THE IMPACT OF SUPPLY CHAIN DISRUPTIONS ON PRODUCT AVAILABILITY

JANICE MZUNGU KEMIGISHA

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Name..Kemigisha Janice Mzungu

APPROVAL

This research dissertation has been submitted to Uganda Christian University with my guidance as appointed University Supervisor.

Signed: _____ Date: 30/9/2024.

Mr. Percy MULOOSI

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ABSTRACT

This paper researches the effects of logistics disruption on product availability, as well as how firms can improve organizational resilience through their responses. As natural disasters, geopolitical instability, technological failures and exogenous economic downturn increasingly disrupt the global markets with growing frequency; supply chains are at greater risk than ever before. This research interprets both the impact of various disruptions on product availability and inventory management measures, as well as how demand-side determinants such market footprint performance influence resilience via SCM risk-mitigation practices. During the study, a model of mixed-method design was adopted whereby quantitative data from survey and industry reports will be included with qualitative insights obtained through case studies and interviews with supply chain professionals. Conclusions are relevant along contingency planning; risk management frameworks and strategic inventory mgmt. Researchers also highlight those technological adoptions like real-time monitoring and predictive analytics are necessary to enhance visibility of supply chains for better decision-making. Collaboration with supply chain partners and information sharing get to be vital components for forging more adaptable systems. Based on these parameters, the research suggests that businesses can address disruptions by establishing more proactive (rather than reactive) and flexible strategies such as increasing supplier diversification; risk-sharing agreements with suppliers or downstream customers; adapting advanced technologies within their operations. By adopting these strategies companies can improve supply chain efficiency, product availability and optimization of financial performance while catering to the requirements of customers. This research adds to the growing body of understanding to enable effective risk management in a turbulent global environment by providing critical guidance for Industry on how best their supply chain Risk Management practices can be undertaken.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter will present the background of the study, problem statement, study objectives, research questions, scope of the study i.e., content and geographical scope, significance of the study, and the conceptual framework.

1.2 Background of the study

As modern supply chains continue to be complex and interdependent, supply chain disruptions will only be more prominent in the future global economy. This is leading by Carvalho et al. (2012). Border flow of goods and services will continue being crucial while causing considerable operational and financial consequences. The earthquakes and hurricanes are going to continue to cause massive disruptions, as witnessed in the case of the 2011 Tōhoku earthquake in Japan-affecting not just Japanese automotive and electronics industries but also global ones. Therefore, such events will bring into the foreground highly robust risk management and disaster preparedness, much more so in view of the rise in frequency and intensity on account of climate change. Geopolitical tensions, such as trade wars and political instability, will also add considerably to supply chain disruption. In fact, the US-China trade war will bring friction in imposing tariffs and trade barriers that will force companies to reconsider their sourcing and production strategies. Political instability in key manufacturing regions will lead to disruptions in supply chains and the creation of long-term uncertainties. Businesses will need to decrease geopolitical risks by developing diversified supplier sources and increasing flexibility in response to regulatory changes. COVID-19 has shown the partial weakness of the international supply chains from health-related risks. Lockdown and labor shortages have been some of the unprecedented disruptions that expose one-point failures both in just-in-time inventory systems and reliance on single-source suppliers. Businesses, in turn, need to embed more flexibility and redundancy into their strategies on supply chains.

Supply chain disturbances will have far-reaching ramifications for business operations, consumer prices, and overall economic stability. The consequences will be an increase in costs, reduction in revenues, and loss of productivity. Policymakers and businesses will create plans that work toward making supply chains more resilient and having less

economic impact, such as investment in infrastructure and diversified sources of supply. Supply chain interruptions will continue to greatly impact product availability, which ranges from stockouts to consumer delays. It can occur at any point within the complicated network through which goods travel from raw materials to store shelves. Also, unexpected surges in demand or supplier-related difficulties will be able to render retailers with insufficient stock to meet customer needs. This consequently will usually lead to empty shelves, dissatisfied customers, and lost opportunities to make sales for the business. To address these issues, businesses will have to take action by diversifying sources of supply and applying technological solutions such as real-time monitoring systems and predictive analytics. Strategies of collaboration between suppliers and logisticians will have to be employed towards mutual risk management. Governments will also be key investors in infrastructural development and in the promotion of stable trade policies that will assure traders.

Supply chain disruption was a complicated issue that required comprehensive approaches and the interest of stakeholders. Firms would, therefore, be developing resilience in their supply chains and ensuring that flows of goods and services ran seamlessly in an increasingly interdependent world. The business would address natural, geopolitical, and technological risks and develop supply chain resilience, hence ensuring that the flow of goods and services would run well in an increasingly interdependent world.

1.3 Statement of the Problem

Supply chain disruptions cause high-magnitude problems of consistent product availability for industries around the world and ripple effects disturbing production schedules and increasing costs and denting customer confidence. On the other hand, notwithstanding strides made in big ways in supply chain management practices, including the use of sophisticated technologies and data analytics, many organizations fumbled in effectively anticipating and mitigating the impacts of such interruptions. Current research in the field mostly dwells on the general principles of supply chain risk management, but it also distinctly lacks detailed analyses about how certain disruptions will finally affect product availability across various industries. This gap was notably evident within a fast-changing global crisis-a pandemic, geopolitical tensions, and events related to climate change-that exposed the vulnerabilities of traditional supply chain models. There was also a general lack of empirical evidence on the effectiveness of various mitigation strategies that organizations had adopted to counteract these disruptions. This dissertation thus sought to

address these gaps in knowledge by exploring the specific effects of supply chain disruptions on product availability, ascertaining root causes, and testing the efficiency of different mitigation strategies. In a bid to seek an understanding of the dynamics at play in greater detail, this study has tried to combine qualitative and quantitative research methodologies so as to provide actionable insights that might help businesses in the development of more resilient supply chains. This study, therefore, had the objective of trying to fill that knowledge gap through a critical review which, instead of only pointing out the challenges, will offer practical solutions on how to minimize the negative impacts of supply chain disruption on product availability.

1.4 Purpose of the Study

The purpose of the study was to examine the impacts of supply chain disruptions on product availability.

1.5 The Specific Objectives

i. To quantify the impact of different types of supply chain disruptions on the availability.
ii. To evaluate the effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability for businesses.
iii. To analyse the role of supply chain risk management practices in enhancing the resilience of businesses to product availability disruptions.

1.6 Research Questions

i. What will be impacts of different supply chain disruptions on product availability for businesses?
ii. How would the effectiveness of inventory management strategies help in mitigating the impact of supply chain disruptions on product availability for businesses?
iii. What will be the role of supply chain management practices in enhancing resilience of business to product availability disruptions?

1.7 Scope of the Study

The study covered different areas which include; the content scope, time scope, and geographical scope.

1.7.1 Content Scope

The content scope of this study encompassed an in-depth analysis of the various factors that disrupt supply chains, including political instability, natural disasters, health crises, and logistical challenges. The study explored the nature and impacts of these disruptions on supply chain operations, economic stability, and growth. It delved into case studies and empirical data to provide a comprehensive understanding of the challenges faced by supply chains in today's globalized economy. Additionally, the study evaluated existing strategies and approaches for mitigating supply chain disruptions, focusing on resilience-building measures, risk management frameworks, and technological solutions. The research also examined the role of collaboration among supply chain stakeholders, government policies, and regulatory frameworks in enhancing supply chain resilience. Ultimately, the study also aimed to provide actionable recommendations for businesses and policymakers to develop more robust and adaptive supply chain management practices.

1.7.2 Time Scope

The study was conducted within four months running from June 2024 to September 2024, and it covered the period from 2017 to 2024.

1.7.3 Geographical Scope

The research has a global geographical scope concerning the disruptions of supply chains and implementation of resilience strategies across different regions and industries. It will draw lessons learned from varied geographical locations that have been impacted by political instability, natural disasters, health crises, and logistical challenges. Case studies and empirical data will be derived from various diverse continents, such as North America, Europe, Asia, Africa, and Oceania, for comprehensive and comparative research on disruptions to supply chains and their mitigation strategies. The intent was to provide insights applicable to a wide range of geographical contexts and allow for a holistic understanding of the supply chain resilience challenge at a global level.

1.8 Justifications of the Study

To the academic field, the current study will prove to be significantly useful for academicians and researchers of supply chain management and its associated logistics. By studying in depth the nature of disruptions in the supply chain due to political instability, natural disasters, health crises, and logistical problems, this research study will add to the

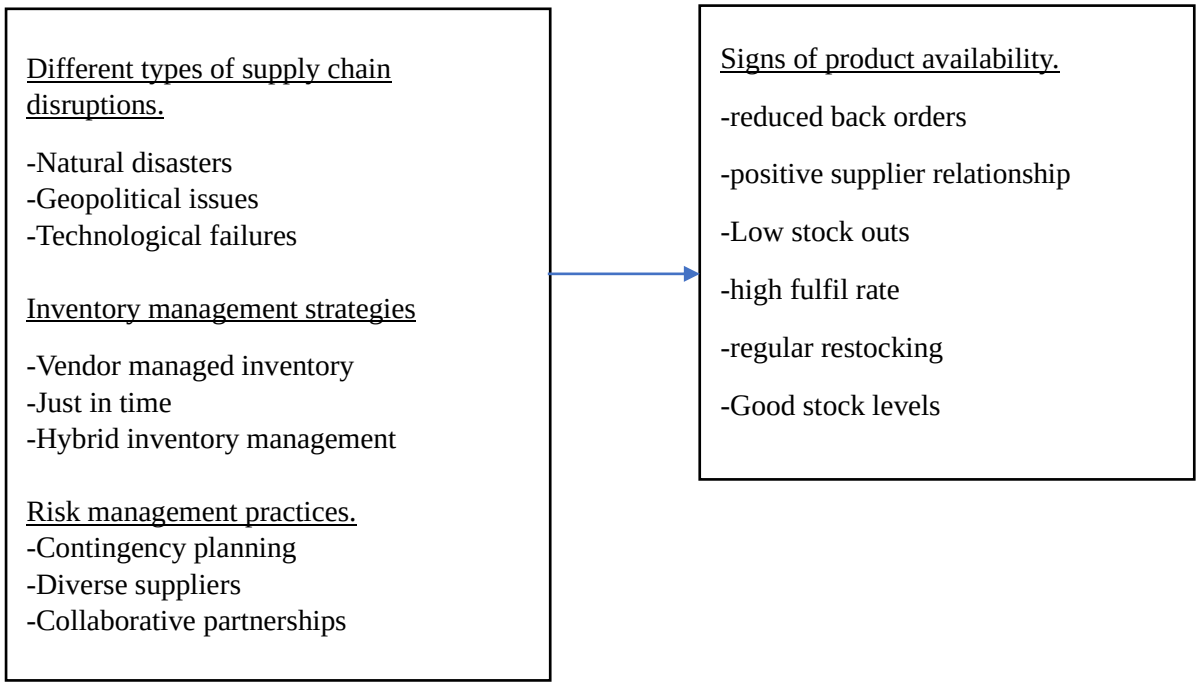
academic debate on the resilience of the supply chain. This will provide a platform for theoretical deliberation, empirical analysis, and the construction of new frameworks and methodologies in studying and dealing with disruptions in supply chains. Academics can further use the findings of the study to enhance teaching materials, on the basis of which new avenues of research can be pursued and explored, thereby contributing towards knowledge development in theory and practice related to supply chain resilience. Businesses: This would become highly significant to any business entity in the modern global world, where economies are interlinked, due to the varied aspects it provided on how the supply chains might be disrupted. By understanding the nature and impacts of various disruptive forces that include political unrest, natural calamities, health-related crises, and logistic issues, businesses would themselves take necessary effective strategic measures to ensure supply chain robustness. This, in turn, will enable organizations to reduce risk exposure, minimize incidents of operational disruption, and lower related costs of supply chain disruption and deliver to customers what they expect. Finally, this research will assist businesses through actionable recommendations to construct far stronger and more adaptable supply chain management practices.

To Governments and Policy Makers: This study will avail valuable insight into the critical role of supply chain resilience in economic stability and growth to policymakers and government agencies. By understanding how supply chain disruptions occur and the effectiveness of mitigation strategies, policymakers can develop well-informed policies and regulatory frameworks that facilitate business efforts toward enhancing supply chain resilience. This would be activities that enhance infrastructure, establish coordination among supply chain players, create emergency preparedness, and apply innovation in the management of supply chains. Finally, policy makers will use findings of this study to develop a favourable environment where supply chains are resilient, hence contributing to overall economic resilience.

This research contributes to supply chain professionals and industry associations by assisting them in gaining deeper insights into the challenges and opportunities related to the management of supply chain disruptions. The insights obtained will inform the decision-making processes within supply chain organizations on the creation of robust risk management strategies, contingency plans, and adoption of technologies to enhance supply chain resilience. These, in turn, will be used by industry associations to advocate the

promotion of best practices, standards, and collaborative initiatives that work toward supply chain resilience across industries. Hence, the study shall enable supply chain professionals and industry associations to function within the dynamics of supply chains not only effectively but also sustainably.

1.9 Conceptual Framework



The conceptual framework for this study provided a structured approach to understand and address supply chain disruptions while enhancing resilience. It categorized disruptions into four primary factors: natural disasters, political instability, health crises, and logistical challenges. These disruptions manifest in various impacts such as operational halts, financial losses, reputational damage, and economic fluctuations. To counter these disruptions, resilience strategies will be outlined, including risk management frameworks, diversification strategies (supplier, geographic, product), technology adoption for real-time monitoring, collaborative partnerships, and contingency planning. Enablers of resilience encompass data sharing, infrastructure development, supportive policies, organizational culture emphasizing adaptability, and talent development in risk management. The framework also identified outcomes and performance measures focusing on supply chain efficiency, financial effectiveness, customer satisfaction, and sustainability. Feedback mechanisms were also crucial, involving continuous monitoring, feedback gathering, learning from experiences, and

iterative improvement of resilience strategies. This comprehensive framework served as a guide for researchers and practitioners to analyse, develop, and implement effective strategies for managing supply chain disruptions and enhancing overall resilience in a dynamic business environment.

1.10 Definition of key terms and concepts

1. **Supply Chain Disruptions**: Events or incidents that interrupt the normal flow of goods, services, or information within a supply chain network, resulting in operational, financial, or reputational impacts. Examples include natural disasters, political instability, health crises, and logistical challenges.
2. **Resilience**: The ability of a supply chain to anticipate, respond to, recover from, and adapt to disruptions while maintaining essential functions, operations, and performance levels. Resilience involves proactive risk management, diversification strategies, technology adoption, collaborative partnerships, and contingency planning.
3. **Risk Management Framework**: A structured approach to identifying, assessing, mitigating, and monitoring risks within a supply chain. This framework encompasses risk identification (identifying potential disruptions), risk assessment (evaluating impact and likelihood), risk mitigation (implementing strategies to reduce risk), and risk monitoring (continuous surveillance and response).
4. **Diversification**: The strategy of spreading risks across multiple sources, locations, or products within a supply chain to reduce dependency on a single point of failure. This includes supplier diversification (engaging multiple suppliers), geographic diversification (operating in multiple regions), and product diversification (offering a range of products or services).
5. **Technology Adoption**: The integration of advanced technologies such as analytics, Internet of Things (IoT), and blockchain into supply chain operations to enhance visibility, real-time monitoring, data-driven decision-making, and collaboration among supply chain stakeholders. Technology adoption is essential for improving resilience by enabling proactive risk management and efficient response to disruptions.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the existing literature on the impacts of supply chain disruptions on product availability. The review is organized around the following specific objectives: to quantify the impact of different types of supply chain disruptions, to evaluate the effectiveness of various inventory management strategies, and to analyze what role supply chain risk management practices play in enhancing resilience. The chapter is therefore going to rely on a wide range of academic sources, industry reports, and case studies for a nuanced understanding of these issues.

2.2 Empirical review

This section shall discuss the empirical literature on the study objectives:

2.2.1 The impact of different types of supply chain disruptions on product availability.

Natural disasters, such as earthquakes, hurricanes, and floods, will completely disrupt the supply chains into operational problems by destroying infrastructure, halting productions, and reducing transport facility options. For example, the earthquake and tsunami that hit Japan in 2011 caused an enormous amount of damage to industries like car and electronics; hence, delaying production and increasing costs for most businesses. The quantitative analyses will reveal that the natural disasters can shrink product availability by up to 30% initially, while these effects can also persist for many months Ivyvanov et al., 2014). These kinds of disruptions suggest the necessity for resilience strategies. Moreover, incorporating studies by Craighead et al. 2007 will place focus on geographical diversification and infrastructure resilience. Geographical diversification will spread the manufacturing and supplier bases across regions, reducing the dependence on a single event that can disrupt an entire supply chain. According to Tang & Tomlin, 2008, in 2011, during the earthquake in Japan, the diversified supply chains showed more product availability than the non-diversified chains.

It follows, therefore, that natural disasters will considerably affect the operations of supply chains and the availability of products. Such would be tempered by geographical diversification, resilient infrastructure, and better technological integrations that will

enhance supply chain resilience. Geographical dispersion, resilient infrastructure, and better technological integrations-these are the factors that will facilitate mitigation in these effects and thereby enhance supply chain resilience. The frequency of extreme weather events because of the influence of climate change and the ever-increasingly complex global supply chains call for exploring strategies in future studies.

Geopolitical issues such as trade wars, political instability, and changes in regulation can also wrack havoc through delays, escalating tariffs, and presenting compliance challenges that reduce availability of product into the market. These are good examples of disruptions which can be exemplified by the trade war between the US and China, which escalated costs in many industries and caused product shortages. Quantitative analyses exemplify that geopolitical disruptions could reduce the availability of the product by as much as 20-25%. This has driven the need for robust risk assessment and mitigation. It also requires the activation of proactive risk management, flexible supply chains, a diversified base of suppliers, strategic planning, and advanced technologies such as blockchain and predictive analytics that will enable businesses to navigate and effectively mitigate these impacts. Technological failures such as cyber-attacks and malfunctioning IT systems are bound to continue posing a threat to supply chain operations through cessation of production, disruption in communication, and loss of crucial data which will heavily impact product availability. Evidence can be drawn from the very rampant WannaCry ransomware attack that took place in 2017, affecting companies across the world and resulting in production stoppages and delays in delivery. Quantitative studies indicate that technological disruptions can reduce product availability by 15 to 20 percent, while the recovery time depends upon the magnitude of disruption and quality of IT contingency plans. There is, therefore, a requirement of an integrated system of cybersecurity measures coupled with IT resiliency strategies. For instance, the cyber-attack of NotPetya in 2017 severely affected Maersk Group as it led to the shutdown of operations, thereby resulting in huge losses. Preventive measures will include but are not limited to periodic security audits, training employees on advanced threat detection systems, and adequate IT contingency planning, which highly includes data backup and disaster recovery. Blockchain technology will provide full transparency and traceability, hence enhanced supply chain security. In general, these approaches will be critical in preventing technological failures that could compromise supply chain stability.

In fact, it is economic factors that have a key impact on the dynamism of the supply chain in that fluctuation in currency, commodity prices, and economic recessions disrupt product availability. For example, the full effect of the 2008 global financial crisis and economic slump led to general supply chain insecurity, reducing product availability by 10-15% (Giunipero et al., 2012; Chopra & Sodhi, 2014). Resilience plans against economic impacts in the supply chain involve financial hedging and forecasted demand, among others (Tang, 2006). Hedging strategies involve forward contracts and options, which therefore allow for the management of currency risks and commodity price fluctuations, hence insulating the product availability from the volatility of the economy. In this respect, effective demand forecasting allows taking proactive inventory management and production planning. Supply chains are flexible and adaptable to answer economic changes; therefore, they can be handy Giunipero et al. 2012. Collaboration among supply chain partners and information sharing develop coordination and decision-making and reduce negative impacts of economic disruptions Heckmann et al. 2015; Tang 2006. Therefore, it is vital to take a proactive approach towards the economic risk management for the resilience of the supply chains and to ensure consistent product availability.

Convergence of many forms of disruptions, as have been realized with the COVID-19 pandemic will significantly disrupt supply chains and hence their resiliency regarding product availability and operation, Ivanov & Dolgui 2020.
This crisis incorporated elements of natural disasters, geopolitical instability, technological disruptions, and economic volatility, thus setting quite unprecedented complexity for supply chain management, Ivanov & Dolgui 2020. Quantitative studies reveal that such combined type disruptions can lead up to a reduction in product availability of as much as 40%, Kilpatrick & Barter 2020. This thus calls for the immediate need to develop all-encompassing risk management strategies against multi-faceted risks. The literature will, therefore, focus on those building resilience, such as diversification of supplies and markets, investment in sophisticated technologies, and proactive planning of strategies´. Digital innovations such as blockchain and AI will further facilitate supply chain visibility, agility, and risk mitigation.

These technologies facilitate real-time monitoring, predictive analytics, and frictionless communications so that stakeholders can make truly informed decisions and have speed to adapt to disruptions. Mitigating multiple disruptions will require the integration of resilience strategies with digitized solutions to safeguard supply chain operations and ensure product availability in volatile environments. 2.2.2 The effectiveness of inventory management strategies in offering supply chain disruption protection that impacts product availability within firms. Inventory management strategies will, thus, play a critical role in responding to the disruptions in the supply chain to ensure that products are available. Efficient management of inventories will cushion such uncertainties to ensure that each business has enough stock that will meet the demand when it occurs. This section reviews literature on various inventory management strategies-safety stock, JIT, VMI, and their hybrids-on how each fares relatively in maintaining product availability when there is disruption in the supply chain. Examples of empirical studies, theoretical models, and case studies will be used throughout this review to provide a comprehensive understanding of these strategies. Safety stock is a strategic option for inventory management that a firm may make use of to offset supply chain uncertainties and ensure fulfilment of customer demand in the case of disruptions. Research evidence will prove it to be effective in industries characterized by great variability in demand and long lead times. As an example, Wagner and Bode (2006) will highlight the role of safety stock in the automotive industry, considered marked with volatile demand and production hold-ups. On the other hand, high levels of inventory create other problems, including higher holding costs and increased product obsolescence. Therefore, there will be a need to effectively balance out the risk and cost efficiency. According to Tang & Tomlin 2008, companies will apply probabilistic models and historical data so that safety stock levels can become efficient by taking into consideration market trends, suppliers' performance, and lead times variability. In this respect, Schmitt & Snyder 2012, as well as Ivanov et al. 2019, have supported the proposition that effective implementation would require an understanding of demand dynamics, supply chain vulnerability, and cost-benefit trade-off analysis. Just-in-time inventory management is designed to minimize the holding cost, which is achieved through synchronization of production with actual demand by maintaining low levels of inventory. This makes it be more effective in stable environments, given the fact that demand becomes easier to predict, and the supply chains are more reliable, according to Womack & Jones 2003.

However, it is exposed to risks, given that there are timely deliveries of small batches of inputs, as explained by Christopher & Lee 2004. The 2011 Japanese earthquake brought these vulnerabilities very much into the open and created considerable delays. Companies will also develop close relationships with their suppliers, engaging in advanced levels of visibility to monitor their performance in real time to mitigate various risks. Hybrid models that integrate JIT and safety stock will create a balance between low inventory and risk mitigation to further create resilience and continuity in operations. VMI is a cooperative approach whereby suppliers maintain the inventory level on behalf of their customers to ensure timely replenishment based on customers' or third-party logistics providers' real-time data. This will enhance the supply chains' efficiency and decrease the stockout probability during disruption situations, as indicated by Disney & Towill (2003) and Yao et al. (2007).

Previous research, particularly those related to industries with stable demand, shows that the implementation of VMI enhances inventory turnover and decreases the likelihood of stockouts, as can be seen from Dong & Xu (2002) and Småros et al. (2003). However, effective VMI depends on very high levels of confidence and information flow between the supplier and the customer, and the creation of that exposes some challenges. It works effectively depending on the capability of the supplier to efficiently manage inventories and react to fluctuations in demand. Nevertheless, VMI will present an advanced form of inventory management, reduction in stockout, and increased cooperation, hence one of the best approaches in the optimization of the inventory process and resilience development. Hybrid approaches in managing inventory will, therefore, borrow from all these approaches to have maximum benefits while minimizing short-comings: a flexible approach in inventory optimization. For example, safety stock may be carried but at the same time utilizing the JIT principle for high-turnover items which could further facilitate efficiency, according to Kouvelis et al. 2006.

Research also indicates that hybrid strategies will make the supply chain resilient to disruption since it creates flexibility, thus reducing disruption vulnerability, according to Schmitt & Singh 2009. A case study by Tomlin shows that the combination of safety stock and JIT provides much better resilience in industries like electronics, usually suffering from volatile demand and disruptions. These approaches help companies dynamically change their inventory policies in view of changing risks and market behaviors. This is very

important in modern, complex conditions of a supply chain, as mentioned by Blackhurst et al. The hybrid approach has helped companies wade through a number of supply chain complexities, optimize their inventory, reduce instances of disruption, and make sure continuity exists against dynamic market conditions. Sheffi & Rice, 2005) 2.2.3 The analysis of the role of supply chain risk management practices in enhancing the resilience of businesses to product availability disruptions Supply chain risk management will play an important role in enhancing business resilience to the disruptions that threaten product availability.

As the global supply chain further develops into a tangled web of connected relationships, the vulnerability to disruption will further increase, thereby requiring appropriate SCRM practices that can ensure the availability of products and continuity of operations (Tang & Musa, 2011).

This section discusses the review of the literature in terms of various SCRM practices: processes of risk identification, risk assessment, risk mitigation, and contingency planning, and their relationship with the resilience of supply chains. These practices will be understood from an empirical study, theoretical models, and case analyses. Supply Chain Risk Management would involve the elemental process of risk identification through which there would be systematic identification of risks that may cause disruption to supply chain operations (Christopher & Peck, 2004). Practices such as scenario analysis, review of historical data, and consultation with stakeholders would be effective in drawing valuable insights regarding potential risks (Zsidisin et al., 2005). It is proactive in nature, thus one can predict disruption for an organization to create a mitigation strategy. Wagner and Bode (2008) suggested strong practices of risk identification allow organizations to pre-identify the occurrence of a supply chain disruption and proactively take measures to respond against that event. Big data analytics and AI are recent technologies enabling better identification of risk factors due to real-time information and predictive analytics. Integration of these practices with advanced technologies enhances SCRM capabilities in resilience and addressing modern complexities and uncertainties in the supply chain. Evaluated critically, identified supply chain risks are assessed in terms of their likelihood of occurrence and actual impact on operational activities. During this stage, risk-severity scoring and prioritization of disruptions to the supply chain activities based on their impact are done.

This analysis will be enabled through quantitative and qualitative approaches, including risk matrices, failure mode and effects analysis (FMEA), and Monte Carlo simulations. Much literature emphasizes effective risk assessment management practices that will enable a business to deploy available resources effectively and focus its attention on high-priority risks. For example, the case study by Manuj and Mentzer (2008) demonstrates that organizations adopting comprehensive techniques of risk assessment are more prepared to handle various crises that disrupt product availability. In supply chain management, risk mitigation requires the strategic development and implementation of processes to reduce either the likelihood of occurrence or consequences of identified risks (Jüttner et al., 2003). Common strategies include supplier diversification, inventory buffering, flexible contracts, and nurturing collaborative partnerships. According to Tang & Tomlin 2008 Literature has called for the above practices' implementation in developing a shock sustaining supply chain. Supplier diversification frees the firm from dependency on one or a few suppliers. According to Kern et al. 2012.

Inventory buffering absorbs demand variability and other sources of delays; thus, it provides flexibility. According to Simchi-Levi et al. 2014. Where there is a collaborative partnership, communication and coordination increase, adding to resilience. Integrating all these proactive strategies enables the firm to effectively address various vulnerabilities, reduce the impact of disruptions, and ensure continuous operations even in highly uncertain environments. This has been evident in works by Jüttner et al. (2003), Tang & Tomlin (2008), Sheffi & Rice (2005), Kern et al. (2012), Simchi-Levi et al. (2014), and Barratt (2004), which, by extension, improved performance, satisfaction, and sustainability in competitive business environments. Contingency planning involves the plans that are made beforehand to circumvent disruptions of supply chains with a proper response strategy. Generally, SCRM requires contingency planning for a well-thought-out response and preparedness to mitigate the impacts of disruptions. For any disruption, therefore, the plans should contain adequate details on action plans, resources allocation mechanisms, and communication lines that can be promptly activated in case such eventualities occur. The literature has also identified that the rationale behind contingency planning is an effective weapon in ensuring speed recovery and reducing the consequences of disruptions on the accessibility of products. Companies with more developed plans can recover faster from disruptions, and therefore can sustain a higher level of product availability. Only regularly tested and updated plans can be relevant and effective in changing and dynamic risks.

Proactive planning and strategy refinement may make resilience easier to achieve, reducing lost time and maintaining operational continuity even in volatile situations, thereby perhaps enhancing supply chain performance and customer satisfaction.

2.3 Literature Summary

The literature review in this study will review some of the literature on the varying effects that Supply Chain Disruptions have on the availability of products. Among the aspects to be reviewed include natural disasters, geopolitical issues, technological failures, and economic factors; a special mention will be given to those combined effects emanating from the COVID-19 pandemic. Safety stock, Just-in-Time (JIT), Vendor-managed inventory (VMI), hybrid approaches, among other inventory management strategies regarding risk mitigation, will be discussed. It will outline SCRM processes such as the identification of risks, evaluation, and mitigation strategies, including supplier diversification and contingency planning. The chapter shall emphasize proactive measures to be taken, including the infusion of technology and the continuous adjustment of strategy in building supply chain resilience towards operational continuity at the time of disruption.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter highlights the research methodology to be adopted for this research work in studying how disruptions to the supply chain affect the availability of products. This covers details on the design of the research, methods of data collection, techniques used in analysing data, and also considerations of ethical issues that are crucial to the research study. The methodology will, therefore, aim at making sure that the analysis is comprehensive and well-rounded in answering the research objectives efficiently.

3.2 Research Design

This study has embraced a mixed-method approach, integrating qualitative and quantitative data analyses in presenting an all-rounded understanding of the complex impacts of supply chain disruptions on product availability. Qualitative methods will explore some of the subtle aspects of disruptions that capture the contextual complexities, stakeholder perspectives, and the subtleties of risk management strategies. On the contrary, quantitative data analysis empirically underlined the extent of disruptions, measured their impact in product availability, and brought out trends and patterns across a variety of disruption scenarios. This integrated approach thus provided the basis for a holistic investigation combining qualitative insights with statistical evidence in the capture of complex findings, strategic informing of key decision-making, and development of targeted mitigation strategies against specific supply chain contexts and disruption scenarios.

3.3 Study Population

The study involves 45 respondents from different sectors within the industry of supply chain, giving the study wide insights with data.

3.4 Sampling Method/Technique

Direct simple random sampling has been used to select those respondents to be included in the sample. This sampling technique has been used to give equal chances to all members of the population to be included in the sample; thus, it helped eliminate bias as well as other sampling errors.

3.4.1 Sample Size

A sample of 45 respondents derived from the Krejcie & Morgan tables, 1970, which consider a sample that was at least 30 % of the population to be a viable representative of the population.

3.5 Data Collection Tools and Methods

Both secondary and primary methods have been utilized in data collection to ensure comprehensiveness supplemented with structured surveys for primary data collection.

3.5.1 Primary Sources of Data

a. In-depth Interviews of Supply Chain Managers: First-hand information relating to the challenges and strategies concerning supply chain disruption management was extracted through interviews with supply chain managers of various industries. The interview also highlighted detailed experiences, perceptions, and practical solutions of people who were directly related to supply chain operations.

b. Surveys and Questionnaires: Structured surveys and questionnaires were distributed to a wide range of supply chain professionals for the purpose of gathering quantitative data regarding frequency, types, and impacts of supply chain disruptions. The method also obtained information on the effectiveness of various mitigation strategies and the practice of resilience.

a. Industry Reports and White Papers: From industry associations to consulting firms, these provided in-depth analyses of supply chain trends, challenges, and best practices that gave context and benchmarking data on how different sectors were addressing supply chain disruptions.

b. Academic Journals and Peer-Reviewed Articles: Scholarly articles and research papers from reputed academic journals were necessary to get theoretical grounds and empirical evidence about supply chain risk management. These helped identify some gaps in the existing knowledge as well as support the methodology and findings of this study through established research.

3.6 Data Analysis

a. Quantitative Data Analysis Techniques: Quantitative data analysis in this study was done through the use of descriptive and inferential statistics to analyze data from surveys and questionnaires. Descriptive statistics summarize basic features of data, like mean, median, and standard deviation.

b. Qualitative Data Analysis Techniques: Thematic and content analysis were undertaken as the qualitative techniques to interpret data from interviews and case studies. Thematic analysis included coding data on recurring themes and patterns about supply chain disruptions, risk management practices, and resilience strategies. Content analysis involved the systematic categorization and quantification of specific words, phases, or concepts in texts from company reports and industry publications that underlined main issues and trends. Comparative analysis has been used to identify the commonalities and differences in case studies, emphasizing best practices and areas of improvement. These techniques provided deep insights into the qualitative aspects of supply chain resilience.

3.7 Ethical Considerations

The research, therefore, committed itself to upholding ethical standards through the protection of information by ensuring participants remained anonymous throughout. Consent was sought in advance from respondents who were informed of the aims of the research and their rights within it. Further, the information collected would not be disclosed for any purpose other than that mentioned in the research, thus guaranteeing integrity and ethics during the course of the study.

3.8 Limitations of the Study

The limitation of the study was thus accepted to allow for a proper balance in understanding the research findings. First, the scope of the study was limited to particular supply chain scenarios that may not be generalized into another setting or industry easily. Additionally, biases came in the form of relying on self-reported data from the respondents themselves, as their personal perceptions or not wanting to supply responses that cast them in a poor light would influence the answers. The study also used a cross-sectional design, which had its time limitations regarding establishing causality between supply chain strategies and their effectiveness.

Moreover, supply chain technologies and practices moved faster than the coverage and tenets of this study; hence, some of the conclusions derived could be less relevant over time. Last but not least, although the study has taken each and every measure to capture various perspectives, the sample size may not fully represent all relevant stakeholders; hence, the findings that might be extracted from the research.

CHAPTER FOUR

DATA ANALYSIS, INTEPRETATION AND PRESENTATION OF THE RESEARCH FINDINGS

4.0 Introduction

This chapter includes the analysis, interpretation and presentation of the data given by the respondents and discusses the findings of the entire study with reference to examining the impacts of supply chain disruptions on product availability. The researcher used a questionnaire as a tool to obtain data from the field. Some of the characteristics considered included gender of respondents, academic qualifications, education level, departments in which they work in the organization among others. The presentation is facilitated by the use of tables, pie charts, percentages and the use of main points reached by generalization of what was found out.

4.1 Findings on Bio-data of the respondents.

4.1.1 Findings on gender of respondents.

Table 1: Gender of the respondents

Gender	**Frequency**	**Percentage (%)**
Male	21	52.5%
Female	19	47.5%
Total	**40**	**100%**

From the information above, the distribution of the respondents according to their gender shows that majority of the respondents 21(52.5%) were male and the female were 19(47.5%). Male respondents were more than female respondents implying the organization strives for gender equality, diversity and inclusion of women at work.

4.1.2 Findings on the age groups of the respondents.

Table 2 Age groups of the respondents

Age group	**Frequency**	**Percentage (%)**
20 – 25 years	10	25%
30 years	10	25%
31 – 35years	7	17.5%
36 – 40 Years	8	20%
Above 40 years.	5	12.5%
Total	**40**	**100%**

From the information above, the distribution of the respondents according to age groups shows that 25% of the respondents were of age group 20-25 years, 25% were also age group 30, 31-35 years of age were 17.5%, 36.40 years were 20% an above 40 years were 12.5%. This means that workers were well represented in their respective age groups.

4.1.3 Findings on the level of education of the respondents.

Table 3: Level of education of the respondents

Level of education	**Frequency**	**Percentage (%)**
Bachelors	26	65%
Diploma	9	22.5%
Masters	5	12.5%
Total	**40**	**100%**

From the table above, 12.5% of the total respondents were Masters holders, 65% (26) were Bachelor's degree holders, and 22.5% (9) were Diploma holders. This shows that the organization employs skilled and educated and knowledgeable employees who perform to high expectations.

4.2 Findings on the Main Issues of the study

4.2.1Effectiveness of different strategies in mitigating supply chain disruptions that affect product availability

The first research question dealt with the effectiveness of different strategies in mitigating supply chain disruptions that affect product availability. The table below captures the findings thereof.

Table 4: Effectiveness of different strategies in mitigating supply chain disruptions that affect product availability

Effectiveness of different strategies in mitigating supply chain disruptions that affect product availability	Min	Max	Mean	Std. Deviation
"Natural disasters (e.g., earthquakes, hurricanes, floods) significantly reduce product availability in supply chain."	1.00	4.00	3.49	1.14
"Investments in resilient infrastructure have enhanced supply chain's ability to maintain product availability during disruptions."	2.00	4.00	3.64	1.03
"Proactive risk management strategies effectively mitigate the impact of geopolitical disruptions on product availability."	1.00	4.00	3.34	1.09
"IT contingency plans, including data backup and disaster recovery, are effective in maintaining product availability during technological disruptions."	2.00	4.00	3.64	1.03
"economic resilience strategies, such as financial hedging and demand forecasting, have successfully mitigated the impact of economic disruptions on product availability."	1.00	4.00	2.59	1.14
"Supply chain recovers quickly from major disruptions (e.g., natural disasters, geopolitical issues, technological failures), ensuring minimal long-term impact on product availability."	1.00	4.00	2.93	1.02
"Supply chain effectively utilizes advanced technologies (e.g., blockchain, AI, predictive analytics) to enhance visibility and mitigate the impact of disruptions on product availability."	1.00	4.00	2.78	1.01

Concerning the effectiveness of different strategies in mitigating supply chain disruptions that affect product availability, findings showed that natural disasters (e.g., earthquakes, hurricanes, floods) significantly reduce product availability in supply chain (mean=3.49). Investments in resilient infrastructure have enhanced supply chain's ability to maintain product availability during disruptions (mean=3.64). Proactive risk management strategies effectively mitigate the impact of geopolitical disruptions on product availability (mean=3.34)."IT contingency plans, including data backup and disaster recovery, are effective in maintaining product availability during technological disruptions (mean=3.64)."

In addition, economic resilience strategies, such as financial hedging and demand forecasting, have successfully mitigated the impact of economic disruptions on product availability (mean=2.59)."Supply chain recovers quickly from major disruptions (e.g., natural disasters, geopolitical issues, technological failures), ensuring minimal long-term impact on product availability (mean=2.93)."Supply chain effectively utilizes advanced technologies (e.g., blockchain, AI, predictive analytics) to enhance visibility and mitigate the impact of disruptions on product availability (mean=2.78).

4.2.2 Effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability

The second research question dealt with the effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability. The table below captures the findings thereof.

Table 5: Effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability

Effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability	Min	Max	Mean	Std. Deviation
Use of safety stock effectively mitigates the impact of supply chain disruptions on product availability."	2.00	4.00	3.30	1.12
"The increased holding costs and risk of obsolescence associated with safety stock are significant challenges for our business."	1.00	4.00	3.08	1.25
"Reliance on Just-in-Time (JIT) inventory management makes us vulnerable to supply chain disruptions."	2.00	4.00	3.56	1.12
"Close relationships with suppliers and real-time monitoring tools effectively reduce the risks associated with Just-in-Time (JIT) inventory management."	2.00	4.00	3.63	1.16
"Vendor-managed inventory (VMI) has improved our ability to maintain product availability during supply chain disruptions."	1.00	4.00	3.49	1.14
"High levels of trust and information sharing with our suppliers are essential for the success of vendor-managed inventory (VMI) strategy."	1.00	4.00	2.67	0.98
"Hybrid inventory management strategies, which combine elements of safety stock and Just-in-Time (JIT), effectively enhance supply chain resilience."	1.00	4.00	2.75	0.98
"Inventory policies are adaptable and can be dynamically adjusted to respond to evolving supply chain risks and market conditions."	1.00	4.00	2.96	0.97

The findings in the table above shows the effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability. According to these results, the use of safety stock effectively mitigates the impact of supply chain disruptions on product availability (mean=3.30). The increased holding costs and risk of obsolescence associated with safety stock are significant challenges for our business

(mean=3,08). Reliance on Just-in-Time (JIT) inventory management makes us vulnerable to supply chain disruptions (mean=3.56).Close relationships with suppliers and real-time monitoring tools effectively reduce the risks associated with Just-in-Time (JIT) inventory management (mean=3.63). Vendor-managed inventory (VMI) has improved our ability to maintain product availability during supply chain disruptions (mean=3.49).

Moreover, high levels of trust and information sharing with our suppliers are essential for the success of vendor-managed inventory (VMI) strategy (mean=2.67). Hybrid inventory management strategies, which combine elements of safety stock and Just-in-Time (JIT), effectively enhance supply chain resilience (mean=2.75). Inventory policies are adaptable and can be dynamically adjusted to respond to evolving supply chain risks and market conditions (mean=2.96).

4.2.3 Different aspects of Supply Chain Risk Management (SCRM) and their role in enhancing business resilience

The third research question focused on the different aspects of Supply Chain Risk Management (SCRM) and their role in enhancing business resilience. The table below captures the findings thereof.

Table 6: Different aspects of Supply Chain Risk Management (SCRM) and their role in enhancing business resilience

Different aspects of Supply Chain Risk Management (SCRM) and their role in enhancing business resilience	Min	Max	Mean	Std. Deviation
Organization consistently identifies potential risks that could disrupt supply chain operations.	1.00	4.00	2.67	0.98
Organization consistently identifies potential risks that could disrupt supply chain operations.	1.00	4.00	2.75	0.98
We use advanced technologies, such as big data analytics and AI, to enhance risk identification processes	1.00	4.00	2.96	0.97
Organization effectively assesses the likelihood and impact of identified supply chain risks using comprehensive methods.	1.00	4.00	2.97	1.02
The risk assessment practices in our organization enable efficient resource allocation to manage high-priority risks.	1.00	4.00	2.87	1.00
We implement strategic measures such as supplier diversification and inventory buffering to mitigate supply chain risks.	2.00	4.00	3.63	1.16
Organization has well-developed contingency plans that are activated promptly during supply chain disruptions.	2.00	4.00	3.30	1.12
We regularly test and update our contingency plans to ensure they remain effective against evolving supply chain risks.	1.00	4.00	3.08	1.25
We regularly test and update our contingency plans to ensure they remain effective against evolving supply chain risks.	1.00	4.00	2.97	1.02

The findings in the table above show the responses on different aspects of supply chain risk management (SCRM) and their role in enhancing business resilience. According to these results, organization consistently identifies potential risks that could disrupt supply chain operations (mean=2.67).Organization consistently identifies potential risks that could disrupt supply chain operations (mean=2.75).We use advanced technologies, such as big data analytics and AI, to enhance risk identification processes (mean=2.96).

Similarly, organization effectively assesses the likelihood and impact of identified supply chain risks using comprehensive methods (mean=2.97).The risk assessment practices in our organization enable efficient resource allocation to manage high-priority risks (mean=2.87).We implement strategic measures such as supplier diversification and inventory buffering to mitigate supply chain risks (mean=3.63).

In addition, organization has well-developed contingency plans that are activated promptly during supply chain disruptions (mean=3.30).We regularly test and update our contingency plans to ensure they remain effective against evolving supply chain risks (mean=3.08).We regularly test and update our contingency plans to ensure they remain effective against evolving supply chain risks (mean=2.97).

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1Introduction

This chapter discusses the findings with a view of concluding and making recommendations regarding how supply chain disruptions affect product availability. This was in order to meet the set objectives of the study.

5.2 Discussion

5.2.1 Effectiveness of different strategies in mitigating supply chain disruptions that affect product availability

The findings also enumerate the efficacy of various strategies in mitigating different supply chain disruptions that impact product availability. The product availability in supply chain due to natural disasters such as earthquakes, hurricanes, and floods is significantly lower at mean=3.49. Investments in resilient infrastructure have enhanced supply chain's ability to maintain product availability during disruptions to mean of 3.64. Proactive risk management strategies mitigate the effect of geopolitical disruptions on product availability at a mean of 3.34. Results reveal that the backup of data and disaster recovery in-built in the contingency plans within the .IT help to keep the products available in the event of technological breakdowns or disruptions (mean=3.64).

More importantly, the economic resilience strategies of financial hedging and demand forecasting have minimized the impact of economic disruption on product availability; mean: 2.59. "Supply chain quickly recovers from major disruptions such as natural disasters, geopolitical issues, and technology failures, limiting long-term impact on product availability." Mean 2.93. "Supply chain capitalizes on enabling technologies such as blockchain, AI, and predictive analytics in-order to gain visibility on impending disruptions and limit such disruptions' effect on product availability." Mean 2.78. Results above confirm the literature reviewed that economic factors are one of the prominent causes of disturbance in supply chain dynamics, disrupting product availability due to currency fluctuations and volatility in commodity prices alongside economic recessions. Indeed, the 2008 global financial crisis aptly demonstrates how economic recessions trigger large-scale disruption in supply chains, which resulted in a decline in product availability by 10-15% (Chopra & Sodhi, 2014). In this respect, appropriate

economic resiliency involving financial hedging and demand forecasting is very vital to curb these impacts (Tang, 2006).

Results also concur with literature where effective demand forecasting empowers proactive inventory management as well as production planning. A supply chain has to be flexible enough and able to respond quickly to changing economies . Collaboration and information sharing among the partners in supply chains foster coordination and decision-making in light of economic disruption . This requires proactive management of economic risk, which is core to supply chain resilience and can assure consistent product availability. Results also chime together with the argument that convergence of different kinds of disruptions, as observed in the COVID-19 pandemic, would seriously test supply chains regarding the availability of products and operational resilience. This crisis entrapped within itself all types of threats-natural disasters, geopolitical, technological, and financial-thus presenting unforeseen complexities for supply chain management. This calls for immediate attention to risk management strategies that could handle such diverse threats.

5.2.2 Sufficiency of the inventory management strategies in lessening the impact of supply chain disruption on product availability

a. The results of sufficiency of inventory management strategies in lessening the impact of supply chain disruption on product availability are shown below. From these results, it could be seen that safety stock is effective in lessening the impact of disruptions on product availability within the supply chain. (mean=3.30). The increased holding costs and risk of obsolescence associated with safety stock are significant challenges for our business. We rely on Just-in-Time inventory management, and hence, we have a vulnerability in the case of any disruption in our supply chain. Stronger relationships with suppliers and monitoring tools in real time avoid risks of having Just-in-Time (JIT) inventory management. Vendor-managed inventory manages our product availability even in disrupted supply chains. Second, the VMI strategy necessitates a great deal of trust and sharing of information with our suppliers if it is to work. In this regard, the survey returned a mean of 2.67. Hybrid approaches that marry elements of safety stock and JIT methods work best in strengthening the resiliency of the supply chain. This statement has been supported with a mean of 2.75. The inventory policies can be changed and dynamically adjusted to meet the changing supply chain risks and

market conditions. This has been supported with a mean of 2.96. These findings are consistent with the literature review in that good inventory management insulates against uncertainties and gives a business enough stock to meet demand in case disruptions occur. This section reviews the literature on various inventory management strategies that are adopted in light of safety stock, JIT, VMI, and hybrid approach for review of efficiency that each strategy ensures product availability during disruption in supply. Empirical studies, theoretical models, and case studies have also been reviewed to garner comprehensive information on the strategies.

b.

Results are also in agreement with those authors that safety stock is one of the core inventory management strategies that businesses use to hedge supply chain uncertainties and ensure customer demand satisfaction in cases of disruption. This paper will demonstrate how effective research, especially in industries characterized by high demand variability and long lead times, can be. For instance, Wagner and Bode (2006) will describe how safety stock works in the context of an automotive industry with unstable demand but also having delay production. Similarly, the holding of large amounts of inventories is costly, as it could be subjected to holding costs and product obsolescence; therefore, a trade-off between risk reduction and cost efficiency has to be considered when making decisions on this level of inventory (Tang & Tomlin, 2008). More importantly, it develops probabilistic models on historical data that enable enterprises to optimize their safety stock based on market trends, supplier performance, and variability in the lead time (Schmitt & Snyder, 2012). The effectiveness of the implementation will depend on the analyses of demand dynamics, supply chain vulnerability, and cost-benefit trade-off. 5.2.3 Different facets of the SCRM and its role in the improvement of business resilience

Findings on different aspects of SCRM and their contribution to enhancing business resilience: Items Mean Organization constantly identifies the potential risks which could disrupt the operations of the supply chains. 2.67 Organisation constantly identifies the potential risks that could disrupt supply chain operations. 2.75 We are using advanced technologies such as big data analytics and AI for enhancing the risk identification processes. 2.96.

Similarly, the organization assesses the occurrence probability and consequence of the identified supply chain risk with the help of an all-rounded approach. The risk assessment practices of our organization assign adequate resources to high-priority risks with a mean of 2.87. We address the supply chain risk mitigation strategies through strategic measures like supplier diversification and inventory buffering with a mean of 3.63.

Moreover, the organization has contingency plans for various scenarios of disruption to the supply chain-mean 3.30. We periodically test and revise our contingency plans so that they continue to serve effectively against the ever-changing supply chain risks-mean 3.08. We periodically test and update our contingency plans so that they continue to serve effectively against the ever-changing supply chain risks-mean 2.97.

However, consistent with the above finding, broad research underlines best practices in risk assessment insofar as businesses can thus allocate their resources in a very efficient way and spend efforts on high-priority risks only. For example, it follows from the case study carried out by Manuj and Mentzer (2008) that the organizations following the best practices in the techniques of risk assessment would be more prepared to handle disruptions and ensure product availability during crisis situations.

Findings that are also congruent with the assertion of Jüttner et al. (2003) that, in supply chain management, risk mitigation deals with the strategic development and implementation of measures that potentially reduce the occurrence of, or impact from, identified risks.

The typical strategies are composed of diversification of suppliers, buffering of inventory, flexible contracts, and fostering of collaborative partnership. Literature emphasizes adopting these practices to build a resilient supply chain capable of withstanding disruptions. These practices include selecting appropriate suppliers to create a resilient supply chain, mitigating risks in the supply, reducing dependence on single suppliers, addressing fluctuations in demand and delays, improving flexibility, enhancing communication and coordination, which strengthens resilience. These will help in addressing vulnerabilities, reducing the impact of disruptions, and guaranteeing continuity through uncertainty. With the realization of the above issues, the following is noted: Jüttner et al., 2003;

5.3 Conclusions

The study concludes that natural disasters significantly reduce product availability in supply chain, which means that investments in resilient infrastructure and proactive risk management strategies effectively enhance supply chain's ability to maintain product availability during disruptions.

This study concludes that the potentials of inventory management strategies in mitigating the impact of supply chain discontinuities on product availability are by the use of safety stock and close relationships with suppliers and real-time monitoring tools effectively reduce the risks.

Thirdly, the study establishes that various dimensions of SCRM and their contributions to the improvement of business resilience are further achieved when an organization is consistently able to identify a possible supply chain disruption through the use of advanced technologies to improve risk identification processes, such as big data analytics and artificial intelligence.

5.4 Recommendations

Companies have to invest aggressively in resilient infrastructure and strategies of proactive risk management in order to effectively enhance the potential of the supply chain for sustaining product availability in the face of disruptions. Firms have to enhance the effectiveness of the inventory management strategies in lessening the impact of a disruption to the supply chain on the availability of their products through using safety stock, close and tight relationships with the suppliers, and real-time monitoring tools for a substantial reduction of the risks.

The companies should, therefore, invest in all aspects of SCRM, improving business resilience by the continuous identification of potential risks that could disrupt the supply chain through the use of big data analytics and advanced technologies such as AI.

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

QUESTIONNAIRE

My name is Kemigisha Janice a student of Uganda Christian University carrying out a study on the impact of supply chain disruptions on product availability on the supply chain as a partial requirement for the award of Bachelor of procurement and logistics management of Uganda Christian University. You have been selected to participate in this study as a respondent. Kindly provide the most appropriate information as indicated in the questionnaire based on your objective experiences. The information provided shall be used for academic purpose and will be kept with utmost confidentiality. Thank you and may the almighty reward you.

Yours faithfully,

Kemigisha Janice
Indicates required question

Email

Your email address

Demographic Characteristics

Select your gender:

Male
Female

Select you age below

Below 20 years
20 – 25 years
30 years
31 – 35years
36 – 40 Years
Above 40 years.

Highest level of education Qualification
Certificate

Diploma
Bachelors
Masters
Others

1. Effectiveness of different strategies in mitigating supply chain disruptions that affect product availability

"Natural disasters (e.g., earthquakes, hurricanes, floods) significantly reduce product availability in
supply chain."

Strongly Disagree
Disagree
Agree
Strongly agree

"Investments in resilient infrastructure have enhanced supply chain's ability to maintain product availability during disruptions."

Strongly Disagree

Disagree
Agree
Strongly agree

"Proactive risk management strategies effectively mitigate the impact of geopolitical disruptions on product availability."

Strongly Disagree

Disagree
Agree
Strongly agree

"IT contingency plans, including data backup and disaster recovery, are effective in maintaining product availability during technological disruptions."

Strongly Disagree

Disagree
Agree
Strongly agree

"economic resilience strategies, such as financial hedging and demand forecasting, have successfully mitigated the impact of economic disruptions on product availability."

Strongly Disagree
Disagree
Agree
Strongly agree

"Supply chain recovers quickly from major disruptions (e.g., natural disasters, geopolitical issues, technological failures), ensuring minimal long-term impact on product availability."

Strongly Disagree
Disagree
Agree
Strongly agree

"Supply chain effectively utilizes advanced technologies (e.g., blockchain, AI, predictive analytics) to enhance visibility and mitigate the impact of disruptions on product availability."

Strongly Disagree
Disagree
Agree
Strongly agree

2. Effectiveness of inventory management strategies in mitigating the impact of supply chain disruptions on product availability:

Use of safety stock effectively mitigates the impact of supply chain disruptions on product availability."

Strongly Disagree
Disagree
Neutral
Agree
Strongly agree

"The increased holding costs and risk of obsolescence associated with safety stock are significant challenges for our business."

Strongly Disagree
Disagree
Agree
Strongly agree

"Reliance on Just-in-Time (JIT) inventory management makes us vulnerable to supply chain disruptions."

Strongly Disagree
Disagree
Agree
Strongly agree

"Close relationships with suppliers and real-time monitoring tools effectively reduce the risks associated with Just-in-Time (JIT) inventory management."

Strongly Disagree
Disagree
Agree

Strongly agree

"Vendor-managed inventory (VMI) has improved our ability to maintain product availability during supply chain disruptions."

Strongly Disagree
Disagree
Agree
Strongly agree

"High levels of trust and information sharing with our suppliers are essential for the success of vendor-managed inventory (VMI) strategy."

Strongly Disagree
Disagree
Agree
Strongly agree

"Hybrid inventory management strategies, which combine elements of safety stock and Just-in-Time (JIT), effectively enhance supply chain resilience."

Strongly Disagree
Disagree
Agree
Strongly agree

"Inventory policies are adaptable and can be dynamically adjusted to respond to evolving supply chain risks and market conditions."

Strongly Disagree
Disagree
Agree
Strongly agree

3. Different aspects of Supply Chain Risk Management (SCRM) and their role in enhancing business resilience:

Organization consistently identifies potential risks that could disrupt supply chain operations.

Strongly Disagree
Disagree
Agree
Strongly agree

Organization consistently identifies potential risks that could disrupt supply chain operations.

Strongly Disagree
Disagree
Agree
Strongly agree

We use advanced technologies, such as big data analytics and AI, to enhance risk identification processes.

Strongly Disagree
Disagree
Agree
Strongly agree

Organization effectively assesses the likelihood and impact of identified supply chain risks using comprehensive methods.

Strongly Disagree
Disagree
Agree
Strongly agree

The risk assessment practices in our organization enable efficient resource allocation to manage high-priority risks.

Strongly Disagree
Disagree
Agree
Strongly agree

We implement strategic measures such as supplier diversification and inventory buffering to mitigate supply chain risks.

Strongly Disagree
Disagree
Agree
Strongly agree

Organization has well-developed contingency plans that are activated promptly during supply chain disruptions.

Strongly Disagree
Disagree
Agree
Strongly agree

We regularly test and update our contingency plans to ensure they remain effective against evolving supply chain risks.

Strongly Disagree
Disagree
Agree
Strongly agree

SCHOOL OF BUSINESS

19th Aug, 2024

TO WHOM IT MAY CONCERN

Name**: KEMIGISHA JANICE MZUNGU** Reg. No S21B12/142

A bachelor's student who is seeking permission from your office to collect data for her dissertation titled

The effect of supply chain disruptions on product availability.

We shall be grateful if you could render assistance to her in collecting the necessary data for her dissertation

The Uganda Christian University School of Business thanks you in advance

……..

Mukisa Simon Peter

Research coordinator