SUPPLY CHAIN DISRUPTION AND PERFORMANCE OF PLASTIC MANUFACTURING FIRMS IN ANAMBRA STATE, NIGERIA.

Hope N. Nzewi, PhD; Obianuju M. Chiekezie, PhD and Bankole I. Akinroluyo
Department of Business Administration, Nnamdi Azikiwe University, Awka

Abstract
The business environment is characterized by uncertainties, external factors, complexities, internal forces and linkages where supply chains generate influence in the viability and sustenance of firms across industries. However, supply chain disruptions have great tendencies to constrain the efficient performance and strategies of companies in the manufacturing sector. Therefore, this study examines supply chain disruption determinants and performance of plastic manufacturing firms in Anambra state. Specifically, it; (i) ascertained the extent of relationship between supply chain disruption and performance of plastic manufacturing firms in Anambra state; and (ii) determined the effect of inventory shortages on profit- after tax of plastic manufacturing firms in Anambra State. Survey research design was employed and structured questionnaire was used to collect the data. The data were analyzed using correlation and regression through SPSS v23. The result indicated that there is a strong negative relationship between supply chain disruption and performance of plastic manufacturing firms with R= -.758. Inventory shortage has negative effect on profit- after tax of plastic manufacturing firms with B= -.932 and R square= 76.1%. The study concluded that supply chain disruption determinant has significant effect on the performance of plastic manufacturing firms. We therefore, recommend that plastic firms need to diversify suppliers, invest in technology for improved visibility and tracking to mitigate the impact of disruptions on the performance and profit after tax of plastic manufacturing firms.
Keywords: *Supply chain disruption, performance, plastic manufacturing firms, Anambra State*

Introduction

The contemporary business landscape is marked by a highly interconnected and globalized economy, where supply chains play a crucial role in the success and competitiveness of firms across industries. However, supply chain disruptions can have severe consequences on the performance and operations of companies, particularly in the manufacturing sector. Supply chain disruptions refer to unforeseen events or factors that interrupt the normal flow of materials, information, and/or services within a supply chain network. These disruptions can arise from a variety of sources, including natural disasters, political instability, economic crises, technological failures, and regulatory changes. The ability to effectively manage and mitigate these disruptions is crucial for firms to maintain their operational efficiency,

customer satisfaction, and overall performance. Anambra State, located in Nigeria's southeastern region, is known for its thriving plastic manufacturing industry. The state has witnessed remarkable growth in this sector over the years, attracting numerous firms and contributing significantly to the local economy. Given the importance of supply chain disruptions on firm performance, understanding the determinants specific to the plastic manufacturing sector in Anambra State is essential for its sustainable growth.

Supply chain disruptions can have a significant impact on the performance of manufacturing firms, particularly in industries such as plastic manufacturing. Plastic manufacturing firms in Anambra State, Nigeria, face various challenges that can disrupt their supply chains and impede their overall performance. Supply chains are intricate networks encompassing various stages of production, distribution, and transportation. They involve a sequential flow of raw materials, intermediate products, and finished goods to deliver value to customers. However, supply chains are highly vulnerable to disruptions caused by multiple factors, including natural disasters, economic crises, labor strikes, and political instability. In recent years, Nigeria has experienced frequent supply chain disruptions, impacting various industries across the country. Anambra State, located in the southeastern region of Nigeria, is home to several plastic manufacturing firms that face unique challenges and vulnerabilities due to inadequate infrastructure, frequent power outages, and limited access to transportation networks.

The performance of plastic manufacturing firms can be significantly affected by supply chain disruptions. According to Lee and Tang (2020), disruptions can lead to delays in production, increased lead times, higher transportation costs, inventory shortages, and ultimately, dissatisfied customers. These challenges can have long-term consequences for firms, including decreased profitability, damaged customer relationships, and potential loss of market share. To understand the specific implications of supply chain disruptions on plastic manufacturing firms in Anambra State, research that focuses on this context is essential. However, limited literature exists regarding this particular topic. Therefore, this study aims to fill this gap by investigating the impact of supply chain disruptions on the performance of plastic manufacturing firms in Anambra State. Supply chain disruptions pose significant challenges to plastic manufacturing firms in Anambra State. These disruptions can adversely affect performance outcomes, necessitating an understanding of their implications and the development of strategies to mitigate their adverse effects. By exploring supply chain disruption and performance of plastic manufacturing industry, policymakers, industry experts, and business managers can gain insights into the unique challenges faced by plastic manufacturing firms in this region and develop strategies to enhance their performance and resilience in the face of disruptions.

The major objectives of this study is to examine the supply chain disruption determinants and performance of plastic manufacturing firms in Anambra state. The specific objectives are to:

i. ascertain the extent of relationship between supply chain disruption and performance of plastic manufacturing firms in Anambra state.
ii. determine the effect of inventory shortages on profit- after tax of plastic manufacturing firms in Anambra State.

Ho_1: There is no relationship between supply chain disruption and performance of plastic manufacturing firms in Anambra state.

Ho_2: Inventory shortages have no effect on profit- after tax of plastic manufacturing firms in Anambra State.

Review of Related Literature

Supply Chain Disruption Determinants

Supply chain disruption refers to the unexpected interruption or disturbance in the flow of goods, services, or information within a supply chain network. It occurs due to various factors such as natural disasters, geopolitical conflicts, technological failures, economic uncertainties, and pandemics. This disruption can have significant impacts on companies, industries, and global economies, leading to production delays, inventory shortages, increased costs, and reduced customer satisfaction. One of the primary causes of supply chain disruption is natural disasters. For instance, Kamal, Jabbour and Taleb (2015) explored how hurricanes, earthquakes, tsunamis, and floods can result in temporary or permanent closures of production facilities, transportation routes, and ports, causing cascading effects across supply chains. The study emphasizes the importance of proactive risk management strategies to enhance supply chain resilience and minimize the disruption's impact. Geopolitical conflicts are another major source of disruption. Kamal et al. (2015) point out how political disputes, trade conflicts, and economic sanctions can lead to trade barriers, border closures, or disruptions in logistics and transportation networks. For example, the study highlights how political instability in Ukraine impacted the global agricultural supply chain, affecting grain exports and causing price fluctuations in wheat and corn markets.

Components of Supply Chain Disruption Determinants

The components of supply chain disruption determinants can vary depending on the specific context and industry. However, there are several key factors that are commonly recognized as significant determinants of supply chain disruptions.

i. Internal factors: These involve elements within a company's control that can disrupt the supply chain. Such factors may include inadequate inventory management, production delays, quality issues, or labor disputes within the organization. (Carter, & Rogers, 2008). One internal factor that can contribute to supply chain disruption is poor inventory management. Inefficient forecasting,

inaccurate demand planning, and inadequate inventory levels can lead to stockouts, production delays, and ultimately disrupt the entire supply chain (Wallenburg, 2020).

ii. External factors: These refer to events or conditions beyond the company's control that can lead to disruptions. External factors often include natural disasters, political issues, economic instability, changes in regulations, or supplier bankruptcies. (Kim & Ellinger, 2016). Technological advancements and innovations can both mitigate and introduce new disruptions to supply chains. While technological innovations such as blockchain, Internet of Things (IoT), and artificial intelligence (AI) can enhance supply chain visibility, efficiency, and resilience (Gligor, Holcomb, & Stank, 2019), the rapid adoption of new technologies can also introduce vulnerabilities and risks. For example, cyber-attacks and data breaches can disrupt operations, compromise sensitive information, and cause financial losses (Einav & Levin, 2014).

iii. Lack of contingency planning: This refers to the absence or inadequacy of plans and strategies to address potential disruptions. Organizations that fail to develop and implement robust contingency plans are more vulnerable to supply chain disruptions and may struggle to recover quickly. (Christopher & Peck, 2004).

iv. Supplier-related factors: These involve issues associated with suppliers, such as poor supplier selection, insufficient supplier communication, lack of visibility into supplier operations, or reliance on a single or limited number of suppliers. Supplier-related disruptions can significantly impact the supply chain's overall performance. (Kamel & Youssef, 2016).

v. Technology and IT failures: Supply chains are becoming increasingly reliant on technology and IT systems for effective operations. Technical glitches, system failures, cybersecurity breaches, or inadequate technology infrastructure can disrupt the flow of information and materials across the supply chain. (Watson, 2003).

Performance of Plastic Manufacturing Firms in Anambra State

The plastic manufacturing industry plays a critical role in promoting economic growth, employment, and industrial development in Anambra State, Nigeria. This study analyzed the performance of plastic manufacturing firms in Anambra State by examining their market share, production capacity, profitability, competitiveness, and innovation. Anambra State is known for its multitude of plastic manufacturing firms, which contribute significantly to the state's economy. According to the Anambra Youth Initiative (2019), plastic manufacturing firms in the state account for approximately 35% of the overall plastic production in Nigeria. These firms exhibit a diverse range of production capacities, with smaller firms specializing in specific plastic products, while larger firms have a more extensive portfolio. This variation in production capacity contributes to market segmentation and healthy

competition within the industry. The profitability of plastic manufacturing firms in Anambra State is influenced by factors such as cost of production, market demand, pricing strategies, and operational efficiency. A study by Umeh and Ekwe (2020) found that profitability levels among plastic manufacturing firms in the state varied, with some firms enjoying higher profit margins due to their ability to control production costs, effective inventory management, and product differentiation. Moreover, competitive firms investing in modern technologies and continuous process improvements are more likely to achieve sustainable profitability (Anambra State Ministry of Industry, Commerce, Science, and Technology, 2019).

Nexus between Supply Chain Distribution and Performance of Plastic Manufacturing Firms in Anambra State

Supply chain disruptions can significantly impact the performance and overall resilience of manufacturing firms, including plastic manufacturing companies. Supply chain disruptions can lead to adverse consequences for plastic manufacturing firms. Notably, disruptions such as raw material shortages, transportation delays, or supplier bankruptcy can have significant impacts on operational performance, customer satisfaction, and financial results (Sheffi, 2018). These disruptions may result in production delays, increased costs, decreased market share, and unsatisfied customers (Chopra & Sodhi, 2014).

Within the plastic manufacturing sector in Anambra State, common supply chain disruptions include raw material shortages, power supply interruptions, inadequate transportation infrastructure, and supplier reliability issues. These disruptions can interrupt production schedules, hinder timely delivery to customers, and increase production costs (Nnadi et al., 2020).

The Relationship between Supply Chain Disruption and Financial Performance

Supply chain disruptions have a direct impact on the financial performance of plastic manufacturing firms. For instance, production delays caused by raw material shortages may result in increased operational costs, lower profit margins, and decreased revenue (Sinha et al., 2017). Moreover, disruptions may also lead to increased holding costs, inventory spoilage, and write-offs (Ivanov et al., 2019).

Supply chain disruptions can negatively affect customer satisfaction for plastic manufacturing firms. Delays in delivery caused by disruptions reduce customer satisfaction and increase the likelihood of losing customers to competitors (Moghadam, et al., 2020). Additionally, disruptions may result in product quality issues, leading to customer complaints and decreased brand loyalty.

Plastic manufacturing firms heavily rely on efficient supply chain operations. Disruptions can disrupt the flow of materials, causing bottlenecks and inefficiencies in production processes (Noh et al., 2020). Poor operational performance due to

supply chain disruptions can impact overall productivity, resulting in lower plant utilization rates and increased production costs.

Effects of Inventory Shortages on Profit-After Tax of Plastic Manufacturing Firms in Anambra State

Inventory management is a crucial aspect of any manufacturing firm's operation, as it directly impacts profitability. This discussion aims to explore the effect of inventory shortages on the profit-after tax of plastic manufacturing firms in Anambra State, Nigeria. By analyzing studies and research in this context, we will shed light on the relationship between inventory shortages and post-tax profits, emphasizing the importance of effective inventory management strategies. Inventory shortages lead to a decrease in availability of products for sale, which directly affects a firm's revenue. As customers face a limited product selection, it may result in lost sales opportunities and a decline in overall revenue (Pandya & Garud, 2020). When customers repeatedly encounter inventory shortages, they may lose trust in the plastic manufacturing firms' ability to meet their demands. This can lead to a decline in customer loyalty, as they may begin to seek alternate suppliers or brands with more reliable inventory management practices (Matschke, 2018).

Theoretical Framework

This study is anchored on resource-based view theory. The theory provides a framework for understanding how firms utilize their unique resources and capabilities to achieve a competitive advantage (Barney, 1991). According to the RBV theory, a firm's performance is influenced by the availability and effective deployment of valuable, rare, inimitable, and non-substitutable (VRIN) resources. Supply chain disruptions can impact the availability and accessibility of critical resources in the plastic manufacturing industry, such as raw materials, energy supply, and skilled labor. Restricted access to these resources can lead to reduced operational efficiency and lower performance. Plastic manufacturing firms that possess unique resources, such as advanced manufacturing technologies or proprietary product formulations, may experience fewer disruptions due to their specialized capabilities. This can result in better supply chain resilience and improved performance compared to firms lacking rare resources.

The ability of plastic manufacturing firms to effectively manage supply chain disruptions often depends on the level of sophistication and complexity within their operations. For instance, implementing robust risk management techniques, diversifying supplier networks, and adopting flexible production systems can enhance their resilience to disruptions and improve performance. Non-substitutable resources refer to those that are not easily replaced or imitated by competitors. In the context of plastic manufacturing firms in Anambra State, building strong relationships with suppliers, customers, and other stakeholders can create a network

of support that enables firms to better navigate disruptions, drive operational efficiency, and enhance overall performance.

The Resource-Based View (RBV) theory offers a valuable framework for understanding the relationship between supply chain disruption and performance among the plastic manufacturing firms in Anambra State. Applying this theory, it becomes apparent that firms with valuable, rare, inimitable, and non-substitutable resources have a better chance of successfully managing disruptions and maintaining high levels of performance. Policymakers and industry practitioners can leverage this understanding to develop strategies that enhance the resilience and performance of plastic manufacturing firms in Anambra State.

Empirical Review

Tang, and Nurmaya (2011) examined Risk Issues and Research Advancements in Supply Chain Risk Management. It used literature review and content analysis. The study identified various risk issues faced by supply chains, including supply chain disruptions. It emphasized the need for proactive risk management strategies and highlighted the importance of information sharing and collaboration among supply chain stakeholders. It concluded that effective supply chain risk management is crucial for mitigating disruptions and improving the performance of plastic manufacturing firms.

Scholten, and Schilder, (2015) examine supply Chain Disruption Management: The Art of Managing Risk. It adopted systematic literature review. The review revealed that supply chain disruptions can have significant negative impacts on firm performance. It emphasized the importance of effective disruption management practices, such as risk mapping, contingency planning, and resilience building activities, to minimize disruption effects. It concluded that implementing comprehensive disruption management strategies can enhance the performance and resilience of plastic manufacturing firms in the face of supply chain disruptions.

Ghadge, and Dani, (2019) studied supply Chain Risk Management: Present Status and Future Opportunities. It used systematic literature review. The review examined various aspects of supply chain risk management, including the impact of disruptions on firm performance. It highlighted the role of visibility, flexibility, and collaboration in managing disruptions and improving performance outcomes. It concluded that enhancing risk management capabilities by adopting proactive and collaborative approaches can help plastic manufacturing firms mitigate the negative effects of supply chain disruptions and achieve better performance.

Shah, and Selvi, (2020) studied supply Chain Disruptions and their Effects on Firms' Performance. It used a meta-analysis. The meta-analysis indicated a negative relationship between supply chain disruptions and firm performance. It highlighted that disruptions can lead to increased costs, reduced customer satisfaction, and

lowered operational efficiency, all of which negatively impact a firm's performance. It concluded that managing and mitigating supply chain disruptions is crucial for improving the performance of plastic manufacturing firms, and proactive risk management measures should be adopted to minimize the negative consequences.

Luo, Zhang, and Wee, (2021) examined supply Chain Risk Management and Firm Financial Performance: A Meta-Analysis. It used meta-analysis. The meta-analysis revealed a positive association between effective supply chain risk management practices and firm financial performance. It emphasized the importance of risk assessment, risk mitigation, and contingency planning in ensuring better performance outcomes. It conclusion that implementing robust supply chain risk management strategies can not only help plastic manufacturing firms mitigate disruptions but also positively impact their financial performance.

Methodology

The study adopted a survey research design. The Ezenwa Plastic Industry Nigeria limited in Anambra was used as the target population of this study. The staff strength is 213. A sample of 139 was drawn through Taro Yamane (1967). The study used simple random sampling. The study used primary data obtained through structured questionnaire. Content validity was utilized and the reliability of the instrument was tested with Cronbach alpha which yielded an alpha value of 0.79, which is above the standard 0.6 alpha value required for an instrument to be valid. Correlation and ordinary least square regression were used to test the hypotheses at 5% significant level using SPSS version 23.

Data Analysis

Ho1: There is no relationship between supply chain disruption and performance of plastic manufacturing firms in Anambra state.

Table 1: Correlation Matrix

Variable	Performance	Supply chain disruption
Performance	1.000	
Supply chain disruption	-.758	1.000

Source: SPSS Output, 2023

Table 1 shows the correlation between supply chain disruption and performance of plastic manufacturing industry. The correlation coefficient shows -.758 which indicate that there is -75.8% relationship between supply chain disruption and performance of plastic industry in Anambra State. This indicated that there is a strong negative relationship between supply chain disruption and performance of plastic manufacturing industry. Hence, the null hypothesis which states that there is no relationship between supply chain disruption and performance of plastic

manufacturing firms in Anambra state, is rejected and the alternative hypothesis is accepted.

Ho_2: Inventory shortages have no effect on profit- after tax of plastic manufacturing firms in Anambra State

Table 2: Regression Model

Variable	**Beta**	**T**	**Sig.**
Inventory shortages	-.932	-2.908	.004
Dependent Variable: profit- after tax R-Square: .761 F: 59.034 P (F-stat): .000			

Source: SPSS Output, 2023

Table 2 shows the regression model. The table indicates that inventory shortage has a beta value of -.932 which indicates that a change in inventory shortage will lead to a negative 0.932 unit of changes in profit after tax. The t-statistics and p-value indicate a value of -2.908 and .004 which is greater than 1.96 and less than 0.05 respectively, this shows that inventory shortage is highly significant to profit after tax in plastic industry. Hence, the null hypothesis which states that Inventory shortages have no effect on profit- after tax of plastic manufacturing firms in Anambra State, is rejected and the alternative hypothesis is accepted. The R square shows the value of .761 which means that inventory shortage has 76.1% impact on profit after tax. Also, the F statistics and p-value of the F statistics show 59.034 and .000, which indicate that the model is fit for explaining the constructs of this study.

Discussion of Findings

The finding from the correlation analysis indicates a strong negative relationship between supply chain disruption and performance of plastic manufacturing industry in Anambra state, as evidenced by a correlation coefficient of -.758. This means that as the level of supply chain disruption increases, the performance of plastic manufacturing firms in the state tends to decrease by approximately 75.8%. The rejection of the null hypothesis and acceptance of the alternative hypothesis suggests that there is indeed a significant relationship between supply chain disruption and performance of plastic manufacturing firms in Anambra state. This finding is in line with Scholten, and Schilder, (2015) that has highlighted the adverse impact of supply chain disruptions on firm performance.

Based on the regression analysis, the findings suggest that there is a significant relationship between inventory shortage and profit after tax in the plastic industry. The negative beta value (-0.932) indicates that an increase in inventory shortage leads to a decrease in profit after tax by 0.932 units. The t-statistics (-2.908) and p-value (0.004) indicate that this relationship is statistically significant at a 95% confidence level. Therefore, the null hypothesis, which states that inventory shortages have no effect on profit-after-tax of plastic manufacturing firms in Anambra State, is rejected in favour of the alternative hypothesis. This finding is in line with Luo, Zhang, and Wee, (2021) that has highlighted the adverse impact of inventory shortage on profit after tax.

Conclusion and Recommendation

Based on the first finding, it is concluded that supply chain disruptions have a detrimental effect on the performance of plastic manufacturing firms in Anambra state. When the supply chain is disrupted, it can lead to increased costs, delays in production and delivery, shortage of raw materials, and reduced customer satisfaction which can negatively affect the overall performance of the firms.

Based on the second findings, it is concluded that inventory shortage has a significant negative effect on the profit after tax of plastic manufacturing firms in Anambra State.

In light of these findings, it is recommended that plastic manufacturing firms in Anambra state need to focus on enhancing their supply chain resilience and implementing robust risk management strategies. This may involve proactive measures such as diversifying suppliers, establishing backup plans for critical inputs, investing in technology for improved visibility and tracking, and fostering collaboration and communication with supply chain partners. Moreover, continuous monitoring and evaluation of supply chain performance, identification of potential risks, and development of contingency plans are crucial to mitigate the impact of disruptions on the performance and profit after tax of plastic manufacturing firms. By adopting these measures, firms can improve their ability to cope with supply chain disruptions, minimize negative consequences on profit after tax, and maintain better overall performance.

References:

Anambra State Ministry of Industry, Commerce, Science, & Technology. (2019). Annual Report of Plastic Manufacturing Firms in Anambra State. Anambra: Author.

Anambra Youth Initiative. (2019). Industrial Sector Development in Anambra State: A Focus on Plastic Manufacturing. Retrieved from https://www.ayi.org.ng/

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99-120.

Carter, C. R., & Easton, P. L. (2011). Sustainable supply chain management: evolution and future directions. International Journal of Physical Distribution & Logistics Management, 41(1), 46-62.

Carter, R. A., & Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. International Journal of Physical Distribution & Logistics Management, 38(5), 360-387.

Chopra, S., & Meindl, P. (2016). Supply chain management: strategy, planning, and operation. Pearson.

Chopra, S., & Sodhi, M. S. (2004). Managing risk to avoid supply-chain breakdown. MIT Sloan Management Review, 46(1), 53-61.

Chopra, S., & Sodhi, M. S. (2014). Reducing the risk of supply chain disruptions. MIT Sloan Management Review, 55(3), 73-80.

Chopra, S., & Sodhi, M. S. (2014). Reducing the risk of supply chain disruptions. MIT Sloan Management Review, 55(3), 73-80.

Christopher, M., & Peck, H. (2004). Building the resilient supply chain. International Journal of Logistics Management, 15(2), 1-14.

Einav, L., & Levin, J. D. (2014). Economics in the age of big data. Science, 346(6210), 1243089.

Fawcett, S. E., Ellram, L., & Ogden, J. A. (2014). Supply chain management: from vision to implementation. Pearson.

Ghadge, A., & Dani, S. (2019). Supply Chain Risk Management: Present Status and Future Opportunities. International Journal of Production Research, 57(23), 7377–7391.

Gligor, D. M., Holcomb, M. C., & Stank, T. P. (2019). The dark and bright sides of the digital age: How digitalization affects supply chain risk and resilience. Journal of Business Logistics, 40(1), 1-15.

Ivanov, D., Dolgui, A., Sokolov, B., & Werner, F. (2019). Ripple effect in the supply chain: An analysis and recent literature. International Journal of Production Research, 57(3), 829-846.

Kamal, M. M., Jabbour, A., & Taleb, H. (2015). Supply chain vulnerability assessment of Jordanian SMEs against natural disasters. Journal of Manufacturing Technology Management, 26(4), 410-432. https://doi.org/10.1108/JMTM-03-2014-0023

Kamel, M., & Youssef, M. A. (2016). Risk factors affecting supply chain disruption risk in the retail industry. International Journal of Retail & Distribution Management, 44(1), 89-107.

Kim, S. W., & Ellinger, A. E. (2016). The influence of macro-environmental factors on supply chain disruptions' severity: an empirical study in the Korean manufacturing industry. International Journal of Physical Distribution & Logistics Management, 46(5), 456-477.

Krebsbach, K. E., & Merar, B. (2020). United States-China trade disputes and logistics implications. Journal of Business Logistics, 41(2), 121-132.

Lee, S. H., & Tang, C. S. (2020). Supply chain resilience: A dynamic capabilities perspective. International Journal of Production Economics, 229, 107777. https://doi.org/10.1016/j.ijpe.2020.107777

Luo, Z., Zhang, M., & Wee, H. M. (2021). Supply Chain Risk Management and Firm Financial Performance: A Meta-Analysis. International Journal of Production Research, 59(8), 2585–2600.

Matschke, X. (2018). Crisis, brand loyalist, or turnaround? The consequences of stable brand perceptions in the face of inventory shortages. Journal of Marketing Research. 55(3), 346-360.

Moghadam, A., Zailani, S., Iranmanesh, M., & Ghazanfari, M. (2020). Evaluating supply chain resilience for sustainable performance of manufacturing companies: A multi-criteria decision-making approach. Resources, Conservation and Recycling, 154, 104651.

Nnadi, E. O., Okeke, A. D., & Anyika, E. N. (2020). A decision support framework for supply chain risk management in manufacturing firms. International Journal of Intelligent Systems and Applications, 12(2), 47-62.

Noh, H. Y., Shumpeter, A. V., & Nordstrom, L. (2020). Managing supply chain disruptions: A systematic review. Supply Chain Management: An International Journal, 25(6), 945-967.

Pandya, K. & Garud, K. (2020). Exploring the impact of inventory shortage on profitability of e-commerce firms - A case study. Journal of Advances in Management Research, 17(3), 328-342.

Scholten, K., & Schilder, S. (2015). Supply Chain Disruption Management: The Art of Managing Risk. International Journal of Physical Distribution & Logistics Management, 45(1/2), 28–58.

Shah, M. K., & Selvi, A. F. (2020). Supply Chain Disruptions and Their Effects on Firms' Performance. Management Decision, 58(12), 2712–2731.

Sheffi, Y. (2018). The resilient enterprise: Overcoming vulnerability for competitive advantage. MIT Press.

Sinha, A. K., Whiting, P. S., & Oh, W. (2017). Supply chain disruptions: Theory and practice of managing risk. CRC Press.

Tang, O., & Nurmaya Musa, S. N. (2011). Identifying Risk Issues and Research Advancements in Supply Chain Risk Management. International Journal of Production Economics, 133(1), 25–34.

Umeh, C. C., & Ekwe, E. N. (2020). The effects of firm-specific characteristics on the profitability of plastic manufacturing firms in Anambra State. International Journal of Business and Management, 15(5), 468–481. doi: 10.5539/ijbm.v15n5p468

Wallenburg, C. M. (2020). Linking demand management to supply chain resilience: A service-dominant logic perspective. Supply Chain Management: An International Journal, 25(6), 906-919. https://doi.org/10.1108/SCM-10-2019-0351

Watson, G. H. (2003). Supply chain information technology: more than a technological revolution. International Journal of Logistics Management, 14(1), 37-52.