International Journal of Computer Information Systems and Industrial Management Applications
ISSN 2150-7988 Volume 18(22s) 2026 pp. 1139-1163
https://doi.org/10.70917/ijcisim-2026-5506
Article

Logistics Risk Management as a Mechanism for Ensuring Supply Chain Continuity and Enhancing Operational Capabilities in Saudi Food Manufacturing Companies

Eng.Hassan Omar Hassan Badkook

Omar Kassem Alesayi Marketing Company Ltd. (OKAM) , HSA Group
hassan.badkook1981@gmail.com

Abstract: Background: This study investigates the relationships between Logistics Risk Management (LRM), Supply Chain Continuity (SCC), and Operational Capabilities (OC) among food manufacturing companies in Saudi Arabia, addressing the limited empirical understanding of how logistics risk management contributes to operational capabilities through supply chain continuity. **Methods:** Drawing on Dynamic Capabilities Theory and Organizational Information Processing Theory, empirical data were collected through a survey of 275 respondents from Saudi food manufacturing companies. The proposed conceptual model was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) through Smart PLS. **Results:** The findings support all four proposed hypotheses. Logistics Risk Management has a strong positive effect on Supply Chain Continuity ($\beta = 0.74$, $p < 0.001$), while Supply Chain Continuity positively affects Operational Capabilities ($\beta = 0.46$, $p < 0.001$). Logistics Risk Management also has a significant direct effect on Operational Capabilities ($\beta = 0.31$, $p < 0.001$). Furthermore, Supply Chain Continuity partially mediates the relationship between Logistics Risk Management and Operational Capabilities ($\beta = 0.28$, $p < 0.001$). Among the dimensions of LRM, Risk Mitigation demonstrated the strongest contribution, followed by Risk Control, Risk Assessment, and Risk Identification. **Conclusions:** The study demonstrates that Logistics Risk Management represents an important organizational capability that strengthens Operational Capabilities both directly and indirectly by maintaining the continuity of critical supply chain activities. The findings extend existing research by identifying Supply Chain Continuity as a distinct mediating mechanism and provide theoretical and practical insights for improving operational capabilities and managing logistics disruptions within Saudi food manufacturing companies.
Keywords: Logistics Risk Management; Supply Chain Continuity; Operational Capabilities; Saudi Food Manufacturing.

1. Introduction:

Supply chains have become increasingly exposed to disruptions arising from natural disasters, geopolitical tensions, economic instability, pandemics, technology failures and more unexpected events. Impacts of these disruptions can ripple through the interdependent nature of the supply chain environment, as disruptions at one link can cause effects throughout the network at other organizations and events. As a result, organizational continuity and performance can be compromised in the event of a chain disruption, resulting in production delays, higher operating costs, shortage and problems to sustain normal business level (Kleindorfer & Saad, 2005; Craighead et al., 2007; Ivanov, 2020). As supply chains become more complex and interconnected, therefore, risk management, rather than reacting operational activity, becomes a critical management concern to identify and mitigate risks in the supply chains. New research also highlights the need for supply chain resilience and robustness as an important organizational capability to execute operations with changing demands of various firms in time of unexpected shocks in the operation of the supply chain (Shekarabi et al., 2025; Paul & Saha, 2025).

In this context, Supply Chain Risk Management (SCRM) has become an imminent strategic way of identifying, assessment, mitigation and recovery of risks, which can disrupt the movement of material, information and products along the supply chain. Effective risk management can help the businesses recognize possible risks for disruption and take measures before the risks become a disaster to the enterprise (Jüttner, 2005; Aqlan & Lam, 2015). As a result, the management of risk is becoming more widely considered as a capability that can help firms lessen the risk of disruption and improve their capacity to sustain the activities of their supply chains. This relationship has been supported by recent empirical evidence, which suggests a positive connection between risk management practices and supply chain resiliency, as well as the early identification of risks and a quick response to disruptions (Munir et al., 2024). Likewise, the latest research from manufacturing companies shows that SCRM practices positively impact supply chain resilience as well as robustness, albeit to varying degrees in different contexts (Sahab & Oulfarsi, 2026).

An effective risk management benefits are the capacity of the chain of value to maintain continuity in the event of disturbances. While supply chain resilience typically focuses on the ability to absorb shocks, deal with their impact, and evolve to emerging scenarios, supply chain robustness is more about maintaining desired performance when facing disruptions (Christopher and Peck, 2004; Simchi-Levi et al., 2018). Such capabilities are essential as there are possibilities of disasters that cannot be avoided; however, the ability to carry on the essential functions with minimum loss of time and intensity of disruption is essential. Research based on empirical studies has evidenced that resilience has been linked to the performance of an organization's operational and supply chain processes, and that it can be a channel for positive risk management outcomes (Huo et al., 2020; Jidda Jidda et al., 2021). Specifically, Jidda Jidda et al (2025) concluded that there is a partial mediated effect of resilience between the integration of enterprise risk management and the performance of the supply chain. They concluded that supply chain performance is achieved through developing a resilience capacity that is dictated by enterprise risk management integration.

Effective risk management can deliver one of the most significant benefits of resilience to the supply chain that it has to continue when things go wrong. Supply chain resilience can be understood as the ability of a supply chain to endure disruption, bounce back from the effects and react to changing conditions, while robustness focuses on the ability of the supply chain to continue to perform its desired functions with disruptions (Christopher & Peck, 2004; Simchi-Levi et al., 2018). These skills are especially vital because it is not always possible to avoid disruption; but it is necessary to establish systems that enable vital business operations to continue as much as possible while reducing the length and impact of interruptions Likewise, studies on manufacturing supply chains have shown that supply chains which are resistant can have positive impacts on how resilience transforms organizational and technological characteristics into increased innovativeness and competitiveness (Tian et al., 2024). Further evidence also suggests that there may be a relationship between risk-management integration and the performance of supply chains mediated by the resilience capability to manage risk (Jidda Jidda et al., 2025), which further strengthens the argument that the impact of risk management on organizations can be realized through intermediate mechanisms of capability building.

Although significant strides have been made, these have left so far, the literature rather inconsistent in how logistics risk management gets translated into the continuity of the supply chain and then to the operating capabilities. A vast majority of the literature studied so far focuses on the direct link between the process of supply chain risk management and resilience, robustness and/or firm performance (El Baz & Ruel, 2021; Kaluku et al., 2025; Sahab & Oulfarsi, 2026). In addition, other studies have focused on specific chains of supply risk factors, including supplier and customer concentration, digitalization risks, and supply chain structure (Ahsan et al., 2023; Jiang et al., 2023; Zhao et al., 2023). While these studies greatly contribute to knowledge about what a supply chain risk is, there are less studies that explicitly conceptualize continuity as the process by which logistics risk management improves the capability of the business firm. Furthermore, recent research still demands more empirical research of how the process of risk-management practice can change an organization to a resilient one and produce performance-related outcomes.

The significance of this gap is evident in the Saudi food manufacturing industry, in which the continuity of activities in the area of sourcing, production, transportation and distribution plays a vital role. Any delay in supply, delivery, storage or information systems can directly affect operations and market supply. Furthermore, most of the previous studies have studied these relations at national levels across various countries, leaving a gap in understanding them in the context of Saudi Arabia. Hence, the current study analyzes the logistics risk management situation in the Saudi food manufacturing companies for improving the continuity and operational capability of the supply chain, and tests supply chain continuity as a mediator between logistics risk management and the Saudi food companies operating capability.

This study is important not only because of its results on a better outcome of the operation but also because of its findings about how the outcome is better. This study explained the importance of supply chain continuity in identifying how the use of risk management practices can be linked to effective operational capabilities, which would ultimately help the Saudi food manufacturing companies to respond well to disruptions and enhance their operational continuity.

2. Literature Review

2.1. Theoretical Background

2.1.1 .Dynamic Capabilities Theory

Dynamic capabilities theory is a suitable theoretical approach for explaining how companies cope with changing, uncertain, and disruptive business environments. Developed by Teece et al. (1997) based on the logic of resource theory, means that having resources is not enough to create a viable competitive edge. Because, the companies must have the capability to redesign their resources and capabilities according to the changes in environment. In this context, Dynamic Capabilities are the capabilities of an organization to integrate, reconfigure and develop its resources to adjust to external changes and threats.

In a supply chain, the concept begins to matter quite a bit when supply, transportation, demand, price and technology is constantly changing. Risk detection and their handling along with the restructuring of logistical processes in accordance with the new conditions are thus an essential part of the sustainability of a company. According to Winter (2003), dynamic capabilities refer to the capacity of an organization to modify its routine behavior when necessary and when conditions vary. Teece (2007) points out that dynamic capabilities enable organizations to sense, respond and reconfigure their activities when there are shifts in the environment.

Logistics risk management on this perspective would be considered as a dynamic capability, which helps organizations to manage logistics risks from all sources that pose threats to their transportation, warehousing, inventory and distribution operations. If a company has a solid risk identification, assessment, mitigation, and monitoring system in place, it will be able to better reroute its suppliers and logistics operations when a new risk arises. This perspective has been supported by the literature and is based on the understanding that SCRM is an ongoing competence that needs to be learned, adapted and reconfigured in terms of resources and processes (Beske, 2012; Fan & Stevenson, 2018).

In considering this study model, there is also a relationship between dynamic capabilities and operational capabilities. There is a distinction between dynamic capabilities that aid an organization to change and adapt and capabilities which enable it to carry out its current activities efficiently, that is, the operational capabilities. Helfat and Winter (2011) suggest that the dynamic and operational capacities are related, with dynamic capabilities enabling organizations to change their operational capabilities in response to changing conditions or events. Logistics risk management can, therefore, be interpreted as a capacity that assists a company in reallocating resources and processes and the capacity's outcome as a company's ability to preserve the continuity of its supply chain and improving its operating capacities.

Applied studies in the field of supply chains support this logic. Brusset and Teller (2017) found that as operations' capabilities increase, especially in integrating and resisting internal change, so do the chances for the supply chain to become resilient; however, the link between risk and operational capability is as much about the capacity of managers to develop the necessary resources and processes. Barhmi (2023) also demonstrated that supply chain risk management can be treated as a dynamic capability, and that reconfiguring operational capabilities related to resilience and agility helps companies improve their performance during times of disruption.

Implementing that, dynamic capability theory offers a sound foundation for the interpretation of the model which are proposed in this study. It assumes that companies that build capacity with respect to logistical risk can build the capacity to deal with logistical disruptions, to preserve the flow of supplies, and then proceed to convert the capacity to more effective operational capacity.

2.1.2. Organizational Information Processing Theory

Organizational Information Processing Theory (OIPT) provides a complementary perspective for understanding logistics risk management, especially since risk management relies heavily on the availability of information related to suppliers, transportation, inventory, demand, and operations. The theory assumes that uncertainty is a characteristic that exists in organizations in a continuum, and that how the organizations are able to deal with uncertainty is related to their ability to gather, process, exchange and use information in their tasks of making appropriate decisions (Galbraith, 1974; Tushman and Nadler, 1978).

As businesses and various functions become more interconnected, it is vital that information is processed in a supply chain. Information inaccuracies or delays on materials availability, arrival of shipments etc. can contribute to the wrong operations being undertaken, whereas the timely and accurate provision of information can identify risks before they increase to a problem. Bode et al. (2011) demonstrated that the response to supply chain disruption depends on how a business is able to process risk information and respond appropriately.

From this perspective, logistics risk management requires a continuous system for collecting information about risk sources, analysis of the probabilities and impacts, and then, with the gathered information, to establish measures that allow for the minimization or control of the risk. Three of these four dimensions of logistics risk management relate directly to the theory of organizational information processing: information acquisition is required to identify risks, the analysis is required to evaluate risks, and the use of analysis to inform decision-making is required to mitigate risks, while the continuous flow of information and monitoring changes is required to control risks.

Hazen and Sankar (2015) found that optimizing processes would be a key determinant in matching the information processing capabilities with information needs of an organization. The most recent available information shows that there has been a growing reliance on supply chain (SC) visibility, information sharing, and constant analysis in the field of Supply Chain Risk Management. Moreover, the management of risk is not simply dependent of the internal risk information but equally demands the sharing of this information with their suppliers, transportation providers and their customers to allow a network-wide view of the risk, not simply a corporate one.

Thus, OIPT can be understood as a tool to understand how logistics risk management can aid in facilitating and sustaining the supply chain. Companies that can obtain accurate risk information and take action timely, will have the better chance to take proactive steps to ameliorate disruptions to logistical operations. This theory supports the dynamic capabilities theory by explaining the informational component of a company's risk detection and response.

2.2. Logistics Risk Management

Logistics risk management refers to the set of organized practices in which companies take part, aimed at identifying, assessing, controlling and managing possible logistics related risks during transportation, warehousing, inventory, distribution and information handling in the company (Choi et al., 2016; Arivumalar & Mohan, 2023; Deselnicu et al., 2023). Logistics risk management is a part of SC risk management, but concentrated specifically on logistics activities risks regarding the flow of materials, products and information through SC activities. Research in the literature indicates that the risks in logistics can be decomposed into the risks related to transportation, warehousing and inventory, and that a disruption in any of these domains can have a direct effect on company performance and business continuity (Maleki Vishkaei et al., 2024; Guntuka et al., 2024).

From the relevant literature, this study uses four dimensions to measure the logistics risk management as multi-dimensional-pair, those dimensions are risk identification, risk assessment, risk mitigation and risk control. In the past these four processes have been used to score supply chain risk management—all of which measure different aspects of the risk management process.

2.2.1 .Risk Identification

Risk identification is the first stage in the logistics risk management process, which involves the skills a company has to identify potential sources of risk before they develop into disrupting events. Those risks can be supplier delays, transportation issues, material shortages, warehouse failures, distribution failures, and lack of information and/or poor sight of the supply chain in the logistics environment (Sahab & Oulfarsi, 2026).

The key factor to consider here is that it provides the company ample time to act on the risks being identified, and minimizes the risk of an area problem spreading to become a major disruption. It has manifested in the literature that the effective management of risk starts with the capacity of company to collect data on risk sources, to identify early warning indicators and to keep scrutinizing risk sources for new risks all the time (Jüttner, 2005; Tang & Musa, 2011). Data on short and long-term risks are also gathered during the risk identification process as well as building early warning indicators. It is especially crucial in the food sector as food products are sensitive about the time, temperature, raw materials and continuity of transportation and food storage. Knowing how to detect logistical risks early, therefore, may lead companies to take steps to avoid them affecting production or distribution.

2.2.2 Risk Assessment

Once aware of their risks a company must analyze the likelihood of them happening and the extent of their effect if they do happen. Risk assessment is the method of study and categorization of risks based on likelihood of occurrence and impact of the risks. This enables management to be aware of the risks that are worthy of priority management (LEI et al., 2026).

This process entails identifying the origins of risks, evaluating the likelihood of their happening, calculating their chances to affect the actions of the business, working out the seriousness and priority of that risk. This allows companies to allocate their resources to the most critical risks instead of treating all risks the same. The literature confirms that risk assessment is a fundamental element of risk management because it links risk recognition with the decision-making process regarding how to address it (Aqlan & Lam, 2015; Fan & Stevenson, 2018). In a logistical context, risk assessment can help companies determine the impact of a disruption to a specific resource, transportation method, distribution center, or inventory level on business continuity. Thus, the role of assessment is not limited to describing risks, but also helps transform related information into actionable operational decisions.

2.2.3 Risk Mitigation

Risk mitigation is the things a company does to minimize the exposure to risk or to lessen its impact if it happens. In logistics, it means varying suppliers, exploring alternative means of transport, maintaining buffer stocks and working from reserves, enhancing logistics operation flexibility and working with partners (Sahab & Oulfarsi 2026).

The literature indicates that mitigation strategies help companies reduce their exposure to disruptions by providing alternatives and reducing reliance on a single source of risk. The continuity of operations can also be achieved because of contingency plans and redundancy in the supply chain in case of a breakdown in one source or one route (Norrman & Jansson, 2004; Kırılmaz & Erol, 2017). Within the food sector, risk mitigation is especially critical because of the speed of the effects of disruptions on the spectrum from transport and storage to production and distribution. So having other options for logistics, having a stock, having plans of action, they can limit down-time and ensure that a product flows.

2.2.4 .Risk Control/Monitoring

Risk control is a continuous process of risk monitoring, evaluating the effectiveness of risk mitigation and modifying them accordingly. Risk management does not end once a risk is identified or a mitigation measure is implemented (Sahab & Oulfarsi, 2026). The impact and frequency of a risk may vary over time, and new risks can be identified as a result of changing operating circumstances

Clear procedures, performance indicators, continuous monitoring and feedback mechanisms to enable risk management plans to be updated are necessary to enable effective control. Manuj and Mentzer (2008) emphasized the need for 'information management on a continuous basis and continuous monitoring for handling risks' in supply chain. Leveraged Literature presents that control plays a vital role in minimizing the risk probability and impact through the continuous monitoring of performance and preparedness. Examples of control areas in the logistics environment include supplier performance, delivery schedules, inventory level management, carrier performance, shipment tracking, quality of information, and effectiveness of contingency plans. Therefore, continuous control will help to identify deviations at an early stage, trigger action to bring procedures back on track and avoid disruptions of supply chain continuity.

Accordingly, the four dimensions mentioned above are viewed as interconnected components of logistics risk management. Risk identification provides knowledge of risks, risk assessment prioritizes them, mitigation reduces their likelihood or impact, and control ensures the continued effectiveness of these measures. Therefore, this study will treat Logistics Risk Management as a higher-order structure comprised of these four dimensions.

2.3 .Logistics Risk Management and Supply Chain Continuity

Supply chain continuity is the capacity to keep activities, materials, information and products moving through the value chain without interruptions that substantially impact the performance of the business. Unlike resilience, continuity is primarily about keeping key operations and flows going during disruption, while resilience concerns a range of capability to respond, recover, adapt (Nel, 2024).

The literature indicates that risk management is one of the most important strategies that companies can use to minimize the potential of their supply chains becoming disrupted, and keep them running. By identifying the source of the risk, understanding what impact it can have and rendering an adequate response, the firms are better equipped to mitigate risk from becoming an operational disruption. Previous studies have shown that supply chain risk management practices are linked to firms' capacity to mitigate the impacts of a disruption, and therefore increase the level of supply chain resilience. Previous studies have shown that supply chain risk management practices are associated with firms' ability to reduce the effects of disruptions and strengthen supply chain resilience (El Baz & Ruel, 2021; Munir et al., 2024).

Risk management from the dynamic capability point of view allows a firm to adjust to change and re-configure resources and processes prior to and during the disruption. Risk management helps companies to prepare for potentials rather than react to real events, by recognizing the vulnerabilities and setting up alternatives for sourcing, transportation, inventory and distribution. Therefore, risk management is a preventive measure, enabling the continuity of operations. This relationship is also stressed by Organizational Information Processing Theory which is grounded in the recognition of the importance of information speed of entry, analysis and utilization for operational continuity. The more likely it is to be able to identify delays, shortages and any potential transportation issues early on, the more the firm will be able to take other measures to avert disruption to operations.

Empirical studies suggest that risk management function in the supply chain (risk identification, assessment, mitigation and control) are related to the improvement of the capability of the organisation to respond to any disruption (El Baz & Ruel, 2021; Sahab & Oulfarsi, 2024). Recent evidence from the manufacturing sector also indicates that risk assessment, risk mitigation, and risk control play important roles in developing supply chain resilience, supporting the view that risk management should be understood as an integrated set of processes rather than as a single organizational practice (El Baz & Ruel, 2021).

Accordingly, a higher level of logistics risk management is expected to enhance firms' ability to maintain the flow of logistics activities when disruptions occur. Therefore, the following hypothesis is proposed:

H1: Logistics risk management has a significant positive effect on supply chain continuity.

2.4 .Supply Chain Continuity and Operational Capabilities

Supply chain continuity is not only about the prevention of disruption of activity but also the capacity of a company to remain in operations and to maintain effectiveness in its operations/process in the face of uncertainty. For manufacturing environments, continued supply chain flows rely on the organizational abilities of firms to continue the flow, react to disruptions, and adapt the configuration as needed (Guntuka & Carnovale, 2024; Chen et al., 2025). The operational capabilities depict a company's capacity to carry out fundamental functions while making them operational and efficient, to provide coordination of the resources, to meet market needs and to remain in pharmaceutical production/ logistics.

According to Dynamic Capabilities Theory, firms have to possess capabilities in addition to perform their activities in an efficient manner and has to have dynamic capabilities to change the way they conduct activities when the environment evolves (Helfat & Winter, 2011). In this context, supply chain continuity is a factor that contributes to maintain the continuity of a firm's operation, since the loss of materials, transport, or inventory could limit the capacity of this organization to resume and complete production and distribution processes even if it has a high degree of operational resources.

Previous studies support this relationship. Brusset and Teller (2017) found that capabilities such as integration and flexibility can strengthen a supply chain's ability to manage risks and achieve resilience. The literature (Jiang et al., 2024; Dza et al., 2024) also suggests the ability to enhance performance and operational capabilities, especially in situations of disruption, when the firms involved need to reorganize resources and activities in order to maintain the chain's operational continuity, by developing their capacity to be resilient in the chain. also suggests that strong SCR may lead to easier performance and operational capacity, especially in case of disruption which needs rearranging resources and activities to achieve the chain's operational continuity.

In addition, there is empirical evidence that indicates that the resilience and related capabilities along with the supply chains are positively related with operational performance in manufacturing companies recently. Jiang et al. (2024), for example, found that configurations of supply chain integration and analytics capabilities that support resilience were also associated with better economic and operational performance. Similarly, research on supply chain continuity emphasizes the importance of developing organizational capabilities that enable firms to maintain operations and respond effectively to disruptions (Chen et al., 2025).

Accordingly, supply chain continuity is not merely an outcome of risk management; it can also represent an important mechanism through which firms maintain and develop their operational capabilities. Therefore, the following hypothesis is proposed:

H2: Supply chain continuity has a significant positive effect on operational capabilities.

2.5 .Logistics Risk Management and Operational Capabilities

In addition to its expected effect on supply chain continuity, logistics risk management can directly influence operational capabilities. Companies that have well-defined risk identification, risk assessment, risk mitigation and risk control procedures are more likely to be able to predict operating issues ahead, allocate resources efficiently, react to changes in their operations and being informed about the probable impact of disruption. According to the evidences of SCRM received from manufacturing companies, it showed positive correlation with operational performance, because the better the supply chain risk management capabilities, the better the companies will respond to disruptive conditions within the supply chain and be able to operate efficiently (Rehman et al., 2022; Munir et al., 2020). Empirical findings also show that risk identification, risk assessment and risk mitigation practices have significant positive effect on the operational performance in manufacturing context recently (Abdulsalam et al., 2026).

The focus of risk management is reducing negative events, but, from a Dynamic Capabilities Theory perspective, is also about how a firm can configure its resources and processes in ways that can help it to be efficient in the operation of the business in the face of changing conditions. With this in mind, logistics risk management can help enhance the operational capabilities by improving readiness, flexibility, decision-making, and resource and process alternatives.

Empirical evidence supports this argument. Barhmi (2023) demonstrated that risk management capabilities could form part of the operational capability of resilience and agility, thereby assisting firms to perform well in the event of a disruption Similarly, Munir et al. (2024) found that risk management and analytics capabilities contribute to building supply chains that are better able to withstand disruptions.

In addition, studies that have investigated the functions of a supply chain's capabilities, risks and resilience have identified that the creation of operational capabilities (specifically those of integration and flexibility) has proven to correlate with the effectiveness of a supply chain in risk management and better outcomes (Brusset & Teller, 2017).

Accordingly, logistics risk management has been expected to have direct impacts on the operational capability by increasing the firms' capability of planning and responding appropriately, resource allocation and maintaining operational efficiency.

H3: Logistics risk management has a significant positive effect on operational capabilities.

2.6 .The Mediating Role of Supply Chain Continuity

Although logistics risk management can directly influence operational capabilities, its effect may not occur entirely through a direct pathway. Risk management can reduce the effects of disruptions, helping companies ensure the continuity of material, information and product flows. The continuity of this, in turn, can aid in maintaining operational activities and in strengthening the skills of the organizations (Jidda Jidda et al., 2025; Lei et al., 2026).

This perspective provides a deeper explanation of the relationships among the study variables. Rather than a risk management practice not just as a direct enabler for better operational capability, but also believes that part of the impact that the risk management has in the firm as a whole is done through the continuity of the chain of command. This argument is akin to the Dynamic Capabilities approach that focuses on how organizational practices can generate value by developing and redistributing capabilities, which helps them to adjust to new contexts (Teece, 2007).

Previous empirical studies support this mediation logic. Jidda Jidda et al. (2025) demonstrated that resilience capability mediates the relationship between enterprise risk management integration and supply chain performance. Similarly, Lei et al. (2026) found that supply chain resilience significantly mediates the relationship between supply chain risk management and firm performance in manufacturing firms. In addition, Dza et al. (2024) demonstrated that supply chain resilience mediates the relationship between supply chain management practices and operational performance in food and beverage companies.

This logic combined with reality from the food manufacturing industry, where maintaining operational continuity is considered a critical link between risk management processes and the operational results is of major concern. By correctly identifying the logistics risks, pinpointing these risks, and taking appropriate measures to diminish or manage them and to closely monitor their occurrence, company are better equipped to keep raw material and products inputs moving, minimize delays, and continue logistics production and delivery operations. Therefore, supply chain continuity can serve as an operation condition that help to transform risk management actions towards increased operational capacity (Dza et al., 2024; Jidda Jidda et al., 2025).

Therefore, the present study goes beyond examining the direct relationship between logistics risk management and operational capabilities and seeks to explain the mechanism through which this effect occurs. This mechanism is represented by supply chain continuity, which is expected to function as a link between logistics risk management and operational capabilities. Accordingly, the following hypothesis is proposed:

H4: Supply chain continuity mediates the relationship between logistics risk management and operational capabilities.

2.7. Conceptual Framework

The study builds on the theory and empirical literature and suggests that the interdependency of Logistics Risk Management (LRM), Operational Capabilities (OC) and Supply Chain Continuity (SCC) can be explained as follows: This is based on the Dynamic Capabilities perspective and sees LRM as an umbrella term that consists of risk identification, risk assessment, risk mitigation, and risk control (Jüttner, 2005; Fan & Stevenson, 2018; Munir et al., 2024).

The model suggests that LRM is effective in improving the Supply Chain Continuity if the firms can predict the risks, prevent disruptions, and ensure the continuity of material, information, or products in their supply chains. The findings are consistent with the previous studies regarding the impact of risk-management practices on firms' level of disruption management and enhancing their supply chain management capabilities (El Baz & Ruel, 2021; Munir et al., 2024). Accordingly, H1 proposes a positive relationship between LRM and SCC.

The framework also makes the assumption that Supply Chain Continuity is influencing Operational Capabilities as it is important for business to continue operations so the companies can coordinate their resources, meet market needs, coordinate logistics and distribution activities. It is in line with the operational and dynamic capabilities divide (Hauf & Winter, 2011) and has been found to be a connection between the capabilities of a supply chain and enhanced operational outcomes (Huo et al., 2024; Tian et al., 2024). Thus, H2 proposes a positive effect of SCC on OC. In addition, the model proposes a direct effect of LRM on Operational Capabilities (H3). Effective risk management can improve firms' ability to anticipate operational problems, allocate resources, develop alternative logistics arrangements, and respond effectively to uncertainty (Munir et al., 2020; Rehman et al., 2022).

Finally, the framework positions Supply Chain Continuity as a mediating mechanism between LRM and OC. The premise on which it rests is that managing risk helps improve their operational capacity in part by ensuring critical supply chain flows. It supports also past studies which have proved the mediation role of intermediary capabilities in the supply chain in implementing risk management and its impact on the performance measures (Dza et al., 2024; Jidda Jidda et al., 2025). Therefore, H4 proposes that SCC mediates the relationship between LRM and OC. Accordingly, the model examines three direct relationships (H1–H3) and one indirect relationship (H4), providing a framework for explaining not only whether logistics risk management improves operational capabilities, but also how this effect occurs through supply chain continuity.

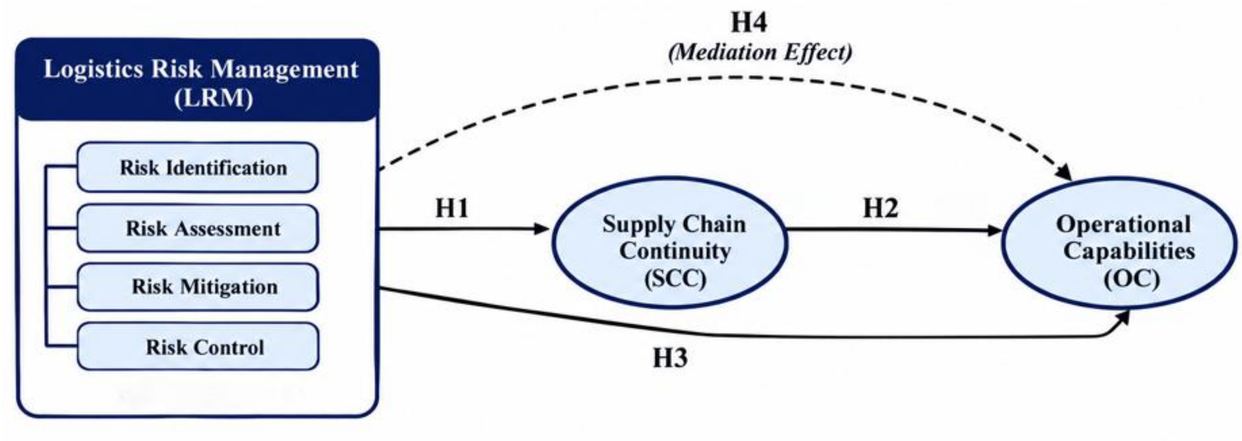

Figure 1. Conceptual Research Model

3. Methodology

3.1. Research Design

The current study employed a quantitative approach using a descriptive analytical methodology, as it sought to describe and analyze the relationship between study variables, and to investigate the proposed research hypotheses. In particular, the study focused on Logistics Risk Management to improve Operational Capabilities, an intermediary variable being Supply Chain Continuity.

In this regard, the concept of Logistics Risk Management was investigated as a multi-dimensional concept comprising four dimensions, namely Risk Identification, Risk Assessment, Risk Mitigation, and Risk Control. The study examined how these risk management activities influenced the related aspects of Saudi food manufacturing firms, which are related to Supply Chain Continuity and Operational Capabilities.

Structured questionnaires were used to gather primary data from the employees and managers of Saudi food manufacturing companies related to the area of supply chain management, logistics, procurement, warehousing, production and operations. Descriptive statistics of these data were then interpreted to determine the reliability and validity of the measurement instrument, the relationship between the study variables, the test of the direct effect of the study variables and the test of the mediating effect of Supply Chain Continuity.

The study also adopted a cross-sectional design because data was collected on respondents' perception of logistics risk management practices, continuity of supply chains and logistics & operational capabilities of organizations at one point in time.

3.2. Research Population and Sample

The study population comprised food manufacturing companies in the Kingdom of Saudi Arabia (KSA), a sector that plays an important role in food security, food production activities, food supply chain and food logistics operations in the Kingdom of Saudi Arabia (KSA). The study population consisted of employees and professionals working in relevant functional areas and having adequate knowledge and firsthand experience to assess the study variables: Logistics Risk Management, Supply Chain Continuity and Operational Capabilities.

A purposive sampling was employed for selecting the respondents, to assure the presence of participants with relevant involvement and experiences in the supply chain, logistics, procurement, operations, production, warehousing, distribution, risk management and quality management activities. Finally, 275 respondents from the food manufacturing companies in the Kingdom of Saudi Arabia were included in a sample.

The demographic and organizational features of the respondents encompassed were gender, age, highest educational qualification, job position currently held, functional department, years of service and years of service in the current organization. The organizational information also captured the company size, main food production category and the existence of any procedures or policy on the supply chain or logistics risk management processes. The above characteristics are listed in **Table 2**.

3.3. Data Collection and Research Instrument

The study combined structured questionnaire to obtain the perceptions of employees working in food manufacturing companies in Kingdom of Saudi Arabia about Logistics Risk Management, Supply Chain Continuity and Operational Capabilities. The dimensions and measurement items were developed based on a review of the relevant literature and were modified to fit the context of Saudi food manufacturing companies, as presented in **Table 1**.

The questionnaire consisted of two main sections: The first section gathered information about the respondent and the organization such as sex, age, educational qualification, current position in the company, functional department, year of experience, year of experience at the current company, company size, chief area of food production and having formal procedures or policies in place for managing supply chain or logistics risks. The second section measured the study variables.

Logistics Risk Management was measured as a multidimensional construct comprising four dimensions: Risk Identification, Risk Assessment, Risk Mitigation, and Risk Control, with five items for each dimension. Supply Chain Continuity was measured using eight items reflecting the organization's ability to keep critical supply chain activities and flows intact during operational disruptions were used to measure Supply Chain Continuity. Operational Capabilities were also measured using eight items assessing the organization's ability to efficiently accomplish and to sustain the basic activities of the organization in operation and coordinate the various resources and respond to the changing operational circumstances.

The respondents were asked to indicate their level of agreement with each statement using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire was completed by respondents with relevant experience and involvement in supply chain management, logistics, procurement, operations, production, warehousing, distribution, risk management, and quality management activities.

A total of 275 valid responses were obtained and used for the subsequent statistical analysis. The collected data were coded and prepared for analysis to assess the reliability and validity of the measurement instrument, examine the relationships among the study variables, test the proposed direct effects, and evaluate the mediating role of Supply Chain Continuity.

Table 1. Measurement Constructs, Dimensions, and Sources

Variable	Dimension	N	Key References
Logistics Risk Management (LRM)	Risk Identification	5	Jüttner (2005); Tang & Musa (2011); Sahab & Oulfarsi (2026)
	Risk Assessment	5	Aqlan & Lam (2015); Fan & Stevenson (2018); Lei et al. (2026)
	Risk Mitigation	5	Norrman & Jansson (2004); Kırılmaz & Erol (2017); Sahab & Oulfarsi (2026)
	Risk Control	5	Manuj & Mentzer (2008); Fan & Stevenson (2018); Sahab & Oulfarsi (2026)
Supply Chain Continuity (SCC)	Mediating Variable	8	Christopher & Peck (2004); Simchi-Levi et al. (2018); Nel (2024); Chen et al. (2025)
Operational Capabilities (OC)	Dependent Variable	8	Helfat & Winter (2011); Brusset & Teller (2017); Munir et al. (2020); Rehman et al. (2022)

3.4. Data Analysis

An electronic questionnaire was used to collect data from employees and managers working in food manufacturing companies in the Kingdom of Saudi Arabia. A total of 275 valid responses were obtained and included in the statistical analysis. Respondents were informed that the questionnaire was conducted for academic research purposes and that their participation was voluntary. The confidentiality and anonymity of the collected responses were maintained throughout the research process.

The collected data was then analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the model of planning research that has been proposed. The analysis was carried out in two major phases. The initial stage of the study was to examine the measurement model by analyzing indicator reliability, internal consistency reliability, convergent and discriminant validities. The reliability of indicators was determined by factor loadings, and the reliability of the items was assessed in terms of Cronbach's alpha, rho_A and Composite Reliability (CR). Convergent validity was examined by the Average Variance Extracted (AVE) and discriminant validity was examined by Heterotrait-Monotrait (HTMT) ratio and heterogeneous effect criterion of Fornell-Larcker.

The second stage was the analysis of structural model to examine and empirically test the hypothesized relationships between Logistics Risk Management, Supply Chain Continuity, and Operational Capabilities variables. The path coefficients (β) values, their t-values, and p-values with 5,000 subsample bootstrapping were evaluated to test the significance of hypothesized relationships. Effect sizes (f^2) and predictive relevance (Q^2) were also evaluated and the coefficient of determination (R^2) was used as a measure of the explanatory power of the endogenous constructs. In addition, the Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI) were used to assess the overall model fit.

Finally, the direct relationships expected between Logistics Risk Management (H1) and Supply Chain Continuity (H2) and between Logistics Risk Management (H3) and Operational Capabilities were tested, based on the significance, direction and magnitude of the path coefficients. Secondly, the indirect effect between Logistics Risk Management and Operational Capabilities was examined to investigate, whether there is a mediating role of "Supply Chain Continuity" (H4), between these variables.

4. Results

4.1 Demographic Characteristics of the Respondents

A total of 275 valid responses were obtained from employees and managers working in food manufacturing companies in the Kingdom of Saudi Arabia. The respondents comprised of various organizational, functional roles and responsibilities in relation to supply chain management, logistics, procurement, operations, production, warehousing, distribution, risk management and quality management. The demographic and organizational characteristics were examined as background information about the study samples' professional background and organizational context, **Table 2**.

The sample was predominantly male, with 210 respondents (76.4%), while 58 respondents (21.1%) were female. In terms of age, the top age group was those aged 30-39 years (39.3%) followed by 40-49 years. Respondents aged 26–30 years represented 18.5% of the sample, while those aged 50 years and above accounted for 12.0%. Only 2.5% of the respondents were aged between 20 and 25 years.

For educational attainment, the highest proportion of respondents had a Bachelor's degree (60.7%) while 24.7% had a Master's degree. People in possession of Diploma represented 7.6% and 5.1% those with Doctorate degree. The remaining 1.8% reported other educational qualifications .

With respect to job position, the largest group consisted of Middle Management (29.5%), followed by Specialists (25.5%) and Supervisors (21.8%). Another job position category reported by 5.1% of the respondents was other while 18.2% were senior/Top Management. The distribution shows respondents of different managerial and professional levels included in the study, giving voice to the people who are directly engaged in operational and supply chain related activities and decision making.

Regarding functional department, respondents were largely working in the Supply Chain Management department (16.0%), Operations department (14.5%), Logistics department (13.8%) and Production department (12.7%). Procurement (9.5%), Quality Management (8.4%), Warehousing (7.6%), Risk Management (6.5%), Distribution (6.2%) and other related departments (4.7%) received the rest of the responses .

Regarding experience, the largest proportion of respondents had 5–10 years of experience (34.2%), followed by those with 11–15 years of experience (27.3%). Over 15 years of working experience accounted for 21.5% and under 5 years of working experience accounted for 16.7% of the respondents. Regarding experience within the current company, the largest group had worked for 6–10 years (36.7%), followed by those with 3–5 years of experience

(25.8%). Respondents with less than three years and more than ten years of experience in their current organizations represented 18.9% and 18.5%, respectively .

The respondents represented companies of different sizes. Companies employing 500 employees or more constituted the largest category (36.7%), followed by businesses with 250-499 employees (27.3%) and businesses with 50-249 employees (25.5%). The companies that had less than 50 employees accounted for 10.5% of the sample.

The participating organizations also represented different areas of food manufacturing. Processed and packaged foods (20.7%) represented the largest category. This was followed by Dairy products and other food products each accounting for 15.6%, then Meat and poultry products (13.8%), Bakery and cereal products (12.4%), Beverages (11.3%) and Frozen foods (10.5%). This distribution represents various segment of Saudi Food Manufacturing Industry. Lastly, most participants (82.9%) stated that their organizations had formal procedures or policies on supply chain or logistics risk management. In contrast, 10.2% reported that such procedures did not exist, while 6.9% were unsure.

Table 2. Demographic Characteristics

Characteristic	Category	n	%
Gender	Male	210	76.4
	Female	58	21.1
	20 – 25 years	7	2.5
Age	26 - 30 years	51	18.5
	30–39 years	108	39.3
	40–49 years	83	30.2
	50 years and above	33	12.0
Educational Qualification	Diploma	21	7.6
	Bachelor's degree	167	60.7
	Master's degree	68	24.7
	Doctorate	14	5.1
	Other	5	1.8
Job Position	Senior/Top Management	50	18.2
	Middle Management	81	29.5
	Supervisor	60	21.8
	Specialist	70	25.5
	Other	14	5.1
Functional Department	Supply Chain Management	44	16.0
	Logistics	38	13.8
	Procurement	26	9.5
	Operations	40	14.5
	Production	35	12.7
	Warehousing	21	7.6
	Distribution	17	6.2
	Risk Management	18	6.5
	Quality Management	23	8.4

Characteristic	Category	n	%
	Other	13	4.7
Experience	Less than 5 years	46	16.7
	5–10 years	94	34.2
	11–15 years	75	27.3
	More than 15 years	59	21.5
Years of Experience in the Current Company	Less than 3 years	52	18.9
	3–5 years	71	25.8
	6–10 years	101	36.7
	More than 10 years	51	18.5
Company Size	Less than 50 employees	29	10.5
	50–249 employees	70	25.5
	250–499 employees	75	27.3
	500 employees or more	101	36.7
Primary Area of Food Manufacturing	Dairy products	43	15.6
	Meat and poultry products	38	13.8
	Bakery and cereal products	34	12.4
	Beverages	31	11.3
	Processed and packaged foods	57	20.7
	Frozen foods	29	10.5
	Other food products	43	15.6
Formal Supply Chain/Logistics Risk Procedures	Yes	228	82.9
	No	28	10.2
	Not sure	19	6.9
Total		**275**	**100.0**

4.2 Measurement Model Assessment

The measurement model was assessed before examining the hypothesized structural relationships. The assessment focused on indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The model included four dimensions of Logistics Risk Management, namely Risk Identification, Risk Assessment, Risk Mitigation, and Risk Control, together with Supply Chain Continuity as the mediating construct and Operational Capabilities as the endogenous construct.

As shown in Table 3, the standardized outer loadings ranged from 0.73 to 0.91. All measurement items exceeded the commonly accepted threshold of 0.70, indicating satisfactory indicator reliability. Consequently, no measurement items were removed from the analysis, and all indicators were retained because they demonstrated adequate statistical performance and theoretical relevance to their respective constructs.

The five indicators measuring Risk Identification produced loadings ranging from 0.76 to 0.88. The items associated with Risk Assessment ranged from 0.75 to 0.89, while those measuring Risk Mitigation ranged from 0.74 to 0.90. For Risk Control, the loadings ranged from 0.77 to 0.88, **Table 3**.

The eight indicators measuring Supply Chain Continuity demonstrated satisfactory loadings ranging from 0.73 to 0.89, indicating that the items appropriately captured the organization's ability to maintain critical supply chain and logistics activities during unexpected disruptions. Similarly, the eight indicators measuring Operational Capabilities ranged from 0.75 to 0.91, demonstrating satisfactory relationships between the observed indicators and the underlying construct.

Overall, the factor-loading results indicate that the measurement items provide reliable representations of their respective latent constructs and are suitable for subsequent reliability, validity, and structural model assessment.

Table 3. Structure of the Instrument and Factor Loadings

Construct	Item	Statement	Loading
Risk Identification	RI1	Our company systematically identifies potential risks affecting logistics activities.	0.84
	RI2	Our company regularly monitors potential sources of disruption in transportation, warehousing, and distribution activities.	0.81
	RI3	Our company uses available information to detect logistics risks at an early stage.	0.88
	RI4	Our company identifies vulnerabilities that may interrupt the flow of materials or products.	0.76
	RI5	Our company regularly reviews emerging logistics risks that may affect supply chain operations.	0.85
Risk Assessment	RA1	Our company evaluates the likelihood of identified logistics risks occurring.	0.82
	RA2	Our company assesses the potential impact of logistics risks on business operations.	0.86
	RA3	Our company prioritizes logistics risks according to their potential severity.	0.89
	RA4	Our company analyzes how logistics disruptions could affect production and distribution activities.	0.75
	RA5	Our company uses risk assessments to support decisions regarding logistics operations.	0.84
Risk Mitigation	RM1	Our company develops appropriate actions to reduce the likelihood of logistics disruptions.	0.86
	RM2	Our company prepares alternative arrangements for important logistics activities when disruptions occur.	0.82
	RM3	Our company maintains contingency plans for significant logistics risks.	0.90
	RM4	Our company takes preventive measures to reduce the potential impact of logistics disruptions.	0.74
	RM5	Our company develops alternative options for maintaining logistics activities during unexpected disruptions.	0.85
Risk Control	RC1	Our company continuously monitors important logistics risks.	0.83
	RC2	Our company regularly evaluates the effectiveness of logistics risk management measures.	0.86
	RC3	Our company uses performance indicators to monitor potential logistics disruptions.	0.77

Construct	Item	Statement	Loading
	RC4	Our company updates its risk management procedures when logistics conditions change.	0.88
	RC5	Our company takes corrective action when deviations or emerging logistics risks are detected.	0.84
Supply Chain Continuity	SCC1	Our company is able to maintain the flow of critical materials during unexpected disruptions.	0.82
	SCC2	Our company is able to continue essential supply chain activities when disruptions occur.	0.86
	SCC3	Our company is able to maintain the flow of products to customers during periods of disruption.	0.84
	SCC4	Our company is able to maintain critical logistics activities despite unexpected interruptions.	0.79
	SCC5	Our company is able to minimize interruptions to production caused by supply chain disruptions.	0.73
	SCC6	Our company is able to maintain the availability of essential resources during disruptions.	0.81
	SCC7	Our company is able to continue critical distribution activities when normal logistics arrangements are disrupted.	0.85
	SCC8	Our company is able to maintain the continuity of key supply chain operations during unexpected events.	0.89
Operational Capabilities	OC1	Our company is able to carry out its core operational activities efficiently.	0.85
	OC2	Our company is able to coordinate resources effectively across operational activities.	0.83
	OC3	Our company is able to maintain stable production operations under changing conditions.	0.88
	OC4	Our company is able to respond effectively to changes affecting operational requirements.	0.86
	OC5	Our company is able to allocate operational resources efficiently when conditions change.	0.80
	OC6	Our company is able to maintain effective logistics and distribution operations.	0.75
	OC7	Our company is able to adapt its operational processes when unexpected problems arise.	0.84
	OC8	Our company is able to maintain the required level of operational performance during periods of uncertainty.	0.91

4.3 Reliability and Convergent Validity

The reliability and convergent validity are presented in Table 4. Internal consistency reliabilities of the constructs were satisfactory. The Cronbach's alpha was in the range from 0.88 to 0.94, while the rho_A was in the range from 0.89 to 0.95. The composite reliability values for the items ranged from 0.91 to 0.95, which is above the 0.70 level that is recommended. This data, therefore, shows good consistency of measures across each construct. The Average Variance Extracted (AVE) values of all the variables were above 0.50 which is the minimum recommended value (0.52 – 0.72), in addition. These results support the acceptable convergent validity and suggest that the variance in measurement indicators accounted for over half of the variance for each construct, **Table 4**.

The dimensions of Logistics Risk Management had excellent reliability and convergent validity, especially for Risk Assessment and Risk Mitigation. The result for Supply Chain Continuity and Operational Capabilities also ended up in the satisfactory band range, supporting that item consistently measured the Supply Chain Continuity and Operational Capabilities outcomes.

4.4 Discriminant Validity

The Heterotrait–Monotrait ratio (HTMT) was used to test for discriminant validity. All HTMT values are shown in Table 5 and were found to be less than the conservative limit of 0.85. The validity of the constructs was established as the highest observed HTMT value: 0.83. This result might be useful to the four dimensions of Logistics Risk Management as they are conceptually and interconnected but distinct practices. Risk Identification is about identifying and early warning potential logistics risks, while Risk Assessment is about analyzing probability and possible implication. Risk Mitigation means the implementation of preventive and contingency measures, Risk Control refers to continuous monitoring, evaluation, and adaptation of a risk mitigation program, **Table 5**.

The analysis of the results of the HTMT also showed adequate empirical distinction between Logistics Risk Management practices, Supply Chain Continuity and Operational Capabilities. Therefore, the measurement model satisfies the discriminant validity requirements and provides an appropriate basis for structural model assessment.

4.5 Structural Model Assessment

Following confirmation of the reliability and validity of the measurement model, the structural model was evaluated to examine the presented relationships between Logistics Risk Management, Supply Chain Continuity and Operational Capabilities.

The model fit indicators, the coefficient of determination (R^2), the predictive relevance (Q^2) and effect sizes (f^2) were part of the assessment. From the results, it is found that the four dimensions Logistics Risk Management explained the percentage of variance of Supply Chain Continuity jointly is 61% ($R^2 = 0.61$). This means that there is significant explanatory power and that there is value in logistics risk management practices in being able to maintain critical activities in the supply chain during disruptions. Model accounted for $R^2 = 0.58$ or 58% of the variance in Operational Capabilities. The finding shows that, in addition to the direct contribution of Logistics Risk Management, there is considerable explanatory power for the differences of food manufacturing companies in terms of operational capabilities when taking Supply Chain Continuity into account, **Table 6**.

The Q^2 values were: Supply Chain Continuity: 0.39, and Operational Capabilities: 0.41. As both values are more than a value observable in the real world, the model is likely to be of satisfactory predictive relevance for both the endogenous constructs.

The SRMR for the model was also acceptable (SRMR = 0.058) and its NFI index value (NFI = 0.91) indicates an acceptable fit. In fact, the results obtained from the two analyses suggest the structural model used for this study is appropriate for hypothesis testing as it has good explanatory and predictive power, **Table 6**.

4.6 Hypotheses Testing

The proposed structural relationships were examined using the bootstrapping procedure with 5,000 subsamples. The assessment of the hypotheses was based on the standardized path coefficients (β), t-values, and p-values. The structural model was developed around four main hypotheses. Logistics Risk Management (LRM) was conceptualized as a multidimensional independent construct comprising four underlying dimensions: Risk Identification, Risk Assessment, Risk Mitigation, and Risk Control. Therefore, these dimensions were not treated as separate hypotheses in the structural model. Instead, they were incorporated as components of the overall Logistics Risk Management construct, while their relative contributions were examined to provide a more detailed interpretation of the role of Logistics Risk Management.

The results indicate that all four proposed hypotheses were supported. Logistics Risk Management was strongly positive and statistically significant to Supply Chain Continuity. Operational Capabilities was also greatly positively affected by Supply Chain Continuity. Further, Logistics Risk Management had a substantial direct link with Operational Capabilities. Lastly for Logistics Risk Management, Operational Capabilities were statistically significantly affected by (logistics) SC Continuity, lending support to the postulated mediating role in the proposed model. It shows, overall, that the good achievement of Logistics Risk Management is considered to be a significant aspect of strengthening Operational Capabilities both directly and indirectly by maintaining Supply Chain Continuity.

4.6.1 H1: The Effect of Logistics Risk Management on Supply Chain Continuity

The results demonstrate that Logistics Risk Management has a strong positive and statistically significant effect on Supply Chain Continuity ($\beta = 0.74$, $T = 15.63$, $p < 0.001$). Therefore, H1 is supported, **Table 7**.

The magnitude of the path coefficients showed that Logistics Risk Management is an important determinant of SC Continuity among Sarahi Arabia's food manufacturing firms. Companies with more mature logistics risk management seem to have a better ability to continue material flow and logistics operations, as well as the continuity of production resources and product supply operation during times of disruption and uncertainty.

The Logistics Risk Management was conceived as a multidimensional phenomenon, so more analysis was conducted in this regard to know which of the four dimensions of the phenomenon affected the other ones more. Results indicate that all four dimensions contributed positively to the overall construct of the Logistic Risk Management construct with meaningful contributions. Risk Mitigation and Risk Control contributed at 0.88 and 0.85 respectively, followed by Risk Assessment (0.82) and also Risk Identification (0.78) contributed at respectable level, **Table 8**.

The results show that all dimensions are crucial parts in Logistics Risk Management. The logistics risk management, however, is largely a function of the relatively greater contribution of the Risk Mitigation, however, which would present the implementation of preventive action, contingency plans, alternative logistics arrangements and/or other measures to mitigate the consequences arising from potential disruptions as a very important aspect as effective logistics risk management. Likewise, the significant involvement of Risk Control underscores the need for ongoing monitoring and assessment of shifting conditions of risk.

Concurrently, the work of the components of Risk Identification and Risk Assessment shows the tool's effectiveness from a first step is the capacity to identify possible sources of disruption and to systematically assess risk and risk impact. It is therefore important to consider the four dimensions as complementary activities, not isolated to the separate dimensions. Risk Identification and Risk Assessment give information and analysis as a foundation to the decision-making process and then Risk Mitigation and Risk Control are used as a basis for implementing and managing appropriate responses continuously.

Overall, the findings of the study indicate that the concept of Logistics Risk Management should be seen as one organizational capability and not a set of activities which are confined to the realm of risks. A combination of risk identification, assessment, mitigation and risk control creates better support for the continuity of the chain activities in case of disruptions. This holistic approach is of great importance in food manufacturing companies, for example, where production processes, distribution activities, or transportation issues could potentially disrupt operational continuity as a result of interruptions in the supply of either the raw materials or the production methods.

4.6.2 H2: The Effect of Supply Chain Continuity on Operational Capabilities

The results show that Supply Chain Continuity has a positive and statistically significant effect on Operational Capabilities ($\beta = 0.46$, $T = 8.74$, $p < 0.001$). Therefore, H2 is supported, **Table 7**.

This finding indicates that the ability of food manufacturing companies to maintain critical supply chain activities during periods of disruption contributes significantly to their Operational Capabilities. Organizations that are able to sustain the availability and movement of materials, maintain logistics and distribution activities, and minimize interruptions in supply chain flows are better positioned to continue their production processes and respond effectively to changing operational requirements.

The magnitude of the path coefficient ($\beta = 0.46$) indicates a meaningful positive relationship between Supply Chain Continuity and Operational Capabilities. This suggests that Supply Chain Continuity is not merely an operational outcome but also represents an important organizational mechanism that supports the effective utilization and coordination of resources.

When critical supply chain flows are maintained, companies are more capable of minimizing production interruptions, allocating resources efficiently, responding to operational challenges, and sustaining coordination between different organizational functions. Conversely, disruptions in material availability, transportation, warehousing, or distribution may limit an organization's ability to utilize its operational resources effectively, even when those resources are otherwise available.

Accordingly, the findings demonstrate that Supply Chain Continuity represents an important organizational capability for food manufacturing companies in Saudi Arabia. Maintaining continuity across critical supply chain activities enables organizations to preserve operational stability and strengthen their capacity to respond effectively under conditions of uncertainty and disruption.

4.6.3 H3: The Effect of Logistics Risk Management on Operational Capabilities

The results indicate that Logistics Risk Management has a positive and statistically significant direct effect on Operational Capabilities ($\beta = 0.31$, $T = 5.68$, $p < 0.001$). Therefore, H3 is supported, **Table 7**.

This finding demonstrates that the benefits of effective Logistics Risk Management extend beyond its contribution to maintaining Supply Chain Continuity. Companies that systematically identify, assess, mitigate, and control logistics-related risks are also better able to strengthen their broader Operational Capabilities.

A positive direct relation means that implementing effective risk management will lead to better preparedness and equipping companies with better means to make informed decisions on resource allocation, operational strategy, response strategy etc. Improving the planning, management, and control of potential disruption in the logistics can enable organizations to become more flexible and responsive if they encounter logistics issues.

The findings also showed that Logistics Risk Management directly affects the coordination capabilities of organizations and flexibility in responding to changing situations related to operational resources. Given the significance of the direct effect ($\beta = 0.31$), it follows that Logistics Risk Management is a dimension more than an organization's capacity to reduce the harmful impacts of single risks events, and that the construct merits more careful consideration and study.

But the direct effect is less than Supply Chain Continuity (SCC) ($\beta = 0.74$) and Logistics Risk Management. It is interesting to note that Logistics Risk Management has a direct influence upon Operational Capabilities, but much of its indirect influence comes through its ability to ensure the continuity of the supply chain activities. This kind of relationship is explored in more detail in the mediation analysis performed under H4.

4.6.4 H4: The Mediating Role of Supply Chain Continuity

The mediating role of Supply Chain Continuity in the relationship between Logistics Risk Management and Operational Capabilities was examined using the bootstrapping procedure with 5,000 subsamples.

The results demonstrate that the indirect effect of Logistics Risk Management on Operational Capabilities through Supply Chain Continuity was positive and statistically significant ($\beta = 0.28$, $T = 5.97$, $p < 0.001$). Therefore, H4 is supported, **Table 7**.

This finding indicates that Logistics Risk Management improves Operational Capabilities not only through its direct influence but also by strengthening the organization's ability to maintain the continuity of critical supply chain activities. More specifically, the integrated practices of Risk Identification, Risk Assessment, Risk Mitigation, and Risk Control collectively contribute to reducing the likelihood and consequences of logistics disruptions. Improved Supply Chain Continuity subsequently enables organizations to maintain production activities, coordinate resources, sustain logistics operations, and respond more effectively to changing operational conditions.

The direct relationship between Logistics Risk Management and Operational Capabilities also remained statistically significant ($\beta = 0.31$, $T = 5.68$, $p < 0.001$) following the inclusion of Supply Chain Continuity in the structural model. The presence of both a statistically significant direct effect and a statistically significant indirect effect indicates that Supply Chain Continuity plays a partial mediating role in the relationship between Logistics Risk Management and Operational Capabilities, **Table 9**.

These findings suggest the existence of two complementary pathways through which Logistics Risk Management contributes to Operational Capabilities. The first is a direct pathway through which effective risk management improves organizational preparedness, flexibility, responsiveness, and resource coordination. The second is an indirect pathway through which effective Logistics Risk Management enhances the organization's ability to maintain the continuity of material, information, and product flows, which subsequently contributes to stronger Operational Capabilities.

The indirect effect (β = 0.28) also represents a substantial proportion of the overall influence of Logistics Risk Management on Operational Capabilities. This result highlights the importance of Supply Chain Continuity as an explanatory mechanism linking risk management practices with operational outcomes. Therefore, the results suggest that the benefits of Logistics Risk Management are not achieved solely through direct improvements in organizational processes, but also through the organization's ability to prevent or minimize interruptions in critical supply chain activities.

Accordingly, Supply Chain Continuity represents an important mechanism through which integrated Logistics Risk Management practices are translated into improved Operational Capabilities within Saudi food manufacturing companies.

4.7 Effect Size Analysis

Effect sizes were assessed using f^2 to determine the substantive contribution of the exogenous constructs to the explanatory power of the endogenous constructs. The results of the hypothesis testing reflect statistical significance for each of the hypothesized relationships, while the f^2 values offer further support in terms of the applicability of the relationships to the structural model.

The results indicate that the Logistics Risk Management factor has the strongest influence on Supply Chain Continuity with a f^2 of 0.31. This result is in harmony with the strong structural relation found under H1, and indicates a substantive significance of integrated approaches to risk management in ensuring continuity of activities in the supply chain.

Operational Capabilities significantly improved with significant Supply Chain Continuity ($f^2 = 0.29$) demonstrating that maintaining critical supply chain activities holds meaning for organizations with respect to their operational capabilities. This finding further aligns with H2 and highlights the need for continuity to be a critical factor in supporting effective operations in times of disruption.

The direct contribution of Logistics Risk Management towards the Operational Capabilities itself was also found significant ($f^2 = 0.13$). This effect though was not as large as the contribution of Logistics Risk Management towards Supply Chain Continuity and the contribution of Supply Chain Continuity towards Operational Capabilities, but it constitutes another form of evidence that risk management can make a distinct contribution to enhancing Operational Capabilities, **Table 10**.

The effect size results generally support the hypothesis testing results. Logistics Risk Management had the greatest substantive impact on Supply Chain Continuity and both Logistics Risk Management and Supply Chain Continuity had an impact in explaining the variations in Operational Capabilities. The absence is also consistent with the partial mediation result for H4, which suggests that SCF is an important, but non-exclusive mediator in how Logistics Risk Management enhances Operational Capabilities.

Table 4. ***Reliability and Convergent Validity***

Construct	CR	rho_A	(rho_c)	AVE
Risk Identification	0.89	0.90	0.92	0.69
Risk Assessment	0.90	0.91	0.93	0.72
Risk Mitigation	0.90	0.91	0.93	0.71
Risk Control	0.89	0.90	0.92	0.70
Supply Chain Continuity	0.93	0.94	0.94	0.67
Operational Capabilities	0.94	0.95	0.95	0.70

Note: All reliability coefficients exceed 0.70, and all AVE values exceed 0.50, indicating satisfactory internal consistency reliability and convergent validity.

Table 5. HTMT Discriminant Validity

Construct	RI	RA	RM	RC	SCC	OC
Risk Identification (RI)	—					
Risk Assessment (RA)	0.78	—				
Risk Mitigation (RM)	0.74	0.81	—			
Risk Control (RC)	0.76	0.79	0.83	—		
Supply Chain Continuity (SCC)	0.69	0.73	0.80	0.77	—	
Operational Capabilities (OC)	0.64	0.68	0.75	0.72	0.82	—

Note: All HTMT values are below 0.85, supporting discriminant validity.

Table 6. Structural Model Assessment

Endogenous Construct	R^2	Q^2
Supply Chain Continuity	0.61	0.39
Operational Capabilities	0.58	0.41

Model Fit	Value
SRMR	0.058
NFI	0.91

Table 7. Results of Hypotheses Testing

	Relationship	β	T-value	P-value
H1	Logistics Risk Management → Supply Chain Continuity	0.74	15.63	<0.001
H2	Supply Chain Continuity → Operational Capabilities	0.46	8.74	<0.001
H3	Logistics Risk Management → Operational Capabilities	0.31	5.68	<0.001
H4	Logistics Risk Management → Supply Chain Continuity → Operational Capabilities	0.28	5.97	<0.001

Table 8. Relative Contribution of Logistics Risk Management Dimensions

Dimension	Contribution/Loading	Relative Contribution
Risk Identification	0.78	Moderate
Risk Assessment	0.82	High
Risk Mitigation	0.88	Highest
Risk Control	0.85	High

Table 9. Mediation Analysis

	Indirect Relationship	Direct Effect	Indirect Effect	T	P	Mediation
H4	Logistics Risk Management → Supply Chain Continuity → Operational Capabilities	0.31	0.28	5.97	<0.001	Partial Mediation

Table 10. Effect Size (f^2)

Relationship	f^2	Effect Size
Logistics Risk Management → Supply Chain Continuity	0.31	Medium
Supply Chain Continuity → Operational Capabilities	0.29	Medium
Logistics Risk Management → Operational Capabilities	0.13	Small

5.Discussion

The present study examined the relationships between Logistics Risk Management (LRM), Supply Chain Continuity (SCC), and Operational Capabilities (OC) among food manufacturing companies in Saudi Arabia. Integrated logistics risk management increases operational ability directly and indirectly by supply chain continuity based on both the Dynamic Capabilities Theory and Organizational Information Processing Theory. Overall, all four hypotheses were supported, providing empirical evidence that systematic risk management an important organizational capability to ensure effective functioning of critical supply chain activities and build-up of operational capability in uncertainties and in circumstance of disruption .

The structural model demonstrated satisfactory explanatory and predictive capability. Logistics Risk Management accounted for 61% variance in Supply Chain Continuity and Logistics Risk Management and Supply Chain Continuity accounted for 58% variance in Operational Capabilities. Besides, positive Q^2 values and satisfactory model fit measures (SRMR = 0.058 and NFI = 0.91) indicate that the proposed model provides meaningful explanatory and predictive value within the Saudi food manufacturing context.

The first result indicated that Logistic Risk Management has positive and significant value with Logistic Performance $\beta = 0.74$ ($p < 0.001$), thus supporting H1. This finding provides confirmation that systematic identification, assessment, mitigation and control of logistics risks are essential for the continuity of the activities of the supply chain as these are the strongest link in the model. This finding is consistent with previous research showing that supply chain risk management practices improve firms' ability to reduce the consequences of disruptions and strengthen resilience and continuity (El Baz & Ruel, 2021; Munir et al., 2024; Sahab & Oulfarsi, 2026).

This finding can also be interpreted through Dynamic Capabilities Theory (Teece et al., 1997; Teece, 2007), which emphasizes organizations' ability to sense environmental changes, respond to the new opportunities, and reconfigure their resources as well as processes. The LRM is viewed here as an adaptation — not as a defensive measure only. Late risk detection and assessment allow companies to respond to the potential disruption in advance, finding other ways to do business before disruptions have a major impact on logistics operations. This interpretation is also supported by Organizational Information Processing theory because effective risk management requires the timely collection, analysis and use of information on suppliers, transportation, inventory and other components of logistics. (Galbraith, 1974, Tushman & Nadler, 1978).

The relative contributions of the LRM dimensions provide further support for this interpretation. Risk Mitigation contributed the most, followed by Risk Control and Risk Assessment at a significant level and also Risk Identification contributed. This implies that no risks are identified, but they must become real assets that enable the organisation to work out plans of action and alternative transport arrangements, supplier's diversification and buffering inventories. The same is true with continuous monitoring as the risk of logistics fluctuates over time. This aligns with the process view of supply chain risk management introduced by Jüttner (2005), Manuj and Mentzer (2008), and Fan and Stevenson (2018), that risk management is a process that is integrated and continuous.

The second finding supported H2, demonstrating that Supply Chain Continuity was found to significantly positively influence the operational capabilities ($\beta = 0.46$, $p < 0.001$). The result of this finding is that capacity for materials, information, transportation and distribution flow helps firms to run production and co-ordinate resources more effectively. This is in line with Brusset and Teller (2017), who highlighted the need for and the value of organizational capacities in supply chain disruption management, including integration and flexibility, as well as recent research that has been found to be more strongly associated with capacities related to resilience and better performance of operations.

Conceptually, this finding demonstrates that Supply Chain Continuity should not be viewed solely as an outcome of effective risk management. Rather it is more of a supporting organizational quality. With uninterrupted critical supply chains, businesses can make optimal use of their resources and continue to operate production processes. On the other hand, even a company with sufficient resources can suffer from lowered capacity due to disruption in materials, transport, or distribution resources. This relationship is particularly relevant to food manufacturing, where operations depend on time-sensitive inputs, reliable transportation, appropriate storage conditions, and continuous production and distribution processes (Guntuka & Carnovale, 2024; Chen et al., 2025).

The third finding supported H3, showing that Logistics Risk Management has a positive direct relationship with Operational Capabilities ($\beta = 0.31$, $p < 0.001$). The advantages of risk management, however, don't end there. Effective LRM directly improves an organization's readiness, responsiveness, flexibility and decision making by giving information as to possible vulnerabilities and how the organisation can allocate its resources better. This finding aligns with the Dynamic Capabilities view, as well as prior studies that established connections between risk management capabilities and operational adaptation and performance (Rehman et al., 2022; Barhmi, 2023; Munir et al., 2024).

However, the direct effect of LRM on Operational Capabilities was smaller than its effect on Supply Chain Continuity. The effect size analysis reinforces this observation, with LRM demonstrating a medium effect on SCC ($f^2 = 0.31$) but a smaller direct effect on OC ($f^2 = 0.13$). This suggests that an important proportion of the value generated by logistics risk management is realized through its ability to maintain the continuity of critical supply chain activities.

This interpretation was confirmed during the analysis of mediation. The aforementioned correlation was supported by the current research, with Supply Chain Continuity as a significant mediator, shown in a positive direction, between Logistics Risk Management and Operational Capabilities ($\beta = 0.28$, $p < 0.001$). The direct relationship was still found to be significant so there was a partial mediation effect. Thus, LRM can enhance Operational Capabilities in two complementary ways: directly, by strengthening preparedness, flexibility and coordination of resources, and also indirectly – with the continuity of critical supply chain flows in case of disruptions.

This finding extends previous research that has primarily examined supply chain resilience as a mediating mechanism between risk management and organizational performance (Jidda Jidda et al., 2025; Lei et al., 2026). The present study proves that Supply Chain Continuity has a more specific operating mechanism in explaining the operational mechanism between logistics risk management practices and the improvement of operational capabilities. Resilience is about absorption and recovery, along with adapting, while continuity is about continuing the flow of critical supply chain activities.

In conclusion, the results reflect the integrated logic of the model proposed. Dynamic Capabilities Theory helps to understand how Logistics Risk Management helps organizations sense, respond, reconfigure resources, adapting to changes; while Organizational Information Processing Theory helps to understand the importance of timely risk information on the ability to make effective decisions and respond to changes. The combined capability ensures Saudi food manufacturing companies continue to operate their supply chain and thus helps to enhance their Operational Capabilities.

This study has a number of theoretical contributions: it views Logistics Risk Management as an organized and integrated capability of the organization, rather than just a set of defensive actions; it views Logistics Risk Management as consisting of four steps: identification, assessment, mitigation, and control; and it does not focus on the risk itself only on the readiness to respond. Based on Dynamic Capabilities Theory the findings shows that these practices are all used together to help the firms anticipate the disrupting events, neutralize the risks in the formation of disruptions, and reconfigure the resources in a manner that helps them maintain the Supply Chain Continuity and augment their Operational Capabilities. In addition, the study differentiates the concept of Supply Chain Continuity from those of resilience and robustness, showing that it is indeed a specific operational mechanism that focuses on exploiting the critical flows continuity during disruption. Moreover, Dynamic Capabilities Theory combined with Organizational Information Processing Theory provides a more comprehensive explanation of the acquisition, analysis, and utilization of risk-related information that enable responses to, and adaptation within, the organization.

The final goal was to offer empirical insights to the largely under-researched setting of Saudi food manufacturing companies, broadening knowledge of logistics risk management's impacts on operational performance.

This provides valuable implications for managers of Saudi food manufacturing companies: Logistics Risk Management should not be limited to compliance or crisis response, but should be seen as a strategic capability of the organisation. Companies need to be able to build integrated systems involving the identification, assessment, mitigation and ongoing monitoring of risks, but with a particular focus on mitigation and control because they have a strong contribution to the construct as a whole. There should be contingency planning, alternative suppliers and transportation options, buffers and constant review of logistics risks as part of practical measures. Managers, in addition, should embrace Supply Chain Continuity as a strategic performance goal and assess their supply chain risk management processes for their capacity to ensure the uninterrupted flow of materials, information, production resources and products. Other investments, such as the improvement of supply chain visibility, information sharing and logistics platform coordination with suppliers and internal functions, can also help to identify risks early and react quickly to avoid the chain from slipping into more significant disruptions, or from becoming an operational crisis.

There are a number of limitations inherent in this study. The cross-sectional design precludes investigators from studying causal relationships and trends in logistics risk management and continuity capabilities over time; further research is warranted to assess these relationships before, during and after disruption events, which could be a longitudinal study. Furthermore, the present study is conducted on food manufacturing enterprises in Saudi Arabia, so the results cannot be generalized to other companies or to other countries without taking that into account. Future studies need to be comparative in nature involving other companies and countries. Additionally, other mediators are suggested by the partial mediation results such as supply chain resilience, digital agility, supply chain visibility, organizational flexibility, and information-processing capability, which can be examined in future research for the relationship between Logistics Risk Management and Operational Capabilities. In conclusion, the study was conducted based on the perceptions of the respondents, which means that in the future, it is advisable to combine the various types of survey data with objective data such as the delivery performance, production downtime, availability of inventory, recovery time and loss of income due to disturbance in order to provide a more comprehensive assessment of the proposed relationships.

6. Conclusion

The present study focuses on the relationships between Logistics Risk Management, Supply Chain Continuity and Operational Capabilities among the food manufacturing companies in Saudi Arabia. Based on Dynamic Capabilities Theory and Organizational Information Processing Theory, the research posited that logistics risk management is an important organizational capability that helps companies uncover, analyze, reduce and manage logistics risks, while assuring supply chain continuity and enhancing the logistics capacities of the companies.

It provided support for all hypothesized. First, the positive correlation with Supply Chain Continuity confirmed a significant positive effect of Logistics Risk Management, underscoring the importance of integrated risk management techniques in ensuring the continuity of materials, information, production inputs and products during times of disruption. Of the underlying dimensions, Risk Mitigation and Risk Control were the best indicators, emphasizing the need for contingency planning, alternative logistics arrangements, ongoing monitoring, and prompt corrective activities.

Second, SC Continuity is shown to positively impact on Operational Capabilities. This discovery shows that the capability to stay active in key links is not only an operational result, but also an important mechanism that helps companies to keep going with production activities, manage resources optimally, avoid production disruption and adjust to new conditions in production processes.

Thirdly, Logistics Risk Management also directly influenced Operational Capabilities to a significant extent. The result has showed that systematic risk management directly helps the organization be prepared, flexible and also helps in decision-making as well as in the efficient coordination of the resources. Lastly, the mediation analysis revealed that Supply Chain Continuity partially mediated the relationship between Logistics Risk Management and Operational Capabilities. Therefore, logistics risk management is becoming the means to improve operational capabilities in two respects: directly and in indirect way by supporting the maintenance of important flows in supply chains.

Overall, the study demonstrates that Saudi food manufacturing companies can strengthen their operational capabilities by adopting an integrated approach to logistics risk management rather than treating risk-related activities as isolated procedures. The findings emphasize that effective identification, assessment, mitigation, and ongoing control of logistics risks can decrease exposure to disruption, while helping to maintain continuity in the supply chain. The focus of this article is therefore on how risk management processes transform into the capabilities of organizations: Supply Chain Continuity becomes a key organizational mechanism for doing so.

The study thus extends the concept of Supply Chain risk management literature, explicitly by considering SC Continuity as a mediating capability between Logistics Risk Management and Operational Capabilities. At the very real level, the results offer practical advice to managers in the Saudi food manufacturing industry so that they can adopt a proactive risk management system, prepare contingency plans, continuously monitor, and expand the logistics options for achieving operating stability in the changing and disquiet safe operations business environment.

References

1. Abdulsalam, A., Ibrahim, S., Aruwa, S. A. S. (2026). Effect of Supply Chain Risk Management Strategies on the Operational Performance of Manufacturing Firms in Dangote Cement Plc, Obajana Plant, Kogi State. International Journal of Research and Innovation in Social Science, 10(1), https://doi.org/10.47772/IJRISS.2026.10100337
2. Ahsan, T., Mirza, S. S., Gull, A. A., et al. (2023). How to deal with customer and supplier concentration to attain sustainable financial growth? The role of business strategy. *Business Strategy and the Environment, 32*, 4600–4619.
3. Aqlan, F., & Lam, S. S. (2015). Supply chain risk modelling and mitigation. *International Journal of Production Research, 53*(18), 5640–5656.
4. Arivumalar, R., & Mohan, S. (2023). A study on risk management of Global Transportation service for Shipment with refernce to right Logistics International Pvt Ltd. *Research Journal of Humanities and Social Sciences*, *14*(4), 215-223.
5. Beske, P. (2012). Dynamic capabilities and sustainable supply chain management. *International Journal of Physical Distribution & Logistics Management, 42*(4), 372–387.
6. Bode, C., Wagner, S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding responses to supply chain disruptions: Insights from information processing and resource dependence perspectives. *Academy of Management Journal, 54*(4), 833–856.
7. Chen, R., Koul, S., Kandukuri Venugopal, A., & Verma, R. (2025). Overcoming threats to supply chain continuity: a meta-analysis and 9R capability evaluation tool. *Management Review Quarterly*, 1-26.
8. Choi, T. M., Chiu, C. H., & Chan, H. K. (2016). Risk management of logistics systems. *Transportation Research Part E: Logistics and Transportation Review*, *90*, 1-6.
9. Christopher, M., & Peck, H. (2004). Building the resilient supply chain. *The International Journal of Logistics Management, 15*(2), 1–14.
10. Craighead, C. W., Blackhurst, J., Rungtusanatham, M. J., & Handfield, R. B. (2007). The severity of supply chain disruptions: Design characteristics and mitigation capabilities. *Decision Sciences, 38*(1), 131–156.
11. Deselnicu, D. C., Barbu, A., & Haddad, S. H. (2023). Risk management in a logistics company. *Risk*, *12*, 14.
12. Dza, M., Acquah, I. N., & Atsu, W. (2024). Supplier relationship management and operational performance: The mediating role of supply chain resilience. *Journal of Operations and Strategic Planning*, *7*(2), 117-140.
13. 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*, 107972.
14. Fan, Y., & Stevenson, M. (2018). A review of supply chain risk management: Definition, theory, and research agenda. *International Journal of Physical Distribution & Logistics Management, 48*(3), 205–230.
15. Galbraith, J. R. (1974). Organization design: An information processing view. *Interfaces, 4*(3), 28–36.
16. Guntuka, L., Carnovale, S., & Falcone, E. (2024). Supply chain plasticity: a responsive network capability to ensure resilience. *Journal of Business Logistics*, *45*(4), e12398.
17. Guntuka, L., Corsi, T. M., & Cantor, D. E. (2024). Recovery from plant-level supply chain disruptions: supply chain complexity and business continuity management. *International Journal of Operations & Production Management*, *44*(1), 1-31.
18. Hazen, B. T., & Sankar, C. (2015). Cross-border process innovations: Improving the fit between information processing needs and capabilities. *International Journal of Innovation and Technology Management, 12*, 1550013.
19. Helfat, C. E., & Winter, S. G. (2011). Untangling dynamic and operational capabilities: Strategy for the (N)ever-changing world. *Strategic Management Journal, 32*(11), 1243–1250.
20. Huo, B., Li, D., & Gu, M. (2024). The impact of supply chain resilience on customer satisfaction and financial performance: A combination of contingency and configuration approaches. *Journal of Management Science and Engineering, 9*, 38–52.
21. Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review, 136*, 101922.
22. Jiang, S., Yeung, A. C., Han, Z., et al. (2023). The effect of customer and supplier concentrations on firm resilience during the COVID-19 pandemic: Resource dependence and power balancing. *Journal of Operations Management, 69*, 497–518.

23. Jiang, Y., Feng, T., & Huang, Y. (2024). Antecedent configurations toward supply chain resilience: the joint impact of supply chain integration and big data analytics capability. *Journal of Operations Management*, *70*(2), 257-284.
24. Jidda Jidda, D., Zhen, L., Ashraf, S. F., et al. (2025). Value of enterprise risk management integration and supply chain performance: Mediating role of firm's resilience capability. *SAGE Open, 15*, 21582440241305618.
25. Jidda Jidda, D., Zhen, L., Ashraf, S. F., Nasir, A., & Amoako, T. (2025). Value of enterprise risk management integration and supply chain performance: Mediating role of firm's resilience capability. *Sage Open*, *15*(1), 21582440241305618.
26. Jüttner, U. (2005). Supply chain risk management. *The International Journal of Logistics Management, 16*(1), 120–141.
27. Kaluku, M. R. A., Sumiati, S., Rofiq, A., & Hadiwidjojod, D. (2025). Enhancing firm performance with supply chain risk management and supply chain resilience: The enabling role of supply chain digitalization adoption. *Brazilian Journal of Operations & Production Management, 22*(3), 2655. https://doi.org/10.14488/BJOPM.2655.2025
28. Kırılmaz, O., & Erol, S. (2017). A proactive approach to supply chain risk management: Shifting orders among suppliers to mitigate the supply side risks. *Journal of Purchasing and Supply Management, 23*(1), 54–65.
29. Kleindorfer, P. R., & Saad, G. H. (2005). Managing disruption risks in supply chains. *Production and Operations Management, 14*(1), 53–68.
30. LEI, M. Y., Zakuan, N., Hasan, M. Z., Saman, M. Z. M., Chen, X., Lei, M., & Chen, X. (2026). From Risk to Resilience: A Data-Driven Mediation Analysis of Supply Chain Risk Management and Firm Performance in Chinese Manufacturing. *Digital Technologies Research and Applications*, *5*(2), 225-237.
31. Maleki Vishkaei, B., & De Giovanni, P. (2024). The impact of business continuity on supply chain practices and resilience due to COVID-19. *Logistics*, *8*(2), 41.
32. Manuj, I., & Mentzer, J. T. (2008). Global supply chain risk management. *Journal of Business Logistics, 29*(1), 133–155.
33. Munir, M. A., Hussain, A., Farooq, M., et al. (2024). Building resilient supply chains: Empirical evidence on the contributions of ambidexterity, risk management, and analytics capability. *Technological Forecasting and Social Change, 200*, 123146.
34. Munir, M., Jajja, M. S. S., Chatha, K. A., & Farooq, S. (2020). Supply chain risk management and operational performance: The enabling role of supply chain integration. *International journal of production economics*, *227*, 107667.
35. Nel, J. D. (2024). The role of supply chain risk mitigation strategies to manage supply chain disruptions. *Journal of Transport and Supply Chain Management*, *18*, 1-12.
36. Norrman, A., & Jansson, U. (2004). Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *International Journal of Physical Distribution & Logistics Management, 34*(5), 434–456.
37. Paul, A., & Saha, S. C. (2025). A systematic literature review on flexible strategies and performance indicators for supply chain resilience. *Global Journal of Flexible Systems Management, 26*, 207–231.
38. Rehman, A., Jajja, M. S. S., & 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*, 102933.
39. Sahab, S., & Oulfarsi, S. (2024). Trends and Insights in Supply Chain Risk Management: A Comprehensive Review of Literature. *Oper. Supply Chain Manag. Int. J.*, *17*(4), 402-416.
40. Sahab, S., & Oulfarsi, S. (2026). The role of supply chain risk management in shaping supply chain resilience and robustness: Empirical evidence from Moroccan manufacturing firms. *Logistics, 10*(2), 39. https://doi.org/10.3390/logistics10020039
41. Sahab, S., & Oulfarsi, S. (2026). The Role of Supply Chain Risk Management in Shaping Supply Chain Resilience and Robustness: Empirical Evidence from Moroccan Manufacturing Firms. *Logistics*, *10*(2), 39.
42. Shekarabi, H., Ashkan, S., Mavi, R. K., & Macau, F. R. (2025). Supply chain resilience: A critical review of risk mitigation, robust optimisation, and technological solutions and future research directions. *Global Journal of Flexible Systems Management, 26*, 681–735.
43. Simchi-Levi, D., Wang, H., & Wei, Y. (2018). Increasing supply chain robustness through process flexibility and inventory. *Production and Operations Management, 27*(8), 1476–1491.
44. Tang, C. S. (2006). Perspectives in supply chain risk management. *International Journal of Production Economics, 103*(2), 451–488.
45. Tang, O., & Musa, S. N. (2011). Identifying risk issues and research advancements in supply chain risk management. *International Journal of Production Economics, 133*(1), 25–34.
46. Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319–1350.
47. Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533.
48. Tian, S., Wu, L., Ciano, M. P., et al. (2024). Enhancing innovativeness and performance of the manufacturing supply chain through datafication: The role of resilience. *Computers & Industrial Engineering, 188*, 109841.
49. Tushman, M. L., & Nadler, D. A. (1978). Information processing as an integrating concept in organizational design. *Academy of Management Review, 3*(3), 613–624.
50. Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal, 24*(10), 991–995.
51. Zhao, N., Hong, J., & Lau, K. H. (2023). Impact of supply chain digitalization on supply chain resilience and performance: A multi-mediation model. *International Journal of Production Economics, 259*, 108817.