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STRENGTHENING GLOBAL SUPPLY CHAIN RESILIENCE IN THE FACE OF CRISES AND EXTERNAL DISTURBANCES

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Abstract

Strengthening the resilience of global supply chains is a critical aspect in coping with increasingly complex and frequent external crises and disruptions, such as pandemics, climate change, and political instability. Companies are required to implement proactive strategies such as the use of advanced technology and good risk management to improve visibility and speed of response to disruptions. In addition, supplier diversification and increased operational flexibility are required to reduce dependence on single sources and enable rapid adaptation to changes. Effective collaboration and communication with all stakeholders is also a determining factor in improving supply chain resilience. The implementation of these strategies is expected to create a supply chain that is more resilient, adaptive, and able to face various external challenges.

Keywords: Strengthening, Resilience, Global Supply Chain, Crisis and External Disruption

Introduction

Global supply chains are complex networks of processes and flows of goods and information involving many countries and companies. This interconnectivity creates significant economic value, increases production efficiency, and makes goods more affordable for consumers around the world. However, the complexity and interdependence of global supply chains also make them vulnerable to various crises and external disruptions (Inman et al., 2024).

Global supply chains are complex systems that involve multiple stages of production and distribution, often involving multiple countries as well as companies, and are therefore vulnerable to various external crises and disruptions. The high interdependence between each component of the supply chain means that a disruption to just one part can have a domino effect on the entire system (Arvis et al., 2024). The COVID-19 pandemic is a vivid illustration, where lockdowns and movement restrictions resulted in factory closures, transport delays, and uncertainty in market demand. As a result, a large number of goods became scarce, costs soared, and many companies were forced to temporarily or even permanently cease operations (Gaudenzi et al., 2023).

In addition to the pandemic, external factors such as geopolitical changes, trade wars, and natural disasters also exacerbate the vulnerability of global supply chains. Trade tensions between major countries and protectionist policies often lead to higher tariffs and trade restrictions, which can force companies to source alternative suppliers at additional costs. Natural disasters, which are becoming more frequent due to climate change, can damage infrastructure and disrupt logistics. All of this points to the importance of improving supply chain resilience and flexibility through source diversification, digital technologies, and international collaboration (Reynolds, 2024).

Recent years have witnessed a number of events that have dramatically disrupted global supply chains. The COVID-19 pandemic is the most obvious example, where factory closures, transport stoppages, and sudden changes in demand resulted in scarcity of goods and price spikes. In addition, trade tensions between major countries, natural disasters, and geopolitical issues have also affected the stability of global supply chains (Yamaji, 2020).

When a crisis like the pandemic hits, many companies are faced with great difficulties in maintaining business continuity. Inventory depletion, delivery delays, and imbalances between supply and demand are common problems. Companies that lack a strong risk management strategy often suffer huge losses, lose customer confidence, and even face the threat of bankruptcy (Akkucuk, 2022).

With awareness of the importance of supply chain resilience, many companies and governments around the world are beginning to recognise the need for strengthening strategies and implementing more adaptive policies. These efforts involve diversification of resources, use of digital technologies such as the Internet of Things (IoT) and big data analytics, and increased transparency and collaboration between stakeholders (Anbumozhi & Kim, 2020).

Strengthening supply chain resilience is also necessary to respond to the increasingly evident climate change. With the increasing frequency and intensity of natural disasters, such as floods, typhoons, and forest fires, companies must design more resilient and flexible supply chains. This includes business continuity planning, regular risk evaluation, and the ability to adjust operations quickly (Anbumozhi & Kimura, 2020).

Therefore, the importance of strengthening global supply chain resilience cannot be overstated. Companies and other stakeholders must work together to adopt proactive and innovative approaches in the face of external crises and disruptions. This research aims to explore various strategies and best practices in strengthening supply chain resilience, as well as provide policy recommendations to create a more resilient and sustainable supply chain system in the future.

Research Methods

The study in this research uses the literature method. The literature research method is a systematic approach used to collect, assess and analyse published information on a particular topic or phenomenon. This method involves steps such as identifying relevant sources, evaluating the credibility and validity of the information found, and collating and integrating findings from previous studies to develop a more comprehensive view or hypothesis (Sahar, 2008); (Arikunto;, 2000). Literature research is often used as a foundation for further research, as it helps researchers understand the existing theoretical and empirical context, discover gaps in knowledge, and inspire new research questions. In addition, by utilising various sources such as books, scientific journals, research reports, and articles, this method enables the acquisition of an in-depth and up-to-date understanding of the subject under study (Fadli, 2021).

Results and Discussion

Key Factors Affecting Supply Chain Resilience

Supply chain resilience is a measure of the extent to which a supply chain can respond to and recover from disruptions quickly and efficiently. There are several key factors that play an important role in determining supply chain resilience (Anbumozhi et al., 2020b).

Firstly, supplier diversification is an important element in improving supply chain resilience. Relying on one or only a few suppliers for critical raw materials or components can expose a company to great risk in the event of disruptions such as natural disasters, political issues, or financial failure of those suppliers. By diversifying suppliers, companies can minimise these risks and ensure operational continuity even when one supply chain is disrupted (Anbumozhi et al., 2020a).

Second, technology and information systems play a crucial role in strengthening resilience. The use of advanced technologies such as the Internet of Things (IoT), blockchain, and data analytics enables companies to monitor supply chains in real-time, identify potential disruptions early, and take corrective actions quickly. An integrated and reliable supply chain management system also helps in improving end-to-end visibility, facilitating effective communication, and optimising operational processes (Demirkıran, 2022).

Thirdly, effective inventory management greatly affects supply chain resilience. Holding excess inventory can be beneficial in disruption conditions, but it can also increase storage costs and the risk of shrinkage. Conversely, too little inventory can lead to shortages in the event of demand spikes or supply disruptions. Therefore, companies need to dynamically manage inventory to balance between cost and resilience, using strategies such as stockpiling strategic goods and implementing just-in-time inventory in more stable situations (Brennan, 2021).

Fourth, collaboration and partnerships between supply chain members are also crucial. A strong supply chain requires close co-operation between suppliers, manufacturers, distributors and retailers. Open communication and mutually beneficial co-operation can help in improving the collective response to disruptions. This involves transparently sharing risks, information and resources and working together to develop contingency plans and innovative solutions (Danner & Geske, 2022).

Finally, contingency planning and risk management are the backbone of supply chain resilience. Companies should be proactive in identifying potential risks and devising contingency plans that cover likely scenarios. This includes the development of disaster recovery plans, logistical backups, and training for employees on emergency procedures. By understanding and preparing for different types of risks, companies can better prepare for uncertainty and ensure business continuity (Ginn, 2024).

By integrating these key factors, companies can build supply chains that are more resilient, able to deal with disruptions, and maintain operations effectively, even under uncertain conditions.

Strategies to Strengthen Supply Chain Resilience

Strengthening supply chain resilience is an endeavour that requires a comprehensive range of strategies to ensure that operations continue smoothly despite disruptions. Here are some key strategies that can be implemented:

Firstly, the implementation of advanced technologies such as the Internet of Things (IoT), blockchain, and data analytics can greatly improve supply chain resilience. These technologies provide real-time visibility of the entire supply chain, allowing companies to monitor the movement of goods, identify potential disruptions early, and take mitigation measures quickly. In addition, the use of smart and integrated supply chain management systems helps in optimising operational processes and improving efficiency (Maheshwari & Jaggi, 2024).

Secondly, proactive risk management is an important step. Companies need to identify and categorise the risks in their supply chain, be it internal or external risks. Once the risks are identified, the next step is to develop contingency plans for each risk scenario. This includes having alternative suppliers, keeping safety stocks, and developing detailed emergency procedures. Regular scenario analysis and risk simulation can also help companies understand and prepare for various contingencies (Lotfi et al., 2023).

Third, supplier diversification is a crucial strategy to reduce dependence on one or a few suppliers. By having more suppliers in geographically different locations, companies can reduce the risk of supply disruptions caused by local factors such as natural disasters or political instability. In addition, supplier diversification also creates healthy competition that can improve quality and reduce costs (Reynolds, 2024).

Fourth, increasing operational flexibility is another effective measure. Companies that have the ability to adapt quickly to changes in demand or supply disruptions are more likely to maintain continuity of operations. This flexibility can be achieved through strategies such as dynamic inventory management, production capacity adjustment, and diversification of distribution channels. Using lean manufacturing and just-in-time (JIT) methods in stable environments, as well as safety stocks in less certain conditions, can also help improve resilience (Badiru, 2021).

Finally, strengthening collaboration and communication with all parties in the supply chain is essential. Supply chain resilience depends on how well companies communicate and co-operate with suppliers, distributors and customers. Developing strong, trust-based relationships with strategic suppliers, sharing data transparently, and coordinating contingency plans together can help improve the collective response to disruptions (Grzybowska & Stachowiak, 2022).

By implementing these strategies, companies can build more resilient and responsive supply chains, cope with different types of disruptions, and ensure better operational sustainability.

Conclusion

Strengthening the resilience of global supply chains is becoming increasingly crucial in the face of frequent and complex external crises and disruptions. With challenges such as global pandemics, climate change and political instability, companies must think proactively and take strategic measures to sustain their operations. The implementation of advanced technologies and proactive risk management are important foundations for achieving better visibility and response to potential disruptions.

Supplier diversification strategies and increased operational flexibility are other key elements in strengthening the supply chain. Diversification helps to reduce dependence on single sources that are prone to disruptions, while flexibility enables companies to adapt quickly to environmental changes. This ensures that companies can maintain continuity of service and product availability despite unexpected disruptions.

In addition, strong collaboration and effective communication with all stakeholders in the supply chain are also decisive factors in enhancing resilience. By building trust-based relationships and sharing information transparently, companies can work together to formulate effective and responsive contingency plans. These strategies, when properly implemented, will make global supply chains more resilient, adaptive and better able to navigate external challenges.

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