Filipishyna, L., Arsawan, W. E., & Koval, V. (2021). Investing in road construction infrastructure projects under public-private partnership in the form of concession. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, *2*, 184–192. https://doi.org/10.33271/nvngu/2021-2/184

Tukamuhabwa, B., Mutebi, H., & Kyomuhendo, R. (2021). Competitive advantage in SMEs: Effect of supply chain management practices, logistics capabilities and logistics integration in a developing country. *Journal of Business and Socio-Economic Development*. https://doi.org/10.1108/JBSED-04-2021-0051

Um, K.-H., & Kim, S.-M. (2019). The effects of supply chain collaboration on performance and transaction cost advantage: The moderation and nonlinear effects of governance mechanisms. *International Journal of Production Economics*, *217*, 97–111. https://doi.org/10.1016/j.ijpe.2018.03.025

Wang, C., & Hu, Q. (2020). Knowledge sharing in supply chain networks: Effects of collaborative innovation activities and capability on innovation performance. *Technovation*, *94*, 102010. https://doi.org/10.1016/j.technovation.2017.12.002

Yi, L., Wang, Y., Upadhaya, B., Zhao, S., & Yin, Y. (2021). Knowledge spillover, knowledge management capabilities, and innovation among returnee entrepreneurial firms in emerging markets: Does entrepreneurial ecosystem matter? *Journal of Business Research*, *130*, 283–294. https://doi.org/10.1016/j.jbusres.2021.03.024

Yu, W., Chavez, R., Jacobs, M. A., & Feng, M. (2018a). Data-driven supply chain capabilities and performance: A resource-based view. *Transportation Research Part E: Logistics and Transportation Review*, *114*, 371–385. https://doi.org/10.1016/j.tre.2017.04.002

Yu, Z., Golpîra, H., & Khan, S. A. R. (2018b). The relationship between green supply chain performance, energy demand, economic growth, and environmental sustainability: An empirical evidence from developed countries. *LogForum*, *14*(4), 479–494. https://doi.org/10.17270/J.LOG.2018.304

Yuan, Y., Viet, N., & Behdani, B. (2019). The impact of information sharing on the performance of horizontal logistics collaboration: A simulation study in an agri-food supply chain. *IFAC-PapersOnLine*, *52*(13), 2722–2727. https://doi.org/10.1016/j.ifacol.2019.11.619

Zaridis, A., Vlachos, I., & Bourlakis, M. (2021). SMEs strategy and scale constraints impact on agri-food supply chain collaboration and firm performance. *Production Planning and Control*, *32*(14), 1165–1178. https://doi.org/10.1080/09537287.2020.1796136

Zimmermann, R., Ferreira, L. M. D. F., & Moreira, A. C. (2016). The influence of supply chain on the innovation process: A systematic literature review. *Supply Chain Management: An International Journal*, *21*(3), 289–304. https://doi.org/10.1108/SCM-07-2015-0266