Global Supply Chain Resilience Strategies for Managing Operational Disruptions and Improving Business Continuity

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Received: 30 March 2026/Revised: 21 April 2026/Accepted: 08 June 2026/Published: 30 June 2026

Abstract

The current trend in global supply chains is vulnerability to disruptions caused by supplier failures, logistics constraints, geopolitics, natural disasters, diseases, and other risks such as market volatility. Some of these may influence production, stock availability, customer service, financial performance and even organizational stability. The current research seeks to explore the use of strategies for creating resilient global supply chains and business continuity. Supplier diversification, supplier collaboration, operational flexibility, logistics flexibility, risk preparedness and crisis management are some of the variables to be explored. In this respect, a quantitative research approach was adopted using a sample of 200 respondents from supply chain, procurement, logistics, operations, and business management departments. The results show that there is a high level of resilience practice, with supply chain resilience scoring a mean of 4.12, while business continuity scored 4.10. Collaboration among suppliers turned out to be the best resilience practice with a mean score of 4.18, followed by risk preparedness with a score of 4.15. It was also found in the analysis that there is a positive and strong connection between resilience of the supply chain and business continuity ($r = 0.82$, $p < 0.001$), whereas the regression analysis revealed that 67% of variance in business continuity is accounted for by resilience ($R^2 = 0.67$). Thus, it is clear that collaboration, preparedness, flexibility, and resilience planning are vital to maintain operational stability amid disruption. The current paper makes an important conclusion that resilience must be regarded as an ongoing strategic management process which enables rapid response, effective recovery, and better business continuity under global uncertainty.

Keywords: Supply Chain Resilience; Supply Chain Risk Management; Operational Disruptions; Business Continuity; Strategic Sourcing; Supplier Collaboration; Organizational Agility.

I. INTRODUCTION

1.1. Background of Global Supply Chain Management

Management of global supply chains is significant for connecting suppliers, manufacturers, distributors, logistics companies, and customers from various nations. The organization relies on the global supply chain for acquiring resources, manufacturing products, cost reductions, and customer services. However, due to the increasing complexity and interdependency of such supply chains, they have become more vulnerable to disruption (Guntuka et al., 2024).

Disruptions of one supplier, one logistics channel, or even one manufacturer will impact other processes in the supply chain process (Holgado & Niess, 2023). Thus, organizations should be concerned not only about efficiency but also about the stability of their processes (Silverman et al., 2023).

1.2. Operational Disruptions in Global Supply Chains

There can be various operational disturbances that can impact global supply chains, such as disturbances by suppliers, transportation, materials, labor, natural disturbances, geopolitical disturbances, and disturbances in customers' demands (Celestin & Sujatha, 2024). These disturbances may result in delays in production as well as deliveries and increase operating costs along with impacting customer satisfaction (Azadegan et al., 2020). Since activities related to supply chain management are linked, disturbances in one activity can result in disturbances in other activities as well (Dehghani Sadrabadi et al., 2024). Hence, organizations need appropriate strategies for identifying risks as well as responding to the disturbances (Sharma et al., 2021).

1.3. Importance of Supply Chain Resilience

Resilience in supply chains is the capability of organizations to be ready for any disruptions, react to them, and restore operations effectively (Steen et al., 2024). Resilience has become one of the critical priorities for managers since organizations cannot be fully protected from any risks related to global business activities (Riglietti et al., 2022). Supplier diversification, good relationships with suppliers, inventory planning, flexibility, and other measures can allow organizations to be less dependent on one source or one process (Namdar et al., 2021). Good resilience will enable organizations to continue their operations and adjust to changes in the business environment (Holgado & Niess, 2023).

1.4. Business Continuity Challenges

Business continuity is about the continuation of vital organizational processes during and after disruption (Suresh et al., 2020). Disruptions within the supply chain may pose problems to business continuity where the organization relies too much on certain suppliers, modes of transport, locations, or sources of materials (Azadegan et al., 2020). The managers should be able to keep these vital processes running, yet at the same time keep costs down. This is why contingency planning, communication, coordination, and recovery are critical during disruptions (Rochman, 2026; Dehghani Sadrabadi et al., 2024).

1.5. Problem Statement

Some of the challenges that have been faced by many companies with respect to the management of supply chain disruptions include the limited number of suppliers, poor contingency planning, operational rigidity, and lack of preparedness for risks. There is usually an emphasis on cost savings and efficiency in traditional approaches to supply chain management, but these aspects might not allow for flexibility during disruptions. Besides, resilience-related tasks might be managed separately within procurement, logistics, operations, and business continuity management departments. Thus, it becomes necessary to consider some of the approaches to integrated management of supply chain resilience.

Key Contributions

- Highlights major disruptions faced by organizations and analyzes their effect on the functioning of global supply chains.
- Analyzes some of the major strategies that help build organizational resilience, such as diversification of suppliers, collaboration, flexibility, and preparedness.
- Covers management aspects of building supply chain resilience and business continuity.

The paper is structured in this manner: Section 1 presents the background and purpose of the study. Section 2 includes a literature review. Section 3 discusses operational disruption and its consequences. Section 4 discusses supply chain resilience techniques. Section 5 discusses the methodology and results of the study. Section 6 includes the discussion of the results. Section 7 contains the conclusion of the study**.**

II. LITERATURE REVIEW

2.1. Supply Chain Resilience

A resilient supply chain is the ability of an organization to be prepared for disruptions, act efficiently when they occur, and restore its functioning (Steen et al., 2024). Flexibility, preparation, alternative sourcing, and coordination are among some of the activities that can make a supply chain resilient (Holgado & Niess, 2023). A resilient supply chain allows businesses to continue performing critical activities (Silverman et al., 2023).

2.2. Supply Chain Risk and Disruption Management

Supply chain risk management is concerned with the identification and management of the risks that could disrupt normal business operations (Azadegan et al., 2020). Some of the common risks include supplier failure, delays in transport, shortage of materials, fluctuations in demand, and other extraneous events (Celestin & Sujatha, 2024). Proper risk assessment and contingency plans could help businesses mitigate these disruptions (Dehghani Sadrabadi et al., 2024).

2.3. Business Continuity and Organizational Agility

The continuity of the business involves keeping critical business functions operating during disruption and resuming operations following an interruption (Suresh et al., 2020). Agility in the organization helps with this through its ability to adapt resources, processes, and decision-making in light of changes (Riglietti et al., 2022). Flexibility in operation, good communication, and planning for recovery may enable organizations to keep their customer service intact during disruptions (Guntuka et al., 2024; Azadegan et al., 2020).

2.4. Supplier Collaboration and Strategic Resilience

Collaboration among suppliers plays a critical role in the construction of resilient supply chains (Kaur et al., 2022). Good ties with suppliers may lead to better communication, exchange of information, coordination, and joint problem-solving when there are disturbances (Azadegan et al., 2020). Strategic activities such as diversification of suppliers, flexible sourcing, inventory management, and alternative logistics solutions help minimize vulnerability of the supply chain (Namdar et al., 2021; Sharma et al., 2021).

2.5. Research Gap

There has been research on topics related to resilience in the supply chain, risk management, business continuity, and collaboration among suppliers. However, very little research has been done regarding integrating all these elements into an effective management strategy that will help in dealing with disruptions in operations and maintaining business continuity. Hence, this study will explore how resilience strategies, supplier collaboration, organizational flexibility, and disruption preparation could be used together to improve global supply chain continuity.

III. OPERATIONAL DISRUPTIONS AND THEIR IMPACT ON GLOBAL SUPPLY CHAINS

3.1. Major Disruption Sources

Global supply chains may experience disruptions either internally or externally. Typical examples of such disruptions include supplier disruptions, transportation disruptions, lack of workforce, changing customers' demands, natural calamities, geopolitics, and uncertainty in the markets. All these disruptions may affect the flow of materials, products, information, and services. Therefore, it is important to analyze major disruption sources for proper identification of vulnerabilities and development of appropriate responses.

3.2. Supplier and Procurement Disruptions

Supplier and procurement disruptions may be associated with the shortages of materials, lack of capacity in the supplier organization, quality problems, financial troubles, or late deliveries. An organization that depends on a small number of suppliers may experience more difficulties if one of them fails to deliver goods. Proper supplier evaluation, multiple sourcing alternatives, good relations with suppliers, and constant communication are helpful in this case.

3.3. Logistics and Transportation Disruptions

Disruptions in the sphere of transportation and logistics may influence the transportation of raw materials, parts, and ready-to-ship products through the supply chain. They may consist of port congestion, transportation delays, routing disruptions, price fluctuations of fuel, and limited logistics capacity. An organization may minimize these obstacles through the development of alternative transportation possibilities and maintaining greater flexibility in distribution activities.

3.4. Geopolitical and Market-Related Risks

Geopolitical situation and the dynamics of the market could generate uncertainties for businesses that are operating within the international marketplace. Trade barriers, geopolitical conflicts, regulatory issues, tariffs, currency fluctuations, and sudden demand shifts are some of the factors that could influence the decisions on sourcing and logistics. Companies must be aware of their surroundings and be prepared to adjust their strategies accordingly.

3.5. Natural Disasters and Pandemic Disturbances

Natural calamities like floods, earthquakes, severe weather conditions, etc., could lead to disruption within the production process and logistics, damaging the production facilities and supplier's facilities, and creating disruptions within the production process. In the same way,

pandemics can disrupt the work availability, manufacturing process, logistics, and customer demand. This is a clear demonstration of the importance of being ready.

Table 1: Major Operational Disruptions and their Organizational Impacts

Operational Disruption	Examples	Major Impact
Supplier Disruptions	Material Shortages, Supplier Failure	Production Delays and Increased Procurement Costs
Logistics Disruptions	Port Congestion, Transportation Delays	Delivery Delays and Higher Logistics Costs
Geopolitical Risks	Trade Restrictions, Conflicts, Tariffs	Sourcing Difficulties and Market Uncertainty
Market Risks	Demand Fluctuations, Price Changes	Inventory Imbalance and Revenue Pressure
Natural Disasters	Floods, Earthquakes, Storms	Facility Damage and Supply Interruptions
Pandemic Disruptions	Workforce Shortages, Restrictions	Production and Distribution Interruptions

Summary of Disruptions within the Global Supply Chain and Their Organizational Effects is illustrated by table 1. The table shows how disruptions from suppliers, logistics, geopolitics, markets, natural calamities, and pandemics can result in production delays, cost increases, shortages of supplies, and continuity problems.

3.6. Impact on Organizational Performance and Business Continuity

Disruptions within the operational process can have a major impact on the performance of an organization through increased production costs, increased production delays, decreased product availability, and reduced customer satisfaction. Longer disruptions might have an impact on revenue, productivity, and relations with other organizations. Resilience and continuity techniques can assist an organization in mitigating the above impacts.

IV. SUPPLY CHAIN RESILIENCE STRATEGIES FOR BUSINESS CONTINUITY

4.1. Supplier Diversification and Collaborative Relationships

Supplier diversification decreases the reliance on a single supplier by creating several sourcing alternatives. Strategic collaboration with suppliers enhances communication, trust, information sharing, and problem-solving. Both approaches enable organizations to manage their material supplies and become ready to handle disruptions that arise from suppliers.

4.2. Inventories, Purchasing, and Flexibility

Efficient inventory control may give organizations additional time to cope with disruptions in the supply chain. The flexibility of purchasing and operations enables managers to change suppliers, the number of purchased items, scheduling, and allocation of resources depending on the changed situation. The proper balance between inventories and flexibility of operations may benefit organizations.

4.3. Logistics Flexibility and Risk Preparedness

Flexibility of logistics includes alternative transportation networks, logistics service providers, warehouses, and distribution networks. In addition, risk assessment and contingency planning help organizations identify potential risks and create alternative plans for handling these risks in advance.

4.4. Crisis Response, Recovery, and Business Continuity

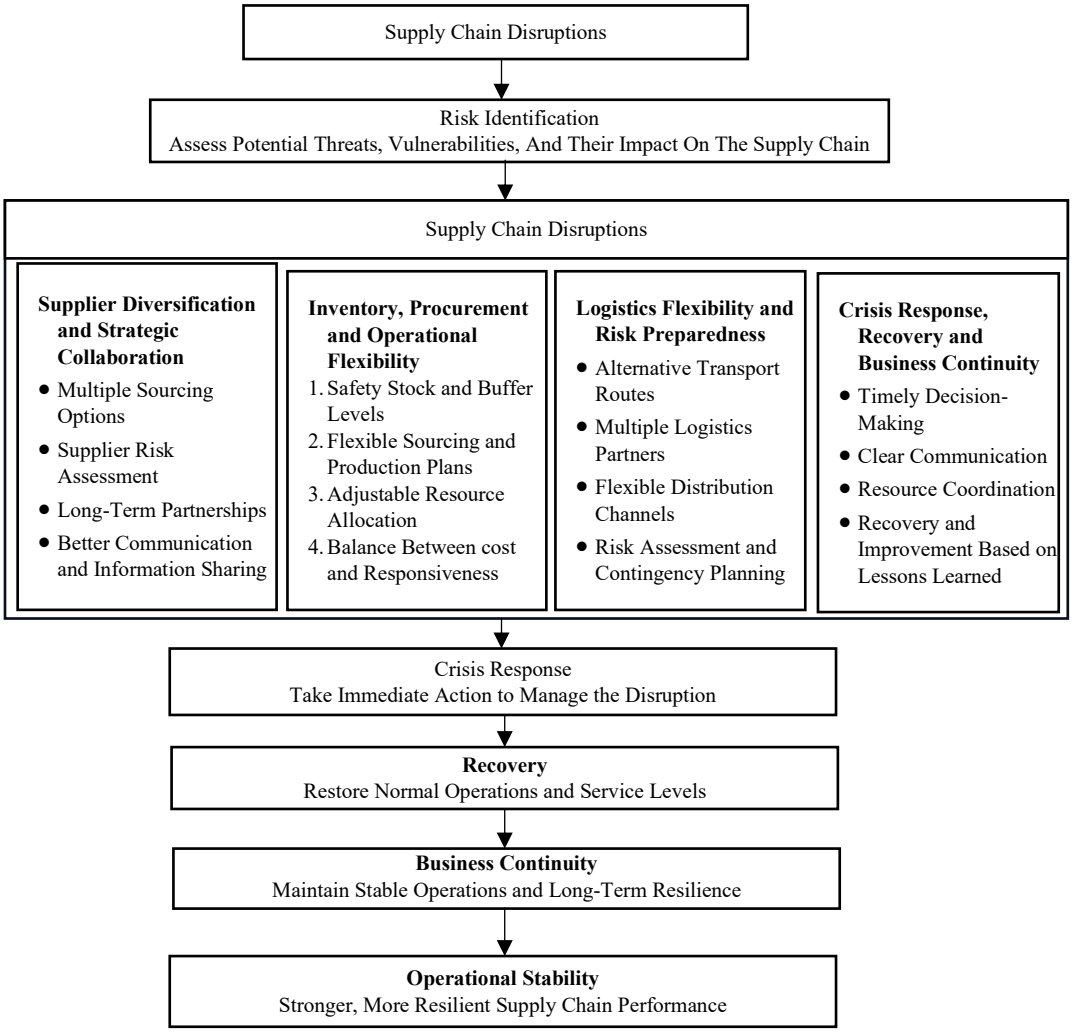

Figure 1: Conceptual Framework for Supply Chain Resilience and Business Continuity

Effective response to any crisis depends on efficient decision-making, proper communication, coordinating resources, and ensuring that critical operations receive priority. In case of a disruption, companies will need recovery plans to get back to their usual operations. Analysis of past disruptions and drawing useful lessons will also contribute significantly towards building resilience.

Figure 1 shows how a business can enhance its business continuity by incorporating supplier diversification, flexibility, logistics readiness, and risk management. Resilience strategies are important in managing any crisis and helping organizations achieve operational stability.

V. RESEARCH METHODOLOGY AND FINDINGS

5.1. Research Design

This study uses a quantitative research design to explore the role of supply chain resilience strategies in dealing with operational disruptions and ensuring business continuity. The study involves important management practices such as supplier diversification, supplier collaboration, flexibility of inventory and operations, logistics flexibility, risk preparedness, and crisis management. A questionnaire framework can be used to measure these management practices and their effect on business continuity. The research design creates a systematic method of exploring the relationship between supply chain resilience and business continuity.

5.2. Data Collection and Sample

For performing the empirical analysis, an illustrative data set of 200 respondents has been considered. The data set includes professionals having expertise in supply chain management, procurement, logistics, operations, and general business management. A structured questionnaire using a five-point Likert scale is used to capture the perception of supply chain resilience and business continuity practices by respondents. The illustrative data set is used to demonstrate the proposed analytical framework.

5.3. Research Variables and Measurement

Table 2 shows that Supply Chain Resilience will be the independent variable, while Business Continuity will be the dependent variable in the research study. The following is a description of Supply chain resilience, which comprises Supplier Diversification, Supplier Collaboration, Operational Flexibility, and Risk Preparedness. Business Continuity emphasizes operational stability, recovery capacity, and preparedness in conducting key operations in the event of disruption. The variables will be assessed using a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree.

Table 2: Research Variables

Variable	Main Dimensions	Scale
Supply Chain Resilience	Supplier diversification, collaboration, flexibility, risk preparedness	1–5
Business Continuity	Operational stability, recovery, continuity preparedness	1–5

5.4. Data Analysis Approach

The data will be analyzed based on the use of both descriptive and inferential statistics. The mean will help in analyzing the level of consensus on the various resilient practices, whereas the standard deviation will be utilized to analyze the variations in the answers. The correlation analysis method will be used to establish the relationship between supply chain resilience and business continuity. Further, the regression analysis method will be used to establish the contribution of supply chain resilience to business continuity.

5.5. *Findings on Supply Chain Resilience Strategies*

As seen from the results, a lot of importance is attributed to the application of resilience activities within the organizations captured within the illustrative data set. Supplier collaboration has the highest mean of 4.18, while risk preparedness has the second-highest mean of 4.15. Supplier diversification has a mean of 4.12, while crisis response has a mean of 4.11. The relatively high mean values for operational flexibility and logistics flexibility are 4.08 and 4.05, respectively.

The findings depicted in table 3 imply that supplier collaboration, preparedness for possible risks, and alternatives in the case of sourcing are key components of supply chain resilience. Relatively low standard deviation values suggest consistency of the responses within various aspects of resilience.

Table 3: Resilience Strategy Results

Strategy	Mean	SD
Supplier Diversification	4.12	0.58
Supplier Collaboration	4.18	0.55
Operational Flexibility	4.08	0.61
Logistics Flexibility	4.05	0.64
Risk Preparedness	4.15	0.57
Crisis Response	4.11	0.59

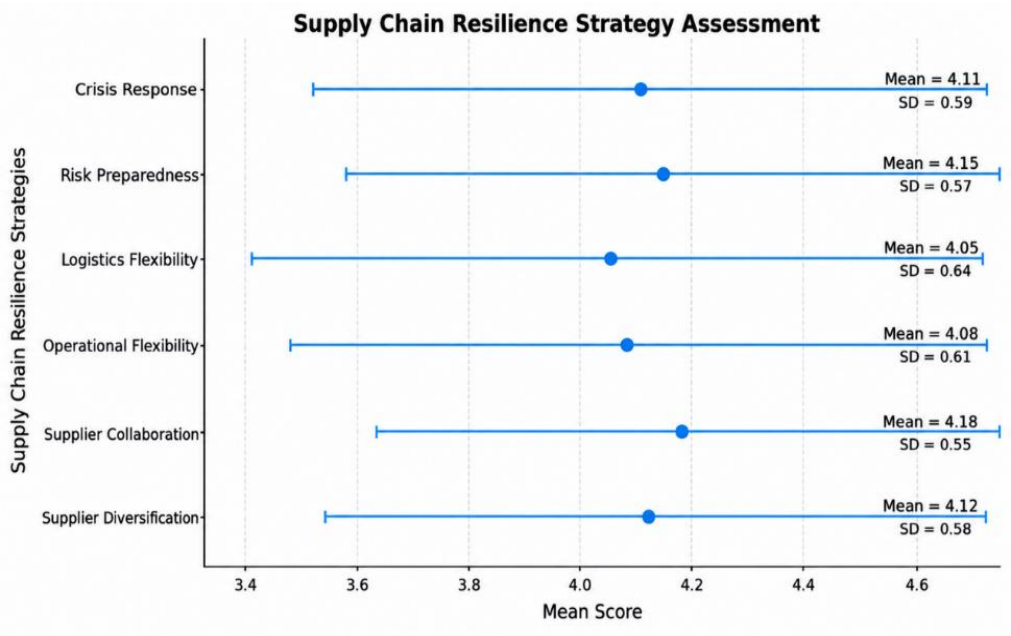

Figure 2: Supply Chain Resilience Strategy Assessment

Figure 2 illustrates the average scores and standard deviation of the different supply chain resilience strategies. The supplier collaboration strategy has the highest average score at 4.18, while the average scores of the other strategies are also relatively high.

5.6. Findings on Business Continuity

The results regarding business continuity reveal a positive evaluation across all measured aspects. Business continuity preparedness demonstrates the highest average score at 4.13, which highlights the significance of organizational preparedness for the continuation of vital processes under any disruption. Operational stability demonstrates an average score of 4.10, whereas critical operations maintenance achieves an average score of 4.09. Finally, the average score of the ability to recover reaches 4.06, which reveals that recovery management is also an integral part of business continuity.

In general, these results demonstrate that organizations with high levels of preparedness, operational stability, and recovery management are more capable of ensuring the continuation of vital processes in case of any supply chain disruption. In addition, the results confirm that business continuity should be considered as a continuing organizational task.

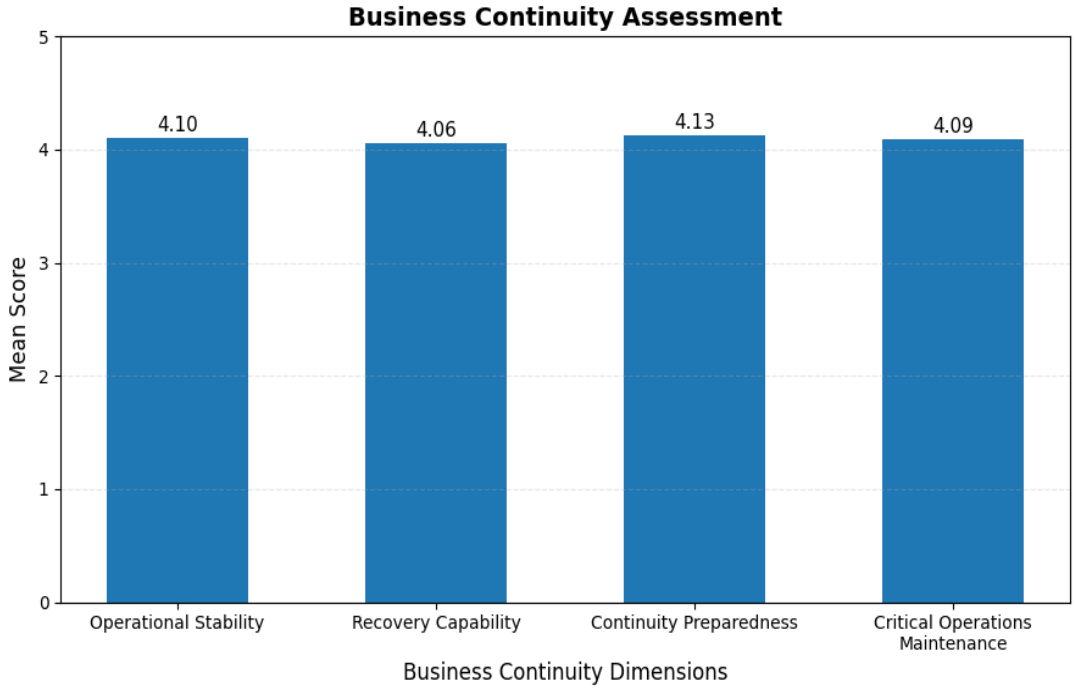

Figure 3: Business Continuity Assessment

Figure 3 shows the analysis of major business continuity dimensions. The scores reflect highly consistent means for all dimensions, which suggests high levels of preparedness, stability, resilience, and ability to continue core operations in case of disruptions in the supply chain.

5.7. Key Results

From the above illustration, we note that there is an average Supply Chain Resilience of 4.12 and an average Business Continuity of 4.10 in the considered data set. From the above illustration, we notice that there is a positive relationship between supply chain resilience and business continuity, with a correlation coefficient of $r = 0.82$ ($p < 0.001$). The regression analysis indicates that there is an explanation of about 67% of the variation in business continuity through supply chain resilience ($R^2 = 0.67$).

These results show that resilient practices have a major role to play in ensuring business continuity in case of any disruption. Specifically, collaborative efforts with suppliers, being prepared for risks, diversification of suppliers, operational flexibility, and crisis management contribute towards an organized effort in dealing with uncertainty. These findings help us understand the managerial implications discussed in the next section.

VI. DISCUSSION AND MANAGERIAL IMPLICATIONS

6.1. Discussion of Major Findings

This suggests that the application of supply chain resilience strategies is critical to handling disruptions within the organization and ensuring its continuity. The collaboration strategy scored the highest mean of 4.18, followed by risk preparedness with 4.15, while supplier diversification scored 4.12. The resilience strategy mean score of 4.12 and the business continuity mean score of 4.10 suggest high levels of agreement concerning the significance of these strategies. The positive correlation between resilience and business continuity suggests that effective resilience strategies are likely to yield higher continuity scores.

6.2. Resilience Strategies and Operational Stability

Findings show that diversification of suppliers, operational flexibility, logistic flexibility, and crisis management can be used to achieve greater operational stability in case of any disruptions. Organizations that have diversified suppliers and operational flexibility can change their operation strategies in case the regular suppliers and operation process are affected. In addition, logistic flexibility can ensure that there is no delay in material and product movement.

6.3. Resilience Strategies and Business Continuity

Supply chain resilience is directly related to the capability of organizations to carry out vital activities in case of any unforeseen disruption. The business continuity findings reveal that there is a high mean score on continuity preparedness, operational stability, and maintenance of critical operations. This implies that preparation and recovery planning are vital in ensuring that vital business activities continue. Organizational resilience should be integrated into business continuity planning to make organizations better prepared.

6.4. Importance of Organizational Agility and Collaboration

Organizational agility facilitates quick management action in case of changes in supply chain conditions. Flexibility, communication and coordination between suppliers, logistics partners and internal departments may allow quicker actions in case of operational issues. A high-rating on-supplier collaboration underlines the significance of good relations with supply chain partners as well. Collaboration allows improved communication and joint problem-solving during disruptive events.

6.5. Implications for Supply Chain Managers

The results imply that supply chain managers should take into account operational efficiency along with resilience and readiness. Managers should constantly assess supplier dependence, have appropriate alternatives, and contingency plans. Managers should cooperate with logistics partners and internal business units to make sure that important processes continue working

during disruption events. Therefore, resilience should be integrated into supply chain management practices.

6.6. Strategic Recommendations for Organizations

Organizations need to come up with a comprehensive resilience strategy that will involve such elements as supplier diversification, collaboration, flexibility, readiness for risks, and recovery planning. Risk assessments will enable organizations to determine the weak points in their operations prior to any disruption occurring. An organization can also conduct a review of past disruptions in order to plan better for contingencies in the future.

VII. CONCLUSION AND FUTURE RESEARCH

This study analyzed the significance of supply chain resilience measures in dealing with disruptions and ensuring business continuity within global supply chains. The main sources of disruptions under study includtableed supplier failures, logistics disruptions, geopolitical issues, market uncertainties, natural disasters, and pandemics. This study analyzed different supply chain resilience measures, which include supplier diversification, supplier collaboration, flexibility in operations, logistics flexibility, risk preparedness, and crisis management. These findings suggest that the practices mentioned above could help in sustaining operational stability and business continuity during disruptive events. Supplier collaboration had the highest mean value of 4.18, followed by risk preparedness of 4.15, and supplier diversification of 4.12. The mean value of supply chain resilience of 4.12 and business continuity of 4.10 further emphasizes the significance of resilience management practices within supply chains. The positive association between supply chain resilience and business continuity demonstrates the benefits of resilience measures in supply chain management. The research provides management insights in terms of the integration of both resilience and business continuity. Nevertheless, the research has some limitations due to the fact that it has been conducted on the basis of a sample and thus does not reflect the real situation. Future studies may consider verifying the suggested approach based on primary data from various organizations in different sectors and geographic locations. Moreover, future research may address disruptions within specific sectors, changes over time in companies' resilience capabilities, as well as the role of digital technologies, sustainability, and enhanced risk monitoring in increasing the resilience of supply chains.

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