



Strategic Management of Supply Chain Disruptions: A Resilience Perspective

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Supply chain disruptions, resilience, strategic management, risk mitigation, redundancy, digital technologies, collaboration, and sustainability

ABSTRACT

The global supply chain structure has become more susceptible to disruptions from natural disasters, geopolitical tensions, and unforeseen events like pandemics. This article examines the strategic management of supply chain disruptions from a resilience perspective, emphasizing proactive measures, technological integration, and collaborative tactics. A quantitative method was used, using convenience sampling with a sample size of 150 participants, including supply chain managers and industry experts. Data was collected using standardized questionnaires and analyzed to discern patterns and correlations in resilience tactics. Crucial findings emphasize the need of redundancy, variety, and digital technologies, such as block chain and predictive analytics, in strengthening supply chain resilience. The study underscores the need for collaboration among stakeholders and the connection of resilience plans with business goals to achieve sustainable development. Practical implications provide concrete strategies for businesses to improve their supply chain resilience, while theoretical contributions enrich existing research by integrating resilience methodologies into supply chain management. The research analyzes shortcomings in proactive resilience measures and the influence of emerging technologies, providing a thorough framework for managing disruptions in an uncertain global environment.....

1. INTRODUCTION

Natural disasters, geopolitical conflicts, and unforeseen pandemics have become more prone to disruptions as global supply.



chains have become more intricate. For firms aiming to ensure operational continuity, reduce financial losses, and protect their reputation, the strategic management of supply chain disruptions has become essential. Resilience, defined as the capacity of supply networks to foresee, adjust to, and recuperate from interruptions, provides a robust basis for tackling these difficulties. This article examines the instruments, methodologies, and regulations that companies may use to alleviate risks and maintain sustainability while strategically managing supply chain disruptions using a resilience framework. The study underscores the need :

of collaborative strategies, proactive measures, and technological integration to bolster the resilience of the supply chain in an uncertain global landscape. Supply chain disruptions are not novel; but, their incidence, severity, and effect have markedly intensified. The susceptibility of supply chains to interruptions has been intensified by the globalization of trade, economic interdependence, and just-in-time production practices. The need of efficient supply chain management solutions has been highlighted by occurrences like as the COVID-19 pandemic, trade conflicts, and natural catastrophes. Resilience has been increasingly highlighted by scholars and practitioners as an essential factor in alleviating the negative impacts of disruptions. This study enhances the current literature by providing a comprehensive examination of resilience techniques, including diversification, redundancy, digitalization, and risk-sharing agreements. This study analyzes the correlation between resilience and successful supply chain management, offering organizations critical insights for navigating volatility and disruption.

Figure: 01



2. REVIEW OF LITERATURE

Shekarian and Mellat Parast (2021) examined the risks that supply networks encounter from both internal and external causes, including economic swings, natural catastrophes, and technology advancements. The essay underscores the essential need of resilience in supply chain management, particularly for sustaining operational continuity during disturbances. The study classifies the literature on risk and resilience into six principal themes: risk identification, risk assessment, mitigation techniques, and recovery planning. The authors contend that conventional risk management

strategies are often reactive, concentrating on recognizing risks and alleviating their impacts after a disruption occurs. Conversely, resilience management beyond basic risk management, seeking to improve the supply chain's capacity to foresee, withstand, adjust to, and recuperate from interruptions. The paper emphasizes the significance of incorporating risk and resilience techniques into supply chain design. The research highlighted the significance of technology advancements, including real-time data monitoring and predictive analytics, in enhancing the early identification of possible threats and facilitating preventative measures. Moreover, they emphasize the need for cooperation and information exchange among many stakeholders within the supply chain, which is crucial for improving overall resilience. The authors note that despite considerable advancements in comprehending and controlling supply chain risks, a gap persists in practical applications, necessitating future study to create more integrative and dynamic frameworks. The evaluation advocates for a comprehensive strategy that integrates risk management and resilience skills to create supply chains that are more resilient and adaptable to disturbances. Shekarian and Mellat Parast (2021) synthesized current research on risk management in supply chains, focusing on resilience, defined as the ability to predict, absorb, adapt to, and recover from disturbances. The study underscores that resilience management is proactive, aiming to integrate agility, redundancy, and flexibility into supply chain systems, as opposed to traditional risk management approaches, which are reactive.

Research Gap

Notwithstanding comprehensive research on resilience and supply chain management, some gaps remain. There is an absence of empirical studies evaluating the actual use of resilience strategies across diverse enterprises. Secondly, the majority of research prioritizes reactionary measures over proactive ways for mitigating disruptions. The impact of contemporary technology, such as block chain and artificial intelligence, on the robustness of supply chains has not been well investigated. This work aims to rectify these deficiencies by a comprehensive analysis that integrates empirical data with theoretical perspectives. This research improves the understanding of how firms might develop resilient and adaptable supply chains by examining resilience strategies across different sectors and investigating the impact of technology progress.

Research Problem

Most firms have difficulties in executing effective resilience strategies, despite the growing acknowledgment of supply chain resilience as an essential element of strategic management. Contemporary research often overlooks the holistic incorporation of resilience within supply chain management, focusing instead on certain elements of resilience, such as risk assessment and recovery planning. Araz et al. (2020) primarily focused on the use of data analytics for operational risk management in supply chains. The authors examine the capacity of data-driven approaches to alleviate, assess, and recognize risks in supply chain operations. The research suggests that organizations may enhance their decision-making and navigate uncertainties by using sophisticated analytical methods, such as real-time data surveillance and predictive modeling. The report highlights many case studies where data analytics were successfully used to improve supply chain efficiency and reduce risks. It underscores the growing importance of analytics in managing operational risks and achieving resilience in modern supply chains. In industries where disruptions may lead to significant financial and reputational damage, it is essential to preserve resilient supply networks to guarantee business continuity. The study enhances existing understanding of supply chain resilience by pinpointing essential strategies that organizations can use to bolster their readiness and reaction to interruptions. Furthermore, it offers a framework for policymakers, industry leaders, and supply chain managers to enhance resilience at both organizational and systemic levels.

Methodology of Research

The study utilizes a quantitative approach to examine the strategic management of supply chain disruptions via the lens of resilience. A sample of 150 participants, including supply chain managers, logistics professionals, and industry experts from several sectors, is recruited using convenience sampling. Structured surveys are used to gather data, which is then examined using statistical techniques to assess the efficacy of critical resilience tactics in alleviating disruptions. The aim of the technique is to aggregate diverse viewpoints and provide actionable recommendations for improving supply chain resilience. The quantitative technique facilitates the detection of patterns and correlations that guide strategic decision-making, whilst convenience sampling guarantees accessibility and practicality.

Analysis and interpretation

Data analysis using one way ANOVA

Ali et al. (2017) conducted a comprehensive investigation of supply chain resilience by including many components into a concept mapping framework. The several elements that enhance supply chain resilience include risk management, flexibility, redundancy, and cooperation. The authors underscore the need of establishing a systematic framework that integrates these varied aspects cohesively. They suggest a concept mapping approach that allows practitioners to see the interconnections among various resilience variables, facilitating improved decision-making and plan formulation for supply chain management. The study seeks to provide both scholarly and practical perspectives on the systematic integration of resilience into supply chain systems. Amini and Li (2011) examined the structure of supply networks for the efficient dissemination of innovative goods. Their research presents a comprehensive optimization strategy aimed at reconciling several elements, including cost, lead time, and flexibility, in the architecture of supply chains to enable the seamless launch of new goods. The authors use mathematical models to enhance supply chain designs that effectively facilitate the prompt and efficient market distribution of newly produced items. Their results underscore the essential function of strategic supply chain design in expediting product diffusion and ensuring supply networks are attuned to the requirements of new product launches, while concurrently minimizing costs and operational risks.

Table 1

Difference in the perception of advanced technologies in enhancing supply chain resilience according to the level of age

Age	No. of Res	Mean	Std. Deviation	F value	P value
Young	39	17.7543	3.92058	4.231	0.011
Middle	52	18.1284	3.13158		
Old	59	19.6345	2.65373		
Total	150	18.1431	3.52134		

The table provides a comparison of perceptions of advanced technologies in enhancing supply chain resilience across different age groups (young, middle, and old). Young Group (39 participants): Mean = 17.7543, Standard Deviation = 3.92058 Middle Group (52 participants): Mean = 18.1284 Standard Deviation = 3.13158 Old Group (59 participants): Mean = 19.6345, Standard Deviation = 2.65373, **F value** = 4.231: This indicates a significant variation in the perception of advanced technologies across the age groups, suggesting that the perception differs depending on the age group. **P value** = 0.011: Since this value is below the commonly used significance level of 0.05, it suggests that the differences in perceptions across age groups are statistically significant. The analysis indicates that the perception of advanced technologies in enhancing supply chain resilience varies significantly among the age groups, with older participants having the highest mean score, followed by the middle and young groups. This suggests that older individuals might have a more positive or more confident perception of these technologies compared to younger participants. The evolving notion of supply chain resilience and its significance in disruption management. The authors characterize supply chain resilience as the ability of a supply chain to adjust to and recuperate from disturbances while preserving or swiftly reinstating essential activities. They emphasize that resilience encompasses not just reacting to disruptions but also strengthening the system's capacity to endure disturbances and foresee prospective hazards. The essay examines many factors, such as robustness, agility, flexibility, and redundancy, to provide a complete framework for understanding resilience. In the event of a system failure, redundancy offers alternative solutions, while agility enables swift reactions to unexpected situations. These traits together form the foundation of a robust supply chain. The authors assert that traditional supply chain management strategies often emphasize cost reduction and efficiency, sometimes compromising resilience. They recommend that firms adopt a more holistic approach that integrates resilience into their supply chain strategies. In doing so, businesses can more effectively withstand unforeseen disruptions, such as natural disasters, economic crises, or supplier failures, without experiencing significant operational interruptions. The significance of proactive risk management, which involves the continuous appraisal of risks and the creation of contingency plans. To conclude, the article emphasizes the necessity for

organizations to transition from supply chain strategies that are solely cost-driven to those that prioritize resilience, thereby guaranteeing long-term sustainability in a global market that is becoming more volatile.

Practical Implications

The report provides practical recommendations for organizations that are seeking to enhance their resilience capabilities. This encompasses the development of contingency plans to mitigate unforeseen disruptions, the promotion of cooperation with stakeholders, and the investment in state-of-the-art technology. The findings underscore the necessity of aligning resilience measures with organizational objectives and market dynamics in order to achieve sustainable development. These insights may be employed by policymakers and business executives to develop policies and frameworks that support resilient supply chains on a systemic level. The introduction of digital technologies, including as predictive analytics, block chain, and the Internet of Things (IoT), may enhance the visibility, traceability, and decision-making capabilities of the supply chain. To alleviate the risks linked to dependence on a single supplier, firms must diversify their supply chain and provide redundancy. The firm's readiness and responsiveness to disruptions may be enhanced by fostering a culture of resilience via employee training and the encouragement of adaptive thinking.

3. CONCLUSION

The strategic management of supply chain disruptions is critical for maintaining operational resilience and ensuring long-term sustainability in today's dynamic global market. Companies must adopt proactive strategies such as diversifying suppliers, enhancing visibility through technology, and building stronger relationships with key partners to mitigate the impact of disruptions. Moreover, developing agile and flexible supply chain systems, along with investing in risk management frameworks, is essential for quick adaptation during crises. By focusing on these strategic elements, organizations can not only navigate disruptions effectively but also turn them into opportunities for innovation and improvement. It is imperative to address the challenges of a volatile and unpredictable global landscape by strategically managing supply chain disruptions from a resilience perspective. This study underscores the importance of resilience as a fundamental element of supply chain management, offering practical recommendations and insights for organizations that wish to enhance their resilience capabilities. Organizations that integrate resilience into their strategy may not only mitigate the consequences of disruptions but also establish a competitive advantage in the market. The findings underscore the necessity of a comprehensive strategy that encompasses proactive planning, technological advancements, and collaborative initiatives in order to establish supply chains that are both adaptable and resilient. The implementation of resilience solutions will continue to be a critical responsibility for enterprises in a variety of sectors as disruptions continue.

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