Jurnal Kewirausahaan Cerdas dan Digital
Volume 2, Nomor 4, Agustus 2025
E-ISSN : 3046-9732, dan P-ISSN : 3046-8787, Hal. 46-60
DOI: https://doi.org/10.61132/jukerdi.v2i4.1527
Tersedia: https://ejournal.arimbi.or.id/index.php/JUKERDI

Supply Chain Visibility and Supplier Integration on Operational Resilience through Risk Management Capability in Small Manufacturing Enterprises

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Abstract. Supply chain disruptions have become a critical challenge for small manufacturing enterprises due to limited resources, supplier dependency, and inadequate risk management capabilities. This study aims to examine the influence of Supply Chain Visibility and Supplier Integration on Operational Resilience through the mediating role of Risk Management Capability. This research employs a quantitative approach with an explanatory research design. Data were collected through questionnaires distributed to small manufacturing enterprises involved in production activities and supplier relationships. The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through validity testing, reliability assessment, structural model evaluation, and mediation analysis. The results indicate that Supply Chain Visibility positively contributes to Risk Management Capability by improving access to supply chain information and supporting early risk identification. Supplier Integration also strengthens Risk Management Capability through better communication, coordination, and collaboration with suppliers. Furthermore, Risk Management Capability significantly enhances Operational Resilience and mediates the relationship between supply chain capabilities and resilience outcomes. This study highlights the importance of integrating supply chain information, supplier collaboration, and risk management practices to improve the ability of small manufacturing enterprises to adapt, recover, and maintain operational continuity during disruptions.

Keywords: Operational Resilience; Risk Management Capability; Small Manufacturing Enterprises; Supplier Integration; Supply Chain Visibility.

1. BACKGROUND

Supply chain disruptions have become a major challenge for manufacturing enterprises, particularly small manufacturing enterprises that operate with limited resources and high dependency on external partners. Recent global events, including pandemics, geopolitical instability, and economic fluctuations, have increased uncertainty in supply availability, production planning, transportation processes, and operational costs. Deshpande et al. (2023) highlighted that manufacturing supply chains are increasingly exposed to vulnerabilities caused by demand volatility, supplier instability, and operational constraints. For small enterprises, these challenges are more critical because they often lack sufficient financial resources, inventory buffers, and formal risk management systems to absorb unexpected disruptions (Azman et al., 2024). Moreover, dependency on limited suppliers may increase exposure to raw material shortages and delayed production activities (Mahmud et al., 2021). Therefore, developing the ability to maintain operational continuity, adapt to changing conditions, and recover quickly from disruptions has become essential for improving the survival and competitiveness of small manufacturing enterprises (Elimbi Moudio et al., 2022).

Previous studies have emphasized the importance of supply chain capabilities in strengthening organizational resilience. Supply Chain Visibility (SCV) enables enterprises to

Naskah Masuk: 20 Mei 2025; Revisi: 22 Juni 2025; Diterima: 22 Juli 2025; Terbit: 31 Agustus 2025

access accurate and timely information related to suppliers, inventory conditions, demand changes, and logistics activities, allowing firms to identify risks and make proactive decisions (Kalaiarasan et al., 2023; Messina et al., 2023). In addition, Supplier Integration (SI) facilitates communication, information sharing, and collaborative problem-solving between enterprises and suppliers, which improves flexibility and responsiveness during disruptions (Mahmud et al., 2021). However, visibility and integration alone may not automatically generate resilience without effective risk management capabilities. According to Yang et al. (2021), Supply Chain Risk Management Capability (RMC) functions as an organizational capability that transforms information resources and relational networks into effective risk responses. Although previous research has examined SCV, SI, and resilience relationships, limited studies have investigated RMC as a mediating mechanism connecting these capabilities with Operational Resilience, particularly in small manufacturing enterprises (Fatoki & Mora-Monge, 2025).

Based on the identified research gap, this study focuses on understanding how supply chain capabilities contribute to operational resilience through risk management mechanisms in small manufacturing enterprises. The main research question addressed in this study is: how do Supply Chain Visibility and Supplier Integration influence Operational Resilience, and to what extent does Risk Management Capability mediate these relationships? This research considers that small manufacturing enterprises require not only access to supply chain information and strong supplier relationships but also the internal capability to interpret risks, develop mitigation strategies, and reconfigure operational resources. As explained by ur Rehman et al. (2022), risk management capability represents a dynamic capability that enables organizations to respond effectively to environmental uncertainty through continuous adaptation and resource adjustment. Therefore, this study aims to empirically analyze the influence of Supply Chain Visibility and Supplier Integration on Operational Resilience through the mediating role of Risk Management Capability using a quantitative approach.

This study argues that operational resilience in small manufacturing enterprises is not developed solely through external supply chain relationships but also through internal capabilities that enable effective risk management and adaptation. From the perspective of Dynamic Capabilities Theory, enterprises must continuously develop, integrate, and reconfigure their resources to respond to environmental changes and disruptions (ur Rehman et al., 2022). Furthermore, supply chain resilience literature suggests that organizations with stronger information visibility, collaborative supplier relationships, and risk management capabilities are better prepared to sustain operations during uncertain conditions (El Baz & Ruel, 2021). Theoretically, this study contributes by extending previous research through the

integration of Supply Chain Visibility, Supplier Integration, Risk Management Capability, and Operational Resilience within the context of small manufacturing enterprises. Practically, the findings provide guidance for small businesses to improve supply chain strategies by strengthening information transparency, supplier collaboration, and risk management practices to achieve more resilient and sustainable operations (Atieh, 2025).

2. THEORETICAL STUDIES

Small Manufacturing Enterprises

Small manufacturing enterprises play an important role in economic development; however, they often face operational constraints due to limited financial resources, technological capabilities, and managerial capacity. These limitations reduce their ability to develop advanced supply chain systems and absorb external disruptions. According to Deshpande et al. (2023), small manufacturers are more vulnerable to supply chain instability because of limited operational buffers and dependence on external partners. Furthermore, Azman et al. (2024) emphasized that small enterprises frequently experience difficulties in maintaining supply continuity due to supplier dependency and restricted risk mitigation mechanisms. Therefore, strengthening supply chain capabilities becomes essential for improving adaptability and long-term operational sustainability.

Supply Chain Management

Supply Chain Management (SCM) represents an integrated approach that coordinates the movement of materials, information, financial resources, and business activities from suppliers to customers. Lambert and Knemeyer (2007) explained that effective SCM requires synchronization among supply, production, logistics, and customer activities to achieve operational efficiency. In modern business environments, SCM is not only focused on cost reduction but also on improving collaboration, flexibility, and responsiveness among supply chain actors. Mărincaş (2008) highlighted that information systems support SCM effectiveness by enabling better coordination and information exchange. Thus, SCM provides the foundation for enterprises to manage uncertainty and build stronger supply chain capabilities.

Supply Chain Visibility

Supply Chain Visibility (SCV) refers to the capability of enterprises to obtain, share, and utilize accurate and timely information across supply chain activities. Messina et al. (2023) stated that visibility enables organizations to monitor supply chain conditions, identify potential disruptions, and support effective decision-making. Furthermore, Özkanlısoy and Bulutlar (2023) explained that visibility has become increasingly important in disruptive environments because it improves transparency and information availability among supply chain partners. Through better visibility, firms can reduce uncertainty, improve coordination, and respond faster to operational changes. Sunmola and Apeji (2024) also emphasized that SCV contributes to supply chain performance by supporting proactive management and increasing organizational flexibility.

Supplier Integration

Supplier Integration (SI) describes the extent to which firms collaborate with suppliers through communication, information sharing, coordination, and joint problem-solving activities. According to Duong and Ha (2021), supplier integration strengthens supply chain performance by improving cooperation and reducing uncertainty between buyers and suppliers. Strong supplier relationships enable enterprises to coordinate production requirements, manage supply risks, and respond effectively to market changes. Moreover, Yang et al. (2024) highlighted that relational capital developed through supplier collaboration contributes to building supply chain resilience. Therefore, supplier integration is considered a strategic capability that allows enterprises to access external resources, enhance responsiveness, and maintain operational stability during uncertain conditions.

Risk Management Capability

Risk Management Capability (RMC) refers to the organizational ability to identify, evaluate, control, and respond to supply chain risks effectively. Yang et al. (2021) found that supply chain risk management capability plays an important role in helping firms anticipate disruptions and maintain operational continuity. This capability involves risk identification mechanisms, information processing, response planning, and resource adjustment. According to Barhmi (2023), effective risk management practices improve organizational agility by enabling firms to reduce uncertainty and respond quickly to environmental changes. Furthermore, Atieh (2025) emphasized that data-driven culture and strategic resilience strengthen risk management capability by improving decision accuracy and resource orchestration during disruptions.

Operational Resilience

Operational Resilience represents the ability of enterprises to maintain, adapt, and recover operational activities when facing unexpected disruptions. Shekarian and Mellat Parast (2021) explained that resilience involves preparedness, flexibility, and recovery capabilities that enable organizations to overcome supply chain disturbances. In manufacturing environments, resilience is particularly important because disruptions can directly affect production continuity, customer satisfaction, and business performance. Zhou and Hosseini (2023) emphasized that resilient supply chains require the ability to absorb shocks, adapt operational processes, and restore performance after disruptions. Therefore, developing operational resilience allows small manufacturing enterprises to survive in uncertain environments and maintain sustainable competitiveness.

Theoretical Foundation

Dynamic Capabilities Theory

Dynamic Capabilities Theory explains how organizations develop, integrate, and reconfigure resources to respond effectively to changing environments. Cristofaro and Lovallo (2022) stated that dynamic capabilities consist of sensing opportunities and threats, seizing available resources, and transforming organizational processes. In supply chain contexts, these capabilities enable firms to improve flexibility, innovation, and adaptation during disruptions. Öztürk (2024) emphasized that organizations with stronger dynamic capabilities are better positioned to achieve sustainable performance under uncertainty. Therefore, this theory provides a foundation for explaining how supply chain visibility, supplier integration, and risk management capability contribute to operational resilience.

Supply Chain Resilience Perspective

The Supply Chain Resilience Perspective focuses on the ability of supply chains to withstand disruptions, recover operations, and improve future preparedness. Shekarian and Mellat Parast (2021) explained that resilience is developed through flexibility, redundancy, collaboration, and effective risk management practices. Recent studies indicate that resilience has become a critical capability due to increasing global disruptions affecting supply availability and operational stability. Zhou and Hosseini (2023) highlighted that resilient supply chains require continuous adaptation and recovery capabilities to maintain performance. Therefore, this perspective supports the understanding that supply chain capabilities are important mechanisms for achieving operational resilience.

Relational View Theory

Relational View Theory emphasizes that competitive advantages can be created through valuable relationships and collaboration among organizations. Liu et al. (2024) explained that strategic relationships between firms and supply chain partners enhance information sharing, coordination, and joint problem-solving capabilities. In the context of supplier relationships, collaboration enables enterprises to access external resources and develop stronger responses to disruptions. Yang et al. (2024) further demonstrated that relational capital contributes significantly to supply chain resilience by improving cooperation and resource utilization. Thus, this theory supports the importance of supplier integration as a strategic mechanism for strengthening operational resilience.

Previous Studies and Research Model

Previous studies have demonstrated that *Supply Chain Visibility*, *Supplier Integration*, and *Risk Management Capability* are important factors in developing *Operational Resilience*. Huang et al. (2023) revealed that supply chain capabilities, including information visibility and resilience-oriented practices, contribute to improved organizational performance and adaptability. Similarly, Liu et al. (2024) emphasized that supply chain transparency enhances risk identification, management effectiveness, and resilience outcomes. However, most previous studies have primarily focused on direct relationships between supply chain capabilities and performance outcomes, while the mechanism through which *Risk Management Capability* mediates the relationship between *Supply Chain Visibility*, *Supplier Integration*, and *Operational Resilience* remains underexplored, particularly in small manufacturing enterprises. Therefore, this study proposes that *Supply Chain Visibility* and *Supplier Integration* enhance *Operational Resilience* by strengthening *Risk Management Capability*. Based on this framework, the study hypothesizes that *Supply Chain Visibility* positively influences *Risk Management Capability* (H1), *Supplier Integration* positively influences *Risk Management Capability* (H2), *Risk Management Capability* positively influences *Operational Resilience* (H3), and *Risk Management Capability* mediates the relationships between *Supply Chain Visibility* (H4) and *Supplier Integration* (H5) with *Operational Resilience*.

3. RESEARCH METHODS

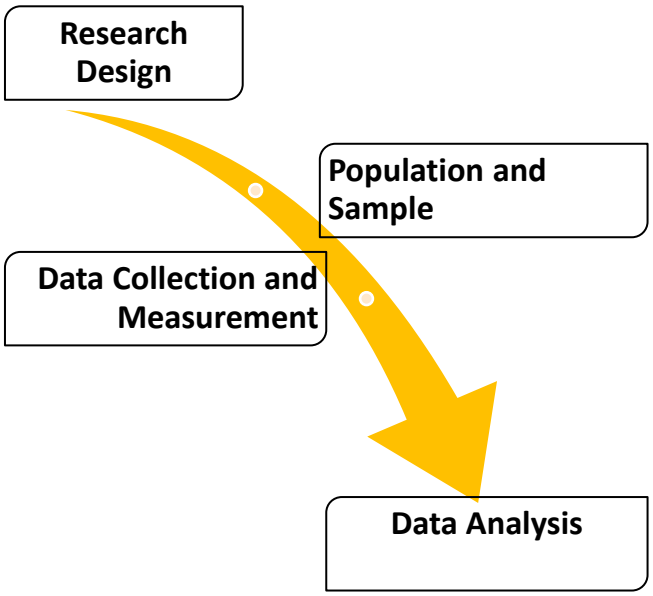


Figure 1. The structure of the research flow diagram.

Research Design

This study employs a quantitative approach with an explanatory research design to examine the relationships among *Supply Chain Visibility*, *Supplier Integration*, *Risk Management Capability*, and *Operational Resilience* in small manufacturing enterprises. The explanatory research approach is selected because the study aims to test the influence of independent variables on dependent variables and to explain the mechanism through which risk management capability contributes to operational resilience. The research model is developed based on previous theoretical perspectives and empirical findings regarding supply chain capabilities and organizational resilience. This approach enables the researcher to measure the relationships among variables objectively through numerical data analysis and to evaluate both direct and indirect effects within the proposed conceptual framework.

Population and Sample

The population of this study consists of small manufacturing enterprises that maintain relationships with raw material suppliers and conduct production activities as part of their business operations. The respondents are selected from business owners, managers, or individuals responsible for procurement, production planning, inventory management, and supplier coordination because they possess relevant knowledge regarding supply chain activities. The sampling technique used is purposive sampling, where respondents are selected based on specific criteria aligned with the research objectives. The criteria include enterprises

that have operational experience, actively interact with suppliers, and have experienced or managed supply chain-related challenges. This sampling approach ensures that the collected data represent respondents who understand the implementation of supply chain practices and risk management processes within small manufacturing enterprises.

Data Collection and Measurement

Data collection is conducted through a structured questionnaire using a five-point Likert scale ranging from strongly disagree to strongly agree. The questionnaire items are developed to measure four main research constructs: *Supply Chain Visibility*, *Supplier Integration*, *Risk Management Capability*, and *Operational Resilience*. *Supply Chain Visibility* is measured through indicators related to information availability, transparency, and access to supply chain conditions. *Supplier Integration* is assessed through communication, collaboration, and information-sharing activities with suppliers. *Risk Management Capability* is measured based on the ability to identify, evaluate, mitigate, and respond to supply chain risks. Meanwhile, *Operational Resilience* is evaluated through the ability to maintain, adapt, and recover operational activities during disruptions. The collected responses are used to empirically evaluate the proposed research model.

Data Analysis

Data analysis is performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the relationships among the research variables and test the proposed conceptual model. The analysis process begins with instrument evaluation through validity and reliability testing to ensure that all measurement indicators accurately represent the research constructs. The *Outer Model Evaluation* is conducted by examining convergent validity, discriminant validity, and construct reliability. Furthermore, the *Inner Model Evaluation* is performed to assess the structural relationships among variables through path coefficients, coefficient of determination (R^2), and significance testing. The study also examines direct and indirect effects to determine the influence of each variable. Mediation analysis is conducted to evaluate the role of *Risk Management Capability* in explaining the relationship between *Supply Chain Visibility*, *Supplier Integration*, and *Operational Resilience*.

4. RESULTS AND DISCUSSION

Results

This study involved 200 respondents from small manufacturing enterprises involved in production activities and maintaining relationships with raw material suppliers. The respondent characteristics indicate that most participants were business owners or operational managers who had direct involvement in procurement, production planning, inventory control, and supplier coordination. The businesses represented various manufacturing sectors with different operational scales and supply chain structures. The findings show that most enterprises rely on several key suppliers for raw materials, while supplier relationships are mainly maintained through direct communication and repeated transactions. The descriptive analysis indicates that respondents generally perceive the implementation of *Supply Chain Visibility*, *Supplier Integration*, *Risk Management Capability*, and *Operational Resilience* at a moderate to high level. These findings suggest that small manufacturing enterprises have begun to develop supply chain capabilities to manage uncertainty, although improvements are still required, particularly in information integration and systematic risk management practices.

Table 1. Respondent Characteristics and Business Profiles.

Characteristics	Category	Frequency	Percentage (%)
Business Position	Owner	85	42.5
	Operational Manager	75	37.5
	Production Supervisor	40	20.0
Business Experience	< 5 years	45	22.5
	5–10 years	95	47.5
	> 10 years	60	30.0
Number of Employees	< 10 employees	80	40.0
	10–50 employees	90	45.0
	> 50 employees	30	15.0

The characteristics of production activities indicate that respondents operate businesses with different production capacities and supply chain structures. Most enterprises depend on external suppliers for raw materials, making supplier relationships an important element in maintaining production continuity. The evaluation of supply chain practices shows that enterprises have implemented information-sharing mechanisms, supplier coordination activities, and basic risk management practices. However, some enterprises still experience limitations in integrating supply chain information and developing structured risk response strategies.

Table 2. Characteristics of Production Activities and Supply Chain Relationships.

Indicator	Category	Frequency	Percentage (%)
Supplier Relationship Duration	< 3 years	55	27.5
	3–5 years	85	42.5
	> 5 years	60	30.0
Number of Main Suppliers	1–2 suppliers	70	35.0
	3–5 suppliers	100	50.0
	> 5 suppliers	30	15.0
Supply Chain Information Sharing	Low	35	17.5
	Moderate	110	55.0
	High	55	27.5

The measurement model evaluation confirms that all research constructs meet the required criteria for validity and reliability testing. The *Outer Model Evaluation* shows that the indicators have acceptable convergent validity based on factor loadings and Average Variance Extracted (AVE), while discriminant validity confirms that each construct represents a distinct concept. Furthermore, construct reliability testing demonstrates satisfactory values through Composite Reliability and Cronbach's Alpha, indicating that the measurement instruments are consistent.

Table 3. Outer Model Evaluation.

Construct	Cronbach's Alpha	Composite Reliability	AVE	Result
Supply Chain Visibility	0.865	0.908	0.663	Valid and Reliable
Supplier Integration	0.842	0.891	0.624	Valid and Reliable
Risk Management Capability	0.878	0.917	0.689	Valid and Reliable
Operational Resilience	0.856	0.901	0.646	Valid and Reliable

The *Inner Model Evaluation* indicates that the proposed model has adequate explanatory capability. The coefficient of determination (R^2) demonstrates the contribution of *Supply Chain Visibility*, *Supplier Integration*, and *Risk Management Capability* in explaining variations in *Operational Resilience*. Hypothesis testing through PLS-SEM reveals significant relationships among the variables, confirming the proposed structural model and supporting the importance of supply chain capabilities in strengthening operational resilience.

Table 4. Structural Model Evaluation and Hypothesis Testing.

Hypothesis	Relationship	Path Coefficient (β)	t-value	p-value	Result
H1	SCV → RMC	0.342	5.214	<0.001	Supported
H2	SI → RMC	0.389	6.105	<0.001	Supported
H3	RMC → OR	0.456	7.342	<0.001	Supported
H4	SCV → RMC → OR	0.156	3.876	<0.001	Supported
H5	SI → RMC → OR	0.177	4.215	<0.001	Supported

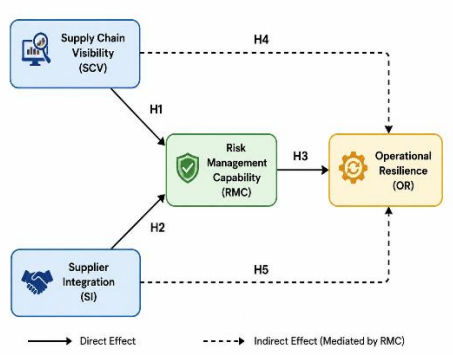


Figure 2. Conceptual Model and Structural Relationship.

Discussion

The findings demonstrate that *Supply Chain Visibility* has a positive influence on *Risk Management Capability*, indicating that access to accurate and timely supply chain information enables small manufacturing enterprises to identify potential risks and develop appropriate responses. In small manufacturing contexts, visibility allows enterprises to monitor supplier conditions, material availability, and operational changes more effectively. These capabilities are important because small firms generally have limited resources and fewer alternatives when disruptions occur. Therefore, improving supply chain visibility can help enterprises move from reactive responses toward more proactive risk management practices.

The results also show that *Supplier Integration* significantly contributes to *Risk Management Capability* and *Operational Resilience*. Strong relationships with suppliers through communication, coordination, and information sharing enable enterprises to respond more effectively to supply disruptions. Supplier collaboration becomes an important mechanism because limited internal resources require greater dependence on external partnerships. Through stronger integration, enterprises can improve coordination, reduce uncertainty, and develop faster responses when facing supply chain challenges.

The analysis further confirms that *Risk Management Capability* plays a significant mediating role between supply chain capabilities and *Operational Resilience*. This finding indicates that visibility and supplier integration do not automatically create resilience but require effective risk management processes to transform information and relationships into adaptive actions. The role of risk management capability demonstrates that enterprises need structured approaches to identify risks, allocate resources, and develop recovery strategies. Therefore, strengthening digital information access, supplier collaboration, and risk

management practices can improve the ability of small manufacturing enterprises to sustain operations and recover from supply chain disruptions.

5. CONCLUSIONS AND SUGGESTIONS

Conclusion

This study concludes that *Supply Chain Visibility*, *Supplier Integration*, and *Risk Management Capability* are important factors in strengthening *Operational Resilience* among small manufacturing enterprises. The findings demonstrate that improved visibility of supply chain information enables enterprises to identify changes, monitor potential disruptions, and support more effective decision-making. Furthermore, stronger supplier integration enhances communication, coordination, and collaborative responses when facing supply-related challenges. These capabilities allow small manufacturing enterprises to improve flexibility and maintain operational continuity despite uncertain supply chain conditions.

The study also confirms that *Risk Management Capability* plays a crucial mediating role in transforming supply chain capabilities into operational resilience. The ability to identify, evaluate, mitigate, and respond to risks enables enterprises to utilize supply chain information and supplier relationships more effectively. Therefore, the integration of information visibility, supplier collaboration, and risk management practices provides a strategic foundation for small manufacturing enterprises to withstand disruptions, recover operational activities, and achieve sustainable competitiveness in dynamic business environments.

Recommendations

Based on the findings, small manufacturing enterprises are recommended to strengthen supply chain information management systems to improve visibility regarding supplier conditions, inventory availability, demand changes, and operational risks. Enterprises should also develop stronger collaborative relationships with suppliers through continuous communication, information sharing, and joint problem-solving activities. These practices can improve supply chain flexibility and responsiveness while reducing vulnerability caused by supply uncertainty and external disruptions.

Future research is recommended to expand the proposed model by incorporating additional factors that may influence operational resilience, such as digital transformation capability, supply chain agility, innovation capability, and technology adoption. Further studies may also examine different industrial sectors, larger sample sizes, or comparative research between small and large enterprises to provide broader insights into supply chain resilience

development. Such extensions can contribute to a deeper understanding of how organizations build adaptive capabilities in increasingly uncertain supply chain environments.

DAFTAR REFERENSI

Atieh, A. A. (2025). The role of strategic resilience and data-driven culture in enhancing supply chain risk management: A resource orchestration perspective. *Paper Asia, 41*(3), 258–268. https://doi.org/10.59953/paperasia.v41i3b.509

Azman, A. B., Majid, M. A. A., & Zulkifly, M. I. (2024). A systematic literature review on the impact of crises on the food supply chain of micro-food businesses. In *Sustainable Development, Humanities, and Social Sciences for Society 5.0* (pp. 335–359). IGI Global. https://doi.org/10.4018/979-8-3693-7989-9.ch017

Barhmi, A. (2023). Risk management, robustness and resilience: Mechanisms for stabilizing and improving agility performance. *Production, 33*, Article e20220119. https://doi.org/10.1590/0103-6513.20220119

Cristofaro, M., & Lovallo, D. (2022). From framework to theory: An evolutionary view of dynamic capabilities and their microfoundations. *Journal of Management & Organization, 28*(3), 429–450. https://doi.org/10.1017/jmo.2022.46

Deshpande, S., Hudnurkar, M., & Rathod, U. (2023). An exploratory study into manufacturing supply chain vulnerability and its drivers. *Benchmarking: An International Journal, 30*(1), 23–49. https://doi.org/10.1108/BIJ-04-2021-0233

Duong, N. H., & Ha, Q. (2021). The links between supply chain risk management practices, supply chain integration and supply chain performance in Southern Vietnam: A moderation effect of supply chain social sustainability. *Cogent Business & Management, 8*(1), Article 1999556. https://doi.org/10.1080/23311975.2021.1999556

El Baz, J., & Ruel, S. (2021). Can supply chain risk management practices mitigate the disruption impacts on supply chains' resilience and robustness? Evidence from an empirical survey in a COVID-19 outbreak era. *International Journal of Production Economics, 233*, Article 107972. https://doi.org/10.1016/j.ijpe.2020.107972

Elimbi Moudio, M. P., Bolin, R., Carpenter, A., Reese, S. B., Shehabi, A., & Rao, P. (2022). Characterizing manufacturing sector disruptions with targeted mitigation strategies. *Environmental Research: Infrastructure and Sustainability, 2*(4), Article 045004. https://doi.org/10.1088/2634-4505/ac9c8c

Fatoki, J. G., & Mora-Monge, C. A. (2025). Reconceptualizing supply chain risk management capabilities: A theoretical framework and empirical validation. *Supply Chain Management, 1–22*. https://doi.org/10.1108/SCM-05-2025-0473

Huang, Y. F., Phan, V. D. V., & Do, M. H. (2023). The impacts of supply chain capabilities, visibility, resilience on supply chain performance and firm performance. *Administrative Sciences, 13*(10), Article 225. https://doi.org/10.3390/admsci13100225

Kalaiarasan, R., Agrawal, T. K., Olhager, J., Wiktorsson, M., & Hauge, J. B. (2023). Supply chain visibility for improving inbound logistics: A design science approach. *International Journal of Production Research, 61*(15), 5228–5243. https://doi.org/10.1080/00207543.2022.2099321

Lambert, D. M., & Knemeyer, M. (2007). Measuring performance: The supply chain management perspective. In *Business Performance Measurement: Unifying Theories and Integrating Practice* (2nd ed., pp. 82–112). Cambridge University Press. https://doi.org/10.1017/CBO9780511805097.006

Liu, H., Xu, X., Cheng, T. C. E., & Yu, Y. (2024). Building resilience or maintaining robustness: Insights from relational view and information processing perspective. *Transportation Research Part E: Logistics and Transportation Review*, *188*, Article 103609. https://doi.org/10.1016/j.tre.2024.103609

Mahmud, P., Paul, S. K., Azeem, A., & Chowdhury, P. (2021). Evaluating supply chain collaboration barriers in small and medium-sized enterprises. *Sustainability*, *13*(13), Article 7449. https://doi.org/10.3390/su13137449

Mărincaş, D. A. (2008). Information system for the supply chain management. *Amfiteatru Economic*, *10*(24), 236–253.

Messina, D., Soares, A. L., Barros, A. C., & Zimmermann, R. (2023). How visible is your supply chain? A model for supply chain visibility assessment. *Supply Chain Forum: An International Journal*, *24*(4), 462–474. https://doi.org/10.1080/16258312.2022.2079955

Shekarian, M., & Mellat Parast, M. (2021). An integrative approach to supply chain disruption risk and resilience management: A literature review. *International Journal of Logistics Research and Applications*, *24*(5), 427–455. https://doi.org/10.1080/13675567.2020.1763935

Sunmola, F. T., & Apeji, U. D. (2024). Modelling supply chain visibility: A framework with considerations for manufacturing and business. *Journal of Manufacturing Technology Management*, *35*(7), 1354–1374. https://doi.org/10.1108/JMTM-09-2023-0375

ur Rehman, A., Shakeel Sadiq Jajja, M., & Farooq, S. (2022). Manufacturing planning and control driven supply chain risk management: A dynamic capability perspective. *Transportation Research Part E: Logistics and Transportation Review*, *167*, Article 102933. https://doi.org/10.1016/j.tre.2022.102933

Yang, J., Xie, H., Liu, M., & Wang, J. (2024). Leveraging relational capital with ambidexterity in building supply chain resilience. *International Journal of Logistics Research and Applications*, *27*(11), 2190–2207. https://doi.org/10.1080/13675567.2023.2244890

Yang, J., Xie, H., Yu, G., & Liu, M. (2021). Antecedents and consequences of supply chain risk management capabilities: An investigation in the post-coronavirus crisis. *International Journal of Production Research*, *59*(5), 1573–1585. https://doi.org/10.1080/00207543.2020.1856958

Zhou, Z., & Hosseini, S. (2023). Evaluating supply chain resilience: A resilience capacity perspective. *International Journal of Logistics Systems and Management*, *46*(3), 333–355. https://doi.org/10.1504/IJLSM.2023.134798

Özkanlısoy, Ö., & Bulutlar, F. (2023). Measuring supply chain visibility in disruptive technology era: Scale development and validation. *International Journal of Integrated Supply Management*, *16*(4), 385–418. https://doi.org/10.1504/IJISM.2023.133864

Öztürk, N. (2024). Dynamic capabilities theory for sustainable development. In *Integrating Organizational Theories With Sustainable Development* (pp. 171–191). IGI Global. https://doi.org/10.4018/979-8-3693-8337-7.ch009