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Supply Chain Risk Management Strategies

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This is to certify that the doctoral study by

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Walden University
2024

Abstract

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by

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MS, Nova Southeastern University, 2003

BS, University of the West Indies, 1999

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Ineffective supply chain risk management strategies negatively affect company profitability. Supply chain managers are concerned with ineffective risk management strategies, which can erode the company's profitability. Grounded in the structural contingency theory of fit, the purpose of this qualitative multiple case study was to explore strategies oil supply chain managers use to manage supply chain risks effectively. The participants were eight supply chain managers of four companies in the Jamaican oil industry who successfully implemented strategies to manage supply chain risks and improve profitability. Data were collected using semistructured interviews. Through thematic analysis, three themes were identified: (a) adaptability and flexibility to oil price volatility, (b) partnerships and collaboration, and (c) quality assurance. A key recommendation is for supply chain managers to utilize a collective approach to risk management, which incorporates mutually beneficial partnerships among supply chain stakeholders. The implications for positive social change include the potential to empower skilled employees and create jobs for the wider community.

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Dedication

Completing my doctoral journey would not have been possible without the support and encouragement of my family and friends. I would like to dedicate this academic achievement to my husband Nagel Stewart, for his patience and unwavering support. Thank you for not allowing me to give up and for constantly pushing me towards achieving this goal. I could not have done it without you.

To my friend and inspiration Sharon Malcolm, who passed away before I was able to complete this journey, I dedicate this achievement to you for being my sounding board and motivator through the challenging periods.

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Section 1: Foundation of the Study

The increase in the complexity and robustness of the supply chain resulting from globalization gives rise to the growing attention which academicians pay to supply chain risks (Huy & Yoshinori, 2019). The management of risks in the supply chain can determine the success of any business. Ali et al. (2018) highlighted the negative effects of supply chain disruptions on the viability of an organization. In this study, I will identify the supply chain strategies that managers could use to manage risk in the oil supply chains. Managers seek to identify supply chain risks to reduce the impact on the organization's performance (Truong Quang & Hara, 2018). The results of this study could provide guidance to supply chain managers in the oil industry on how to manage the risks in their supply chains.

Background of the Problem

Academicians and practitioners seek to control and mitigate supply chain disruptions because of the impact on companies' profitability (Ho et al., 2015). Supply chain risk management, which encompasses the identification, measurement, and prioritization of supply chain risks to enable the implementation of risk mitigation and control strategies (Aqlan & Lam, 2015), represents an approach to risk mitigation in the supply chain.

Organizational leaders are now incorporating risk management as part of the organizational long-term objectives, as the ability to manage risks is an important component for success in business (Ali & Shukran, 2016). Risk management is an essential aspect of supply chain operations, as disruptions in the supply chain can

negatively impact the company's performance (Ho et al., 2015). Researchers in extant literature, highlighted the need for effective management of risks, which will enhance supply chain resilience, based on the increasing growth of global supply networks, and the complexities of the global environment (Chang et al., 2015).

Critical to risk management in the supply chain is the implementation of the appropriate strategies for the different risks (Manuj et al., 2014). Based on the interrelatedness of supply chain risks, mitigation strategies developed to address particular risks may amplify other risks (Aqlan & Lam, 2015). Further, some supply chain activities may have to be adjusted to reduce the consequences of other supply chain risks (Micheli et al., 2014). Gualandris and Kalchschmidt (2015) pointed out that supply chain managers should seek to establish a state of balance between the observed risks and the selected risk management strategies to effectively utilize a company's available resources and improve financial performance.

Problem and Purpose

Supply chain disruptions can lead to catastrophic operational and economic losses for companies in the supply chain network (Yan & Ji, 2020). Wang et al. (2017) found that Samsung lost an estimated $17 billion in revenues because of vendor phone battery production defects in 2016. The general business problem is that the lack of effective supply side management negatively effects profitability. The specific business problem is that some oil industry supply chain managers lack strategies to manage supply chain risks effectively.

The purpose of this qualitative multiple case study was to explore strategies that Jamaican oil industry supply chain managers use to manage supply chain risks effectively. The target population consisted of eight Jamaican supply chain managers working at different oil companies in Jamaica who have managed supply chains effectively. All supply chain managers chosen have successfully implemented risk management strategies for the oil companies they represented in the study. Study implications for positive social change include the potential to improve worker living standards by augmenting employee remuneration from increased profits realized from risk reduction. Additionally, the potential exists for the strengthening of the buying power of customers through the offer of higher quality products at affordable prices.

Population and Sampling

I selected a sample size of eight midlevel and senior level managers from at least 4 oil companies in Jamaica, who have successfully implemented risk management strategies in the oil supply chain. I used purposive sampling to select the participants. Purposive sampling is used to identify participants with the most knowledge on the study topic (Tunarosa & Glynn, 2017). Participants were identified from a list of eligible companies obtained from Jamaican government agency with responsibility for the oil industry. Participants were identified and contacted via email and telephone. Data was collected using the semistructured interview process. Semistructured interviews are an effective way to obtain adequate information on the study topic (Trang, 2022).

Nature of the Study

Researchers employ quantitative and qualitative methods as two primary ways to study phenomena (Park & Park 2016). A mixed methods study is a third approach that has gained increasing focus in recent times (Johnson, 2015). A qualitative approach is appropriate for this study. The qualitative method was selected because the research study goal was to understand and explore strategies that supply chain managers use to manage risks. The qualitative approach is exploratory research, which encapsulates the study of employees in their natural settings (Park & Park, 2016). Using the quantitative method allows researchers to focus on questions with a theoretical basis that seek to characterize variables or explain relationships among variables (Mayer, 2015). The quantitative approach was not appropriate for the study as the purpose of the study was to explore strategies and not to explain relationships between variables. A mixed methods approach integrates the best of the qualitative and quantitative research methods in the same study (Molina-Azorin et al., 2017). The mixed method approach was also not appropriate for the study since the study's purpose did not require using the quantitative method.

A qualitative multiple case study design was used for this supply chain risk management study. An embedded multiple case study was appropriate for this study as the study represented a case of particular interest. The objective of a multiple case study is to gain insight on everyday decisions which supply managers make to manage supply chain risks (Yin, 2018). Case study research is a valuable tool useful for clarifying complexities (Annansingh & Howell, 2016). A case study design is used to investigate

complex social issues from a real-life perspective, by studying people in their natural settings (Yin, 2018). A case study was the preferred design for the study as a case study design excels in gaining in-depth understanding of particular case domain. An in-depth understanding was needed to fulfill the study objective to identify and explore successful risk management strategies that supply chain managers use to effectively manage risk in the Jamaican oil distribution chain.

Other qualitative research designs I considered were phenomenological, grounded theory, and narrative research. Phenomenological researchers focus on exploring the personal meanings of participants' lived experiences (Willis et al., 2016). Phenomenological researchers seek to understand the extent to which humans shape their experiences by self-reflections (Willis et al., 2016). The phenomenological design includes a philosophical feature which emphasizes the use of intuitive experience to gain insights into the personal meanings of participants' experiencing a phenomenon (VanScoy & Evenstad, 2015). The focus of the phenomenological design makes the design inappropriate for this study as the study did not focus on exploring the personal meanings of participants' developing and deploying risk management strategies. Grounded theory researchers use sampling to develop theories for explaining phenomena (Johnson, 2015). A grounded theory design did not apply to this study as the study objective was to explore risk management strategies rather than to generate theories. The narrative qualitative design focuses on individuals' views on their personal lived experiences (Safari & Thilenius, 2013). A narrative design was also not suitable for this study, as the study sought to explore risk management strategies used by supply chain

managers, by studying supply chain managers in their natural setting, rather than sought individually provided personal stories through participants' narratives.

Research Question

What strategies do Jamaican oil supply chain managers use to manage supply chain risks effectively?

Interview Questions

1. What are the primary supply chain risks faced by your company?
2. Based upon your experiences, what are the drivers of the risks that exist in your company's supply chain?
3. Based upon your experiences, how have the risks you described affected your company's operations and performance?
4. What strategies do you employ to address these risks?
5. What challenges have you encountered in the implementation of the risk mitigation strategies?
6. How did your organization address the key challenges to implement the strategies for the mitigation of supply chain risks?
7. Based upon your experiences, how do the strategies that you employ mitigate these supply chain risks?
8. What additional information, if any, would you like to share on the strategies that you use to mitigate risks in the supply and distribution process of your organization's supply chain?

Conceptual Framework

The basic theory that underpins the conceptual framework for the proposed study is the structural contingency theory of fit. Van de Van and Drazin (1985) formulated the structural contingency theory of fit on the premise that the fit between an organization's structure and its internal and external environments will influence performance. Anchored by the structural contingency theory first set forth in the 1950s, the relationship between organizational structure and organizational contingencies will determine firm performance level (Morton & Hu, 2008; Sayilar, 2016). Selection, interaction, and systems approaches are key concepts which underlie the contingency theory of fit (Van de Ven & Drazin, 1985). Embedded in contingency theory is the assumption that context, structure, and performance of the organization should be viewed as an interdependent system in the management of the firm (Wagner & Bode, 2008).

Contingency theory considers the effect of internal and external factors such as risks, on firms' performance (Ali & Shukran, 2016). Risks are inherent in supply chains and manifest in various ways especially when there is insufficient information for decision-making, market changes, and the presence of natural disasters (Flynn et al., 2016). The application of contingency theory to explore supply chain risk mitigation strategies is appropriate, as there is no single methodology for risk management in the supply chain (Chang et al., 2015).

The contingency theory of fit is therefore expected to be applicable to the proposed study for identifying and understanding the strategies the participating organization used to mitigate risks and to improve the performance of the supply chain.

Operational Definitions

Global sourcing: The integration and coordination of a network of suppliers across international borders to affect the procurement of goods and services (Wieland et al., 2020).

Global supply chain: The integration of external and internal stakeholders in a global network to enable the coordination of all activities in the production process to obtain operational and financial benefits for all the players in the supply chain (Chu et al., 2020).

Risk management: The identification, monitoring, and mitigation of risks surging from the activities of focal organizations, to ensure a reduction in potential losses and enhanced competitiveness (Prashar & Aggarwal, 2020).

Risk management strategies: The development of an understanding of the triggers that lead to the propagation of risks during the early stages of the risks' presence and the implementation of mechanisms to address the risks to prevent disruption and improve economic gains (Deng et al., 2019).

Supply chain collaboration: The partnership process by which two or more organizations work together, leveraging the knowledge and resources available to achieve a common goal in the supply chain, and strengthen their competitive position (Liao et al., 2017).

Supply chain disruptions: The unplanned and unanticipated occurrences which adversely impact a supply chain by prevent the normal supply of goods and services (Carbonara & Pellegrina, 2018).

Supply chain resilience: The capacity to identify strategies which improve an organization's response to supply chain disruptions, while ensuring quick recovery to the organization's original or improved state (Shekarian & Mellat Parast, 2021).

Supply chain risks: Any threat or fluctuation that may potentially disrupt supply and demand and adversely affect the supply chain (Nooraie et al., 2020).

Supply chain risk management: A response mechanism that supply chain players employ to identify, assess, and manage the uncertainties, which could negatively affect the supply chain (Fan & Stevenson, 2018).

Assumptions, Limitations, and Delimitations

This section provides a discussion on the assumptions, limitations, and delimitations of the study. Assumptions are components of the study which are deemed to be out of the researcher's control (Givens, 2008). Limitations are possible weaknesses of the study that the researcher is unable to control (Yin, 2017). Delimitations are within the researcher's control and used to define the boundaries of the study (Givens, 2008).

Assumptions

Assumptions are facts considered to be true but are not actually verified. Assumptions carry risk and should be treated as such. A mitigation discussion would be appropriate.

Limitations

Assumptions are an acceptance of something as truth without theoretical proof (Schoenung & Dikova, 2016). One assumption of the study was that the participants selected are the most knowledgeable about effective risk management strategies in the oil

supply chain. Another assumption was that the participants would provide honest and detailed responses to the interview questions. A third assumption was that the company would provide all the relevant documents for review as part of the data collection process.

Delimitations

Delimitations are the boundaries which the researcher establishes to meet the objectives of the study (Theofanidis & Fountouki, 2018). I selected a sample of eight midlevel and senior level managers from multiple oil companies in Jamaica as a study delimitation. Managers with less than 5 years' experience in supply chain management were not. Data were collected from interviews and notes taking to gain an in depth understanding of the strategies used to effectively manage risks and improve profitability in the oil supply chain.

Significance of the Study

The study was significant in three significant ways, (a) value to the business, (b) contribution to the business practice, and (c) implications for social change. Business practitioners may consider the effects that the mismanagement of supply chain risks can have on profitability. Employees and customers within an oil supply chain might perceive the study worthwhile as the efficacy of risk handling strategies affect product quality and the quality of life.

Contribution to Business Practice

Oil industry practitioners might benefit from the findings of this study to improve supply chain operations and overall business performance. Greater distances,

complexities, and disruption possibilities typify supply chain challenges, which underpin the importance of developing and applying appropriate strategies for risk management (Chang et al., 2015). By implementing risk reduction strategies, supply chain managers can reduce supply chain costs, improve the quality of products, reduce the delivery time to customers, and increase profitability. Cost reduction and improvements in product quality and delivery time can strengthen customer loyalty and retention, further enhance the growth of the business, and foster the realization of competitive advantage. Additionally, organizations can employ the use of knowledge management resources in addressing key stakeholders' needs to improve collaboration, reduce risks, and boost firms' responsiveness to customers' demands and enhance profitability (Cantor et al., 2014). Supply chain managers can use risk management as a mitigation tool and a methodology for creating value for both business and stakeholders (Trkman et al., 2016).

Implications for Social Change

Study implications for social change include improved standard of living for employees and increased buying power for employees and customers, both generated by offering better quality products at more affordable prices. Applying mitigation strategies such as collaborative planning and stringent quality checks can lead to more efficient operations by the improvement of time and quality concerns in the supply chain system (Micheli et al., 2014). Additionally, as supply chains become more profitable through risk mitigation, organizations can effect social change through job creation and economic growth. Successful organizations can enhance social conditions by creating jobs,

engaging in environmentally sustainable activities, and supporting economic growth (Polonsky et al., 2016).

A Review of the Professional and Academic Literature

In this review, I will present a composition of articles on supply chain risk management, to support the intent of my study. The purpose of my study was to explore strategies used by supply chain managers to mitigate risks in the Jamaican oil industry. The key search terms used for the purpose of this review included (a) supply chain management, (b) supply chain disruption, (c) supply chain risks, (d) supply chain risk mitigation, (e) risk management strategies, (f) innovation (g) strategic management, (h) organizational performance, and (i) contingency theory. The structure of this review entails, firstly, a discussion on the conceptual framework which is relevant to the management of supply chain risks. A comprehensive discussion on the following categories will follow: (a) supply chain risk management, (b) collaboration, (c), sourcing, (d) innovation, and (e) supply chain resilience. Different sub-headings will highlight the different components of supply chain risk management, with a focus on the relevance to the oil industry, where applicable. In conclusion, I will present a synthesis of the findings from the literature reviewed, highlighting any gap identified in the available information.

The Supporting Concept

My review of the different theories which are relevant to the management of supply chain risks led to the selection of the contingency theory of fit as the conceptual framework which supports the effective management of supply chain risks. The existence of different risk management tools does not assist in the elimination of supply chain risks.

Talluri et al. (2013) posited that researchers could apply the contingency theory to the supply chains to better understand how to use different strategies to mitigate risks and improve performance. The formulation of the contingency theory is on the premise that a firm's performance is dependent on the fit between the firm's structure and the internal and external environment (Van de Van and Drazin, 1985).

As supply chain managers encounter challenges, internally and externally, which could affect the performance of the organization, it is important that the response to said challenges result in positive outcomes. Contingency theorists see organizations as open frameworks which share information through a procedure of input, process, and output (Schoonhoven, 1981). Grötsch et al. (2013) define the inputs as contextual problems which an organization will face externally and internally. The process is the organization's reactions to the internal and external issues and the resulting outcome signifies the output (Grötsch et al., 2013). An integral part of the response is also in the structure of the organization.

Risk mitigation strategies could emerge from the various contingencies that may exist in the supply chain. The contingency theory is relevant in the determination of mitigation strategies within the supply chain, based on the numerous ways to respond to supply chain risks (Trkman & McCormack, 2009). Central to the contingency theory is the premise that managers should consider contextual factors in the determination and the execution of the strategies to attain effectiveness and improved results (Wagner & Bode, 2008). The organization of the business in contingencies will determine the organization's performance level (Morton & Hu, 2008). Varying contingencies,

including environmental contingency factors, such as the industry, and strategic contingency factors, such as the organizational design play a role in the organizational performance (Smith et al., 2019). The environmental complexities and competition are considerations for managers who are seeking to improve the performance of the organization (Williams et al., 2017). Williams et al. (2017) further asserted that internally, managers have to contend with issues of leadership and control as part of the structural challenges, which represent other potential contingencies in the supply chain. As managers consider the different contingencies that are present in the operations, strategic performance management systems, coupled with a differentiation strategy, can be useful in the creation of value and the establishment of organizational control to enhance performance (Siska, 2018).

In conjunction with the underpinnings of the contingency theory, an assessment of the situational factors is essential to the selection of the most suitable risk management strategy ("A contextual approach to supply chain risk mitigation," 2015). Situational factors, which include an understanding of the different internal and external activities which affect an organization, should lead to effective planning and the appropriate response in the mitigation of supply chain risks. In addition to the situational factors, the timeliness of the response is also significant in the determination of the outcome. Scholars have outlined that while the reactive response to managing supply chain risks is ubiquitous among managers, a reactive approach is inadequate to prevent a recurrence of the challenges associated with the risks (Grötsch et al., 2013). It is necessary for

managers to determine whether a proactive or reactive approach is more suitable in the development of risk management strategies.

The relevance of the contingency theory to risk mitigation lies in the viewpoint that there are numerous responses to supply chain risks (Trkman & McCormack, 2019). Talluri et al. (2013) also supported the use of the contingency theory by researchers to better understand the use of risk management strategies to improve the performance of a firm. The sensitivity of supply chains in response to global instability is evident in the supply chain disruptions (Wagner & Bode, 2008). It is therefore crucial for firms to be more vigorous in the approach to manage supply chain risks.

Supply Chain Risk Management

A holistic appreciation for supply chain operations from the supplier to the end customer is important to the management of the supply chain (Olson, 2018). Global supply chain management is the process by which goods and service move from the point of origin to the end user (Tannous & Seongno, 2018). The activities in a supply chain includes sourcing, inventory management, timeliness, and the fit into the organization (Waqas et al., 2019). The objective of the supply chain is to establish alignment between internal and external activities of the chain with the ultimate goal of value creation (Shahbaz et al., 2019).

Inherent in the supply chain process is the presence of risks. There are varying definitions for the concept of risk. The classical decision theory outlines that risk encompasses the possibility of outcomes and their consequential value and impact (March and Shapira, 1987). A supply chain risk is defined as any deviation which occurs

because of supply chain disruptions and adversely impacts normal operations (Chang et al., 2015; Wagner & Bode, 2008). Similarly, Rao and Goldsby (2009) defined supply chain risks as the effect of negative or positive eventualities, and unfavorable consequences which cause the organization to underperform. Supply chain risks refer to the probability of incorrect decisions due to environmental variations and unpredictable activities among supply chain players (Revilla & Saenz, 2017). These variations can have an effect on the most important components of the supply chain network, including supplies and finances (Boonyanusith & Jittamai, 2019; Ssan & Goh, 2017). Supply chain risks are present because of the unpredictability of future events which can occur anytime (Aqlam & Lam, 2016). Unexpected occurrences affect individual companies, and by extension, the entire supply chain (Kauppi et al.2016), making risk management an important feature of the supply chain (Blome & Schoenherr, 2011). Supply chain risks can result from decisions about suppliers and inventory (Thun & Hoenig, 2011). Other sources of risks include political, economic, and other uncontrollable factors, which are external to the supply chain activities (Peck, 2005). Disruption risks represent a significant share of the supply chain challenges (Kauppi et al., 2016). Supply chain disruptions can have an undesirable effect on the supply chain operations (Chen et al., 2017), causing significant operational and financial losses. The varying definitions of supply chain risks indicate in summary that mismanaged risks could lead to supply chain disruptions. Supply chain disruptions, which result from unplanned events such as natural disasters and economic challenges, interrupt the flow of goods along the supply chain and cause losses to individual firms and the supply chain (Chen et al., 2017). These

disruptions can halt the supply chain processes, increase costs, reduce revenue, and put the organization's competitive advantage at risk (Revilla & Saenz, 2017).

Risk identification is a key element in the effective management of risks (Shahbaz, et al., 2019). The identification of risk sources is fundamental to arming decision makers with the knowledge required for the effective management of the risks (Vilko et al., 2019). There is a direct link between the proper identification, assessment, and prevention of risks, and the success of the supply chain (Shahbaz et al., 2019). Supply chains are susceptible to increased risks and disruptions due to the associated complexities and uncertainties (Park et al., 2016). The ubiquity of risks in the supply chain surges from the increasing competition in the business environment (Waqas et al., 2019). The increase in supply chain risks is congruent with the increase in supply chain complexities (Vilko et al., 2014). As an example, the proliferation of risks and disruptions in supply, can lead to unfavorable outcomes (Friday et al., 2018). Supply chain issues can result in increased costs, which, can negatively impact revenues and market share (Kumar et al., 2018). There are increased challenges and risks in the supply chains due to global expansion and structural changes of firms (Behzadi et al., 2018). The very nature of the supply chain, which has the process of buying at the core, allows for the generation of risks (Chaudhuri et al., 2018). As such, many researchers are seeking to understand and identify the sources of supply chain risks. In the face of globalization, supply chains have become exposed to increased risks and reduced profitability. Researchers have therefore garnered an interest in understanding these supply chain risks and how they can be mitigated (Baryannis et al., 2019).

Risk sources are an integral part of risk management (Rao & Goldsby, 2019). Sources of risks in the supply chain are varied. There can be risks associated with changes in supply and demand, political and environmental factors, as well as unforeseen catastrophes (Rajagopal et al., 2017). Habermann et al. (2015) identified three primary types of supply chain risks, namely supplier risk, internal risk, and customer risk.

Risk management is a focal point for managers and researchers due to the proliferation of complexities and risks in the supply chain (Kauppi et al., 2016). Researchers and practitioners have an increased interest in supply chain risk management based on the presence of vulnerabilities and the adverse effects of disruptions (Gouda & Saranga, 2018). A key component of managing a supply chain is an understanding of the risks as risk is a threat to the performance of supply chains (Brusset & Teller, 2017). In the era of globalization, as businesses continue to grow and expand into other territories, it is necessary for organizations to garner knowledge about the existing risks and how to mitigate them (Shahbaz et al., 2019). Supply chain risk management encompasses the capability to identify, assess, and manage risks in a changing environment to remain competitive and viable (Kilubi & Rogers, 2018; Jüttner & Maklan, 2011). Kilubi (2016a) described supply chain risk management as the process by which strategies are implemented to manage or control threats in the supply chain. The purpose of supply chain risk management is to understand the affect of risks and develop mechanisms to respond to and prevent risks (Er Kara et al., 2020). Supply chain risk management is necessary to reduce the impact of disruption of the supply chain activities (Siagiani et al., 2018).

In the extant literature on supply chain risk management, there is evidence of the proposal of several risk management tools, geared at minimizing supply chain risks (Vanalle et al., 2020). The proper implementation of any risk management tool is essential to ensuring the successful management of risks. It is also important that firms have the required abilities to manage risks. Firms lacking the requisite capabilities cannot implement a consolidation of risk management strategies (Rajesh, 2017). Many managers encounter the challenge of effectively managing risks to reduce losses and increase profits (Luo et al., 2019). The burgeoning complexities of supply chains make it challenging for supply chain managers to manage the supply chain effectively, even with the implementation of a myriad of risk management strategies (Gouda & Saranga, 2018). The mismanagement of supply chain risks can adversely affect the performance of the supply chain (Jafarnejad et al., 2019). Hence, there is a need for effective risk management strategies. Effective risk management is contingent on a complete understanding of the types of risks, the sources, and the triggers for these risks (Boonyanusith & Jittamai, 2019). Organizations, which foster an atmosphere of open communication, collaboration, and innovation, could be more effective at the implementation of risk management strategies.

It is necessary that decisionmakers have complete understanding of their capabilities to support the implementation of various risk management practices. The investment in supply chain risk management is incongruent with the potential benefits although there is acceptance of the positive correlation between supply chain risk

management and improved competitiveness, sustainability, and resilience (Hernandez & Haddud, 2018).

Contrary to the extant literature, there is no systematic use of the management tools to address supply chain risks in some supply chain (Vanalle et al, 2020). The management of risks may require modification to the supply chain and the reallocation of resources, which can further exacerbate the magnitude of any disruption (Christopher & Holweg, 2017). Supply chain risk management strategies are either proactive or reactive. The response to vulnerabilities in the supply chain, as part of the risk management strategy, can be proactive or reactive (Abeysekara et al., 2019). Managers typically used a reactive approach to risk management until recently, when there is a thrust towards a proactive approach (Colicchia & Strozzi, 2012). Some researchers believe that there is more value in a proactive approach. A proactive approach to risk management entails the identification and understanding of the risks (Govindan & Chandhurri, 2016), to prevent disruptions. Firms which can effectively predict and prevent supply chain risks are better able to minimize losses (Baryannis et al., 2019).

Some of the risk management strategies used in the supply chain surround a focus on sourcing, inventory management, contracting, and collaboration (Ghadge et al., 2017). It is important for firms to understand the strategies available for risk management and how to effectively use those strategies to improve performance (Kauppi et al., 2016). The success of the strategies employed depends on the stability and flexibility of the organization. Supply chains which are established, and exhibit stability are in a better position to effectively manage supply chain risks (Rajesh, 2017). Similarly, the flexibility

of an organization will determine the effectiveness of the strategies used risk management (Aqlan & Lam, 2016). Supply chain risk management also encapsulates the management of a range of other possible risk areas such as logistics risks, sourcing risks, and production risks (Govindan & Chandhuri, 2016).

Resilient supply chains are better able to withstand the effects of supply chain disruptions. Supply chains are susceptible to disruptions, based on their natural exposure to varying risks including cost and quality issues (Jafarnejad et al., 2019). Exposure to disruptions can be beneficial in allowing firms to gain the necessary knowledge to improve their capabilities to respond to any future occurrence (Revilla & Saenz, 2017). Resilience in the supply chain is therefore a necessary goal. Due to the growth of global supply systems, there is an urgent need for the strengthening of supply chains to make them resilient with the capacity to have expeditious return to normalcy in the face of disruptions (Chang et al., 2015). A successful supply chain is resilient and has the capacity to effectively manage external and internal challenges (Abeysekara et al., 2019).

The internal and external environment is also important in the context of supply chain risk management. Firms will strengthen their internal structures, while simultaneously garnering information on the external environment, in response to the observed risks (Kauppi et al., 2016). Notwithstanding the gathering of information on the external environment, Taylor and Vachon (2018) found that there was less focus on the performance of companies in relation to environmental and social concerns. Companies typically consider environmental and social concerns reactively, based on a push from stakeholders (Rajesh, 2019). Stakeholders have taken a heightened interest in demanding

sustainable products from companies (Gualandris et al., 2015). Companies can achieve sustainable competitive advantage if consideration is given to the environmental and social contexts of supply chains (Rajesh, 2019).

Collaboration

Collaboration is one strategy which is critical to combat risks in the supply chain. In the age of globalization, the establishment of alliances is an important risk aversion tactic (Milovanovic et al., 2017). Traditionally, the activities internal to the organization were the primary focus of risk management strategies, but trending today, supply chain partners are extending their efforts to include collaboration with key stakeholders (Revilla & Saenz, 2017). Ho et al. (2015) highlighted the role of collaboration in the supply chain, by defining supply chain risk management as a collaborative effort for all organizations in the chain.

Collaboration is an important element in the mitigation of supply chain risks and also in the improvement in profitability (Hernandez & Haddud, 2018). Tang (2006) encouraged the use of a collaboration as a mitigating mechanism in line with the proactive approach. The management of risks at the supply chain level stems from the realization that companies are facing a lot of risks associated with their supply chain partners (Yen & Zeng, 2017). Hence, there is a thrust to have a coordinated collaborative approach to risk management across companies in the supply chain. In the supply chain, collaboration is useful for planning and forecasting purposes and increases the opportunities to reduce supply chain vulnerabilities (Rajesh, 2017). The approach to developing collaboration can be vertical, with customers, suppliers, and internal interests,

or horizontal, with competitors and noncompetitors (Abesekara et al., 2019). Current literature outlined the need for and benefits of supply chain relationships (Mocke et al., 2016). Supply chain players may not have proper visibility of the risks they encounter, due to the decentralization and sharing of the risk management responsibilities (Vilko et al., 2019). It is therefore necessary that the supply chain players leverage the relationships which exist and engage in collaboration to manage the risks. Strong relationships between suppliers and buyers are necessary for the successful management of supply chain risks (Wandfluh et al., 2016). Getele et al. (2019) found that alliances with government agencies and interagency partnerships within the supply chain network had a positive effect on risk mitigation.

Collaboration enhances supply chain performance (Wu et al., 2014) and can improve response time. Through information and knowledge sharing, supply chain managers can learn to better manage risk and improve the sustainability of their organizations and the entire supply chain. Information and knowledge sharing, inter and intra organizational alignment are essential to effective collaboration (de Almeida et al., 2017). External collaboration can enhance the sharing of information about risks to increase the risk management capabilities. (Kauppi et al., 2016). The sharing of information would increase knowledge about risks among the supply chain partners and assist with the development of appropriate management strategies (Waqas et al., 2019). The effective management of risks in supply chain requires a coordinated approach. Risk sharing and information sharing are key aspects of collaboration in the supply chain (Li et al., 2015). Stakeholders could increase their knowledge of uncertainties and

vulnerabilities in the supply chain through risk information sharing, which would enable the awareness of the appropriate mitigation actions to take against risks and disruptions (Friday et al., 2018). Companies should utilize the collaborative mechanism to leverage the strong ties that exist in the supply chain to improve the sharing of information for the benefit of the entire supply chain (Chen et al., 2017). The exchange of information, skills, and experiences, and collaborating on decisions and tasks execution can improve response time (Jafarnejad et al., 2019). Supply chain integration will increase the efficacy of supply chain risk management (Kauppi et al., 2016; Li et al., 2015), through the fostering of information sharing. Engaging in alliances will help to foster knowledge sharing and ultimately lead to improved performance (Chaudhuri et al., 2018).

Trust and commitment will enhance the effectiveness of collaboration, which can have a positive impact on an organization's competitive advantage (Kamalahmadi & Parast, 2016a). Li et al. (2015) asserted that relationship, trust, and knowledge sharing are beneficial to a company's financial growth. Similarly, commitment is a critical underpinning of a collaborative relationship (Govindan & Chandhuri, 2016). Transparency in the supply chain will build trust among partners and improve the resilience of the supply chain (Rajesh, 2017).

A collaborative approach to monitor the internal and external environments, and collectively determine the need for intervention, can result in risk reductions which benefit the entire supply chain (Ali & Shukran, 2016). De Almeida et al. (2017) highlighted the importance of internal and external collaboration to stabilize demand in the supply chain. Collaboration between internal and external stakeholders is a catalyst to

value creation and customer satisfaction (Thiruvattal, 2017). Risk management strategies can be effective with the coordinated efforts of all supply chain partners and decisionmakers (Ali & Shukran, 2016). Firms should be cognizant of the positive impact of collaboration internally and externally, in creating value and improving performance (Tannous & Seongno, 2018).

There is also the need for communication (Cho et al., 2017) to improve the effectiveness of collaboration. Collaboration between suppliers and buyers can enhance the effective management of supply chain risks (Breuer et al., 2013) through frequent communication. Communication between buyers and suppliers is a valuable component to supply chain risk management (Uys et al., 2019). Similarly, the involvement of decisionmakers in the supply chain risk management process can result in tremendous benefits (Ingley & Walt, 2008). Inter and intra organizational communication networks are important aspects of supply chain management (Siagian et al., 2018). Inter and intra organizational collaboration will help to foster greater communication internally, and externally thereby enhancing performance (Caniato, et al., 2016).

Companies can gain synergies from the relationships established in the supply chain, to have a holistic positive impact on the organization. The organization as well as the entire supply chain would benefit from the application of a holistic risk management strategy (Vilko et al., 2019). The development of strategic interorganizational relationships gives credence to the value of using collaboration as a risk management strategy (Friday et al., 2018). Revilla and Saenz (2017) recommended the use of collaborative risk management to strengthen interorganizational relationships and

improve the assessment and management of supply chain risks. Through collaborative risk management, the opportunity is created for the application of risk management on a global level, with input from all the stakeholders (Friday et al., 2018). Additionally, it is essential for supply chain managers to pursue collaboration with other supply chain partners to create supply chain resilience and the resultant benefits for customers and suppliers (Blessley & Mudambi, 2022).

Decision makers should also consider the benefits of collaboration in their sourcing decisions by incorporating trust and commitment. The development of strategic long-term relationships with suppliers and service providers will be beneficial to the performance of the supply chain (Govindan & Chandhuri, 2016). The success of long-term relationships with suppliers globally depends on the level of trust and commitment. Trust and commitment are key factors in the success of collaboration with foreign suppliers. (Manoj & Urvashi, 2017). Collaboration between suppliers and buyers, that is characterized by trust and commitment, is effective against supply disruptions and can aid the suppliers in the acceleration of their recovery in the event of a disruption (Namdar et al., 2018).

The use of collaboration to address supply and demand risks can be valuable to the supply chain (Chen et al., 2013). Some researchers asserted that while collaboration leads to considerable benefits, there is also increased exposure to some risks (Shahbaz et al., 2019). The lack of cooperation of some supply partners could present a grave challenge to the supply chain (Basole et al., 2016) as supply risks become prevalent. Increased dependence on supply chain partners will augment the risk exposure and

effects in the supply chain (Revilla & Saenz, 2017). Ghadge et al. (2017) recommended the use of a supply chain contract to hold suppliers accountable and to guarantee benefits from improved performance in the supply chain. The purpose of the supply chain contract is to facilitate the sharing of the risks associated with price and demand uncertainties, as well as other unknown risks (Ghadge et al., 2017).

The implementation of standardized management systems can strengthen collaboration. Zimon and Madzik, (2020) found the implementation of standardized management systems as a useful strategy in supply chain risk management. Standardized management systems promote collaboration and process integration in the supply chain, leading to improved performance (Zimon & Madzik, 2020). The absence of collaboration can render the risk management efforts ineffective (Revilla & Saenz, 2017). According to Tannous and Seongno (2018), collaboration is one of the pillars on which companies should develop global supply chain management to minimize supply chain risks. Supply chain managers rely on close collaboration among stakeholders to enhance performance (Li et al., 2015). Successful firms leverage the partnerships which exist to effectively manage supply chain risks (Kilubi & Rogers, 2018). The lack of synergy among supply chain partners is a factor which impacts the effective management of supply chain risks (Meyer et al., 2019). Collaboration requires deliberate actions in the supply chain. Partners should be unified in purpose and objective for the success of the relationship (Spence et al., 2018). Firms will benefit economically from the unification among supply chain partners, which enhances competitive advantage (Zhu et al., 2017). Supply chain partners should facilitate a joint understanding of the supply chain susceptibilities to

develop a coordinated approach which will improve the outcome of risk exposure (Revilla & Saenz, 2017). The benefits of collaboration outline in the literature indicate that it is imperative that supply chain partners leverage the collaborative opportunities to develop viable risk management strategies.

Sourcing

Sourcing is now becoming a strategic tactic used to manage supply risks (Kumar et al., 2018). Sourcing strategies are important to the performance of the supply chain. The successful performance of a supply chain is contingent on the selection of the right suppliers (Namdar et al., 2018). There are various sourcing options which are available to purchasers in the supply chain. Sourcing options include the use of a single sourcing, multiple sourcing (Namdar et al., 2018), or dual sourcing (Kumar et al., 2018). According to Namdar et al. (2018), single supplier sourcing is the preferred option for some companies as it is deemed secure and controlled. Whether a company decides on a single supplier or multiple suppliers, the decision to purchase locally or globally is also important.

Global sourcing is a favorable strategy to practitioners because of the potential cost, labor, and governmental support which organizations derive from using this approach (Hernandez & Haddud, 2018). Through global sourcing, organizations can benefit from innovation and labor force expertise (Capolupo et al., 2017). Global sourcing can also result in increased risks. Cultural differences and lack of control over organizations in other jurisdictions can trigger risks (El Fadil & St-Pierre, 2016) which are more costly than any potential benefit (Hernandez & Haddud, 2018). Notwithstanding

the possible shortcomings of global sourcing, Rogers and Rodrigo (2015) found that organizations can benefit from the availability of skilled labor and a reduction in operational cost.

To address sourcing risks, some researchers proposed the use of routine sourcing and contingent sourcing as mitigation strategies (Freeman et al., 2018). Routine sourcing encompasses the use of a supply base of multiple suppliers for the purchase of specific goods (Freeman et al., 2018). The use of a backup supplier as well as simultaneous purchase and production of some items, in the event of disruptions is considered contingent sourcing (contingent rerouting) (Snyder, et al., 2016). Merzifonluoglu (2017) asserted that the use of backup suppliers enhances the company's response to unforeseen supply interruptions.

The strategies used to determine the purchase of goods and services will help to influence the organization's viability (Merzifonluoglu, 2015). Although supplier reliability and resilience are two key requirements for the success of retailers (Kumar, et al., 2018), in some cases, cost played a greater role than reliability in the selection of suppliers (Snyder et al., 2016).

Suppliers are integral to the successful performance of the supply chain. Suppliers who are fallible can cause instability along the supply chain and therefore requires careful selection and monitoring (Pertheban & Arokiasamy, 2019). The impact of supply issues can be far-reaching, resulting in quality and reliability issues and general upheaval in the supply chain (Waqas et al., 2019). It is imperative that firms implement the sourcing strategies which will ensure the availability of supplies in the event of a

disruption (Namdar et al., 2018). Sourcing selection can increase the organization's exposure to greater disruption risks (Namdar et al., 2018).

Innovation

Managers could use innovation as an appropriate response to supply chain disruptions. As complexities pervade the global economy, organizations focus on innovation as a competitive strategy (Afraz et al., 2021). Consequently, firms can leverage innovation as a strategy to improve their supply chains (Seuring & Miller, 2008). Innovation is an important strategy in ensuring sustainability and growth in organizations (Ni et al., 2021). As businesses encounter uncertainties, instabilities, and increased competition, it is important that they develop new operational strategies (Afraz et al., 2021). Innovation is becoming a major driver of change in the supply chain as organizations become more sophisticated in the operations and business strategies (Hopkins, 2021).

A company can use innovation in varying forms to address product or process risks. Supply chain innovation can be characterized into two dimensions: product innovation and process innovation (Lee & Schmidt, 2017). The key activities of supply chain innovation include logistics oriented, marketing oriented, and technological development-oriented activities (Wong & Ngai, 2019), all focused on product and process improvements. Supply chain innovation boosts process and operational improvements and strengthens the risk management capabilities in the organization by enabling the development of novel ways to manage supply chain activities (Afraz et al., 2021) and the quality of products. Innovation quantity and innovation quality influences

value creation and competitiveness in the supply chain (Yu et al., 2019). Wadho and Chaudhry (2018) asserted that it is necessary for organizations to incorporate innovation as part of the strategy to create efficiencies and drive customer satisfaction. In deciding on the use of innovation as a measure against supply chain disruptions, managers should give consideration to the use of the most applicable form of innovation (Kach et al., 2016).

The innovative capability of an organization exists primarily in its external network, driving the need for collaboration (Krishnan et al., 2021). Innovation requires a collaborative effort of stakeholders within and outside of the supply chain. Haus-Reve et al. (2019) found that innovation existed predominantly among firms, which collaborate with other supply chain stakeholders. The sharing of information, risks, benefits, and decision-making roles, create the platform for progressive innovation (Nguyen et al., 2019). In a multiproduct supply chain network, supply chain stakeholders benefit from the use of shared skills and resources through collaborative innovation (Wang & Hu, 2020). The distribution of information and knowledge throughout the supply chain network may promote innovation and stimulate the development of innovative products.

Some organizations are employing the extensive use of data in supply chain risk management (Er Kara et al., 2020). Data management strategies can be used in any risk management approach being employed, whether proactive or reactive (Lee et al., 2017). Technological developments underlie the drive for supply chain managers to use data driven techniques in managing supply chain risks (Er Kara et al., 2020). More research is required on the use of data management-based framework for supply chain risk

management. Although supply chain innovation has an operational focus and provide incremental business model improvements, large companies can use supply chain innovation to generate complementary business models for their existing methods (Abdelkafi & Pero, 2018). Hahn (2020) found that established companies integrate digital technology in their current business architecture. An emerging approach in the supply chain is that organizations are taking a holistic rather than an individualistic interest in innovation to counteract the intense global competition (Song et al., 2021). The upsurge of new technologies and valuable digital tools promote the joint use of innovation among organizations to better manage their operations (Ge et al., 2021).

Supply chain managers should use emerging technologies to enhance their leadership capabilities (Liu et al., 2021). The implementation of successful innovation depends on the ability of the organization to identify and remove barriers which may hinder the correct combination of the requisite finances, skills, and collaborative relationships (Gupta et al., 2020). Similarly, the effectiveness of innovation depends largely on the ability of the organization to ensure continuity in the development of innovative activities (Ferreira & Moreira, 2020). Innovation is integral to the achievement of competitive advantage (Teece, 2018). Additionally, innovative solutions foster dynamism and improvements in supply chain management (Aviggiolo & Ughetto, 2019) and the innovative capability of an organization is an enabler for customer satisfaction (Afraz et al., 2021).

Supply Chain Resilience

Practitioners deem supply chain resilience as an important capability in the management of risks and disruptions (Al-Hakimi, et al., 2021). The inevitability and unpredictability of supply chain disruption highlights the need for supply chains to be responsive to a dynamic environment (Li & Zobel, 2020). Supply chain resilience, characterized by the effective success and risk mitigation capabilities, is essential to the management of unforeseeable supply chain disruptions (Um & Han, 2021). Resilience encapsulates the response, recovery, and resistance to a disruption (Li et al., 2020). Resilience is the ability of a firm to survive disruptions by surviving the consequences without affecting its original state (Agigi et al., 2018). Andrews (2019) characterized resilience as the presence of strength and flexibility which allows for resistance to disruptions. It is important that supply chains attain resilience to withstand disruptions and mitigate risks. Resilient supply chains would be better able to withstand supply chain disruptions and gain sustainable competitive advantage (Getele et al., 2019; Rajesh, 2019). Bogataj et al. (2016) found that supply chains can remain resilient in the presence of disruptions if, they have reserved liquidity, invest in insurance, and establish lines of credit for use in the period of disruption. Supply chain managers have the task of ensuring that they have the requisite resources to return the supply chain to normalcy in the event of disruptions (Bogataj et al., 2016). Brusset and Teller (2017) posited that supply chain managers are responsible for the decisions, tools, and processes necessary for the achievement of supply chain resilience. Changes in the business environment may lead to disruptions, which threaten the stability of supply chains, and create exposure to

risks and uncertainties (Al-Hakimi et al., 2021). The role of supply chain resilience in the mitigation of supply chain risks has emerged as a significant area of interest for researchers and supply chain managers (Mena, Melnyk, Baghersad, & Zobel, 2020).

Supply chain resilience is a multidimensional concept including proactive capability, reactive capability, and network design quality (Chowdhury & Quaddus, 2017). According to Alikhani et al. (2021), proactive resilience capabilities involve the use of an identification and response mechanism for risk impact before it happens. Reactive resilience includes an organizations' ability to recover from the impact of the risk and return to normalcy. Network design resilience is related to node density in a specific area. Human capital plays a strategic role in the management of the supply chain (Bals et al., 2019) and the determination of the achievement of any or all dimensions of supply chain resilience. Nikookar and Yanadori (2021) found that the relationships between supply chain managers and their counterparts are critical to the visibility, responsiveness, and flexibility of the supply chain, important antecedents of supply chain resilience. Resilient supply chains should explore various types of resilience capabilities to benefit from the embedded synergies (Adobar & McMullen, 2018).

The ubiquity of supply chain disruptions due to natural disasters, trade wars, and pandemics, makes supply chain resilience a topic interest to practitioners and academicians (Blessley & Mudambi, 2022). Scholars and practitioners have increased their focus on supply chain resilience due to the recent supply chain collapses, triggered by the COVID-19 pandemic (Moosavi & Hosseini, 2021). During the pandemic, supply chains became vulnerable due to delivery delays, suppliers' inability to fulfill demand,

plants closure, and unpredictable customer demands (Ivanov, 2020). The COVID-19 pandemic exposed the vulnerabilities of supply chains and created significant challenges for suppliers to meet demands and other obligations (Spieske & Birkel, 2021). The catastrophic effects of the Covid-19 pandemic on supply chains far outweighs the effects of other disruptions such as natural disasters in other countries (Moosavi & Hosseini, 2021). Nikookar and Yanadori (2021) posited that the COVID-19 pandemic augmented the uncertainties and complexities of the supply chains, causing unprecedented levels of disruptions and further eroded revenues for a lot of firms.

Companies can use technology to build resilience and strengthen their competitiveness. With the requisite technological capabilities, companies can build resilience and create a culture to support their longevity (Rajesh, 2017). Gu et al. (2021) found that the use of information technology (IT) in the supply chain can build customer and supplier resilience and by extension improve the performance of the supply chain. The implementation of IT capabilities will enhance a collaborative effort in the management of supply chain disruptions, as such capabilities foster the development of novel and immediate solutions.

Implementation costs is a factor which impacts the effective management of supply chain risks (Meyer et al., 2019) and the attainment of resilience Supply chain managers may have to consider the limitations of a budget in making decisions which are in alignment with building resilience in the supply chain (Li & Zobel, 2020). The implementation cost of resilience strategies and the potential efficacy can make strategy selection a complex process (Alikhani et al., 2021). Additionally, time required for a

supply chain to return to normalcy after a disruption, or time to recovery is an important element in the consideration of resilience (Behzadi & Olsen, 2020).

The main objective of supply chain resilience is to ensure speedy recovery from disruptions (Spieske & Birkel, 2021) and ensure business continuity. Business continuity has a mitigating influence on supply chain disruptions on the operations of the supply chain and enhances supply chain resilience (Riglietti et al., 2021). Notably, companies compete not only on product offerings but also on their ability to be responsive to supply chain risks and reduce costs through the efficient management of the supply chain (Siagiani et al., 2018). Building resilience can also lead to the creation of new business opportunities and favorable outcomes for market development for all supply chain stakeholders (Nenonen & Storbacka, 2020).

Transition

The aim of section one was to provide information on the strategies used by companies to manage risks in the supply chain. Although the findings presented were not directly related to the oil industry supply chain, the principles posited are also applicable to the oil industry. Included in Section 1 was also a discussion on the general problem of the effects of the lack of effective supply side management on profitability and specifically the lack of risk management strategies in the oil supply chain. A discussion on the background, nature, and significance of the study was also contained in this section. Additionally, an outline of important definitions, assumptions, limitations, and delimitations was included in this section.

Section 2 encapsulates an explication of the research method and the research design. The choice of a qualitative multiple case study to explore strategies that oil industry supply chain managers use is supported and justification offered for not using the other available research methods and designs. Additionally, Section 2 provides an outline of the population and sampling description as well as data collection technique and analysis. The presentation of the findings of the study will comprise section three.

Section 2: The Project

Section 2 adds a description of my role as researcher in the data collection process as well as an outline of any relationship I may have had with the topic. A description of the process of obtaining participants for the study is included. Section 2 also includes an in-depth discussion on the research method and research design and a detailed description of the population and sampling process. The conclusion of section 2 includes how I used the data collection protocol, enhanced the validity and reliability of the data collection process, and a presentation of the data analysis.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that supply chain managers might use to manage risks in the supply chain effectively. The target population consisted of supply chain managers in oil companies in Jamaica, who manage supply chains risks effectively. The study entailed the use of semistructured interviews conducted with a sample of eight supply chain managers in four selected oil companies who have successfully implemented risk management strategies. Study implications for positive social change include the potential to improve worker living standards by augmenting employee remuneration from increased profits realized from risk reduction, and to strengthen the buying power of customers by being able to offer higher quality products at affordable prices.

Role of the Researcher

In this qualitative multiple case study, I sought to identify the strategies that Jamaican oil supply chain managers use to manage supply chain risks effectively. A

qualitative researcher has a responsibility to become conversant with the different elements of the research process. Qualitative researchers should be knowledgeable about the research methods, context, subject, and environment, to master the research complexities (De Souza Bispo, 2017). The researcher will be the instrument of data collection, interpretation, and analysis for this research. According to Graue (2015), the researcher has meaningful involvement in conducting a qualitative research study. Qualitative researchers should outline any bias or assumptions (Greenbank, 2003), which could surge from career influences as well as from any exposure to potential participants in the research. My career in the oil industry allowed for familiarity with the topic of interest as well as limited interaction with some of the potential participants. As such, I guarded against any influence on the responses garnered, by separating personal feelings and experiences when interpreting and analyzing the data. Additionally, the interview process did not include the offering of advice, to avoid leading of the participants. I facilitated a level of openness which led to the gleaning of as much information as was available. Deady (2011) posited the importance of a researcher's openness to unpredictable and un-coerced information.

I adhered to the standards and guidelines outlined in the Belmont Report. As outlined in The Belmont Report, respect for others, beneficence and justice are essential requirements for research involving people (Metcalf, 2016). An ethical approach guided all interactions with study participants.

The data collection method entailed face-to-face, semistructured interviews with senior supervisors and managers from multiple companies in the Jamaican oil industry,

conducted at locations chosen by the participants. I informed participants that I would be taking notes and audio-taping the discussions. An interview protocol guided the interview process. The interview protocol allows the researcher to garner relevant information from all participants to address the research question (Köhler, 2016).

Participants

For this study, I selected the participants using the purposive sampling method. Qualitative research encompasses the use of purposive sampling of participants who will provide the most information to address the research question (Guarte & Barrios, 2006). The eligibility criteria for participants in this study was midlevel and senior supervisors and managers in an oil company in Jamaica with sustained profitability. An important characteristic of the participants was their experience in the successful implementation of risk management strategies in the organization's supply chain.

To identify participants, a list of eligible companies was obtained from the Jamaican government agency, which has oversight of the oil industry and interacts closely with the managers working with the Jamaican oil companies. After obtaining approval from IRB, I contacted participants by email and telephone to gain access to the senior supervisors and managers of the identified oil companies. Emails and telephone calls are useful study techniques to contact potential participants for research studies (Mikene et al., 2013).

I further engaged eligible participants in discussions through telephone calls after their consent to participate, to establish a working relationship and emphasized the value which they will add to the research. Communication with selected participants and an

emphasis on the significance of their input to the study is essential to a scholarly research study (Maramwidze-Merrison, 2016).

Research Method and Design

The purpose of this qualitative multiple case study was to explore the strategies used by the supply chain managers to manage risks in the Jamaican oil supply chain. A qualitative method was the most appropriate research methodology for my research effort. I used a multiple case study design for this study to solicit answers to the study research question.

Research Method

Researchers typically use three research methods. The two traditional ways employed by researchers to study phenomena are quantitative and qualitative methods (Park & Park 2016). As of late there has been increasing focus on the use of a third approach, namely, mixed methods (Johnson, 2015). A qualitative approach was selected for the proposed study. Park and Park (2016) pointed out that qualitative is appropriate when researchers seek to understand and explore phenomena by studying things or people in their natural settings, and Mayer (2015) added the appropriateness of the qualitative method use of open-ended questions. Mayer also pointed out that unlike qualitative researchers, quantitative researchers focus on closed-ended questions with a theoretical basis and seek to explain relationships between variables through hypotheses testing. The mixed methods approach, which requires knowledge of the qualitative and quantitative methodologies, characterizes a combination of both research methods in the same study (McKim, 2017). The quantitative method and the mixed method were not

appropriate for my study, as both examine a research phenomenon, and I sought to explore the strategies used by Jamaican supply chain managers to manage risks effectively and increase profitability.

Research Design

As the main objective of the study was to explore the strategies Jamaican oil supply chain managers use to manage risk and improve profitability, I used a case study design to glean answers to the research question. Other research designs which could apply to a qualitative research exploration include phenomenological, grounded theory, narrative, and ethnographic research.

Phenomenological researchers focus on lived experiences of individuals and the view that humans shape their experiences by their self-reflections (Willis et al., 2016). The phenomenological design includes a philosophical feature which uses the intuitive experience of phenomena to gain insights into the lived experiences of individuals (VanScoy & Evenstad, 2015). The subjectivity of the phenomenological design which has an objective basis and is not dependent on the lived experiences of the participants, made it inappropriate for this study.

Grounded theory considers the use of theoretical sampling and relies on the ability of researchers for the interpretation of the collected data and applicable theories (Johnson, 2015). A grounded theory design was not applicable to this study as the objective was not to generate theories.

A narrative design focuses on an individual's view on their lived experiences and differs from the phenomenological approach in that the latter focuses on the

phenomenon. According to Safari and Thilenius (2013), the narrative design considers the narratives or insights provided by individuals about the phenomenon. The narrative design was also not suitable for my research effort, as the study sought to explore risk mitigation strategies used by supply chain managers, not to explain supply chain managers lived experiences.

Ethnographies entail the observation of participants (Ferreira et al., 2017), which makes the ethnographic design inappropriate for this proposed study. An ethnographic researcher typically spends extended periods conducting fieldwork, which encompasses extensive observations and detailed interviews (Yin, 2018).

I used a case study design for the research effort on supply chain risk management strategies. Case study research is a valuable tool which is useful in clarifying complexities and allows the researcher to make use of the experience of other individuals (Annansingh & Howell, 2016). Researchers use the case study design to investigate complex social issues from a real-life perspective by studying individuals in their natural setting (Yin, 2014). The researcher must fulfil the requirement of answering the research question in using a case study approach (Dresch et al., 2015). A case study was the preferred design for my study as the case study design specializes in gaining an in-depth knowledge and the study sought to understand strategies that successful Jamaican oil supply chain managers use to mitigate operating risk.

Population and Sampling

The purpose of this qualitative multiple case study was to explore the strategies used by supply chain managers to manage risks and increase profitability in the Jamaican

oil supply chain. I used purposive sampling to select the participants based on years of experience in supply chain operations and their role in successfully implementing risk management strategies in the oil supply chain. Researchers use purposive sampling to achieve information richness from the deliberate selection of participants within the population with the required knowledge on the topic of interest (Guarte & Barrios, 2006). Participants in a purposive sample have more knowledge about the subject matter (Tunarosa & Glynn, 2017). The aim of purposive sampling is to identify participants who best represent the population (Yuan Ling Marjorie et al., 2021). Additionally, in purposive sampling, the researcher ensures that the participants meet the requisite criteria to address the issue being studied (de Guzman et al., 2020).

I selected a sample size of eight midlevel and senior level managers from 8 oil companies in Jamaica who have been involved in the successful implementation of risk management strategies in the oil supply chain. Data were collected from the selected participants using the semistructured interview process. The determination of sample size should not be disproportionately prominent and degrade the other aspects of the data collection and analysis process (Sim et al., 2018). The research problem, the purpose of the research, and the subjects of the research are key determinants of the sample size (Blaikie, 2018). Hennink and Kaiser (2022) found that small sample sizes are effective in reaching data saturation in qualitative research.

Data saturation is the point in data collection when data becomes repetitive as no new relevant information is garnered and an adequate sample size is achieved (Hennink & Kaiser, 2022). Data saturation is also a conceptual determinant of sample sizes in

qualitative research (Guest et al., 2020). In qualitative research sampling is not required beyond the point of data saturation (Moser & Korstjens, 2018). To achieve data saturation, I used member checking as an iterative process after completing the interviews. Member checking allows the participants to verify the accuracy of my interpretation of the data (Naidu & Prose, 2018).

Ethical Research

I obtained approval from the IRB before conducting the study. The guidelines of the Belmont Report highlight respect for others, beneficence, and justice as critical elements for conducting research, which involves people (Metcalf, 2016). It is fundamental to obtain ethical approval prior to conducting research which requires the participation of people (Fleming & Zegwaard, 2018). All guidelines outlined in the Belmont Report were followed. Researchers have a professional responsibility of ensuring that an enhanced ethical strategy is utilized, as part of their duty and commitment to the participants (Rabu et al., 2022). The researcher should also seek to protect the confidentiality of the participants as part of the execution of ethical practices (Edwards, 2017).

After obtaining approval from the IRB, I contacted the participants electronically and via telephone to obtain the consent for their participation in the study. I scheduled and conducted the interviews after receiving consent from the participants. Informed consent is a necessary ethical instrument that ensures that participants are given adequate information about the details of the study and any potential impact to them, as a prerequisite to participation (Newman et al., 2021). The electronic invitations to the

participants, included an outline of the details of the study, the purpose and nature of the study, their role as participants, how the study will benefit them, as well as my contact details to facilitate the clarification of any questions they may have. Researchers have an obligation of fulfilling their duty to the participants by guaranteeing the use of inform consent and outlining the benefits of the study (Herington & Tanona, 2020). The inform consent process will help the individual to agree to participate without coercion (Chatterjee & Das, 2021). I advised the participants that participation in the study was voluntary, and they were free to withdraw from the study at any time without consequences.

I scheduled face to face interviews after receiving the signed inform consent form from the participants as an indication of their willingness to voluntarily participate in the study. The participants decided on the locations for the face to face interviews. I informed the participants that all the information collected will be stored in a secured location for 5 years, and that after 5 years, I will destroy all information collected.

Data Collection Instruments

Interviews are the primary source of data collection in qualitative research (Fornaro et al., 2021). In a qualitative study the researcher is the primary data collection instrument (Yin, 2018). As the researcher for this study, I was the primary data collection instrument. I conduct semistructured interviews face to face to gather information in response to the research question. Valuable information emerged from conducting interviews with individuals in the organization with perspectives that helped to address the research question (Hamilton & Finley, 2020). Semistructured interviews help the

participants provide adequate information about their insights on the study topic (Trang, 2022). Semistructured interviews are an effective way to address the research question (Midgley & Wilby, 2015). Interviews help the researcher to define the main themes of the study and to interpret the information shared by the participants (Moser & Korstjens, 2018).

I used a facilitative approach and allowed the participants to speak freely and employed the use of open ended questions to gather sufficient information. Researchers should focus on obtaining the participants' perceptions, insights, and experiences without influencing the responses, during an interview (Moser & Korstjens, 2018). I used an interview protocol (Appendix) for the interview process. An interview protocol is crucial to the effectiveness of the interview process as it enables the comprehensive collection of information and enhances the comprehension of the participants' perspectives on the phenomenon (Yeong et al., 2018). Interview protocols allow the researcher to glean the requisite information to answer the research question (Kohler, 2016).

I used the member checking process to ensure the validity and reliability of the information gathered during the interviews. Member checking is the process by which a researcher will seek to get feedback from the participants to ensure accurate interpretation of the data collected (Motulsky, 2021). Member checking is used to identify and correct errors and to avoid misrepresentation of the information collected (Varpio et al., 2017). The use of member checking to obtain the participants' validation is a valuable technique to guarantee the credibility of the results (Slettebø, 2021). The member checking process

revealed misinterpretations, which I identified and corrected in communication with the participants.

Data Collection Technique

I collected data through semistructured interviews to address the research question, what strategies do supply chain managers use to manage risks and increase profitability in the Jamaican oil supply chain. I obtained consent from the participants through the execution of the inform consent process prior to conducting the interviews. In qualitative research, the researcher is the main research instrument used for data collection (Moser & Korstjens, 2018). A semistructured is a facilitative process, which allows the participants to share perspectives, experiences, and indepth knowledge about the phenomenon, while the researcher learns (Orr et al., 2020). Qualitative researchers should avoid biases and assumptions while collecting data to prevent misrepresentation and inaccuracies (Clark & Vealé, 2018).

I followed a predetermined interview protocol to guide the interview process. The interview protocol entailed the provision of an overview of the study and an overview of the interview process to the participants. The target of the interview questions was to unearth adequate responses to address the research question. As such there was complete alignment between the interview questions and the research question. Interview questions should appeal to the participants' interests, have clarity, and focus towards answering the research question (Hamilton & Finley, 2020). The interview process is invaluable in that it is an interactive process that produces key data and the emergence of critical results (Fritz & Vandermause, 2018; Gibbs et al., 2007). I ensured that the participants were

comfortable by allowing them to select convenient locations for the interviews, not including their workplace. The participants shared their experiences freely without my influence nor interruption. In an interview the researcher should start with open ended questions related to the topic, which encourage the participants to be at ease and to be willing to share their experiences (Moser & Korstjens, 2018). I further informed the participants of the audio recording requirements of the interview and taking of notes to accurately capture the data. Interview recording is a useful technique for qualitative data analysis (Craig et al., 2021).

After the completion of the interviews, I conducted member checking to identify any misrepresentation of the responses obtained from the participants. I conducted member checking by sending a summary of the interview transcript to the participants, soliciting feedback on the accuracy of interpretations. Member checking is deemed a credibility and quality strategy in qualitative research (Motulsky, 2021). Motulsky (2021) posited that one approach to member checking involves the researcher providing a summary of the interview transcript to the participants in writing for review and correction. The involvement of the participants in validating the responses from the interview will also reduce researcher bias (Birt et al., 2016).

Data Organization Technique

In a qualitative study, information is gathered in the form of audio, transcripts, notes, videos, or archival documents (Yin, 2018). I compared the notes, the transcripts, and the recordings taken in relation to the study topic for consistency. I organized all data collected by date of collection and label the participant's responses using code names. I

created an electronic file for the audio recordings and use pseudonyms for each file to ensure confidentiality. I stored the electronic data on my personal computer for five years. After 5 years, I will destroy all information collected for the study.

Data Analysis

I transcribed the recorded interviews, conducted member checking, and reviewed all notes collected prior to analyzing the data collected. Data transcription is an essential step in the data analysis process. Data transcription fosters immersion into the data and enhances the representation of the perspectives of the participants (Oluwafemi et al., 2021).

For this study, I used data triangulation. I triangulated the data collected from the recorded interviews and notes taking as part of the data analysis process. In qualitative research triangulation is used as a tool to enhance the quality of the findings (Greyson, 2018). Patton (2015) identified data triangulation, investigator triangulation, theory triangulation, and methodological triangulation as four types of triangulations. Data triangulation refers to the triangulation of data from multiple sources (Yin, 2018).

The data analysis process should be of the highest quality and could include the Use of computer assisted tools (Yin, 2018). Data analysis entails the review of notes taken during data collection, and the coding of data (Renz et al., 2018). I used Nvivo software to assist with the data analysis for this study. Nvivo is a software used in qualitative study to assist with data organization and analysis (Huffman et al., 2021). The objective of using the software program was to make the data more manageable and easier to analyze (Renz et al., 2018). I coded the participants' responses into categories

based on common emergent themes related to the study topic and used the steps proposed by Doi (2021) to perform coding. I wrote down common words and phrases which related to the study topic from the interview responses. I paraphrased phrases from the interview responses and used sentences which explained the paraphrased texts. I identified emergent themes and categorized the data by the common themes. I organized the categories into sentences which provided a synopsis of the interview data, as suggested by Doi.

I continued to analyze the data until data saturation was achieved. Data saturation is achieved when the data collected adequately covers the topic of interest and further data collection will not produce any new relevant data (Fofana et al., 2020; Guest et al., 2020).

Reliability and Validity

Coleman (2021) highlighted the importance of ensuring the visibility of validity and reliability in qualitative research. Reliability and validity are markers of trustworthiness, which is an essential component of research (Rose & Johnson, 2020). In (Coleman, 2021). Reliability and validity are vital tenets to be considered when conducting research (Jordan, 2018). The inclusion of multiple sources of data, data triangulation, and the accuracy of the data collected from interviews represent integral factors in consideration of the validity of the construct in qualitative research (Quintao et al., 2020). The demonstration of the appropriateness of the methods used and the integrity of the findings is a requirement in addressing the reliability of the study (Noble & Smith, 2015).

Reliability

Reliability refers to the accurate application of the methods used and the trustworthiness of the findings (Noble & Smith, 2015). Reliability considers the consistency in the analysis of the data collected from all participants (Spiers et al., 2018; Wong & Cooper, 2016). Data triangulation is a key aspect of demonstrating reliability of the study (Qunitao et al., 2020). The illustration of clarity in the data analysis and the justification of the methods used could enhance the reliability of the study (Rose & Johnson, 2020).

Validity

Validity encompasses a determination of the accuracy of the data collected (Rose & Johnson, 2021). Validity refers to the use of the data to represent participant experiences accurately and appropriately (Spiers et al., 2018). Long and Johnson (2000) named content validity, criterion-related validity, and construct validity as three aspects of validity. Content validity refers to the extent to which the instrument captures aspects of the phenomenon being studied (Kennedyet al., 2019). Criterion-related validity refers to the alignment between the data instrument and the findings, and construct validity is concerned with the proximity of the instrument and the phenomenon (Long & Johnson, 2000). The implementation of member-checking is one way of ensuring validity (Coleman, 2021).

Transition and Summary

Section 2 of the study encompassed an explication of the purpose of the study, role of the researcher, and participants. I further explained the research method and

research design used for the study and how the data was collected and analyzed. I ended the section with a discussion on the importance of ensuring the reliability and validity of the study. Section 3 presents the findings of the study and details how the study applies to professional practice, and study implications for social change.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative multiple case study was to explore the strategies that supply chain managers use to manage risks in the Jamaican oil supply chain. The population included eight supply chain managers from four companies in the Jamaican oil industry. I used purposive sampling to select the participants at the mid and senior leadership levels, who were all responsible for making decisions in their organization's supply chain. All eight managers had experience in the successful implementation of risk management strategies in the supply chain. The data collected came from semistructured interviews which were conducted face to face with each participant. Notes taking and audio recordings were features of the interviews with all participants. I used the member checking process to ensure the accuracy of the data collected.

I analyzed the interview data using Nvivo 14 coding software. The three primary themes which emerged from the data analysis were (a) adaptability and flexibility to oil price volatility, (b) partnership and collaboration, and (c) product quality assurance. The primary themes were further categorized into sub-themes as part of the analysis.

Presentation of the Findings

The purpose of this qualitative multiple case study was to answer the research question, "What strategies do supply chain managers use to manage risks in the Jamaican oil supply chain effectively?" I conducted semistructured interviews with open ended questions with eight midlevel and senior level managers from the Jamaican oil industry. All managers interviewed have experience in the successful management of supply chain

risks in the oil supply chain. I took notes and audio recordings of the interviews. After transcribing the data collected to a transcript, I conducted member checking until I reached data saturation. After reaching data saturation I used Nvivo 14 software to identify the primary themes and analyze the collected data. This section includes a detailed presentation of the three primary themes and subthemes, which emerged from the data analysis.

Theme 1: Adaptability and Flexibility to Oil Price Volatility

Effective risk mitigation strategies is dependent on an understanding of the root causes and the resultant impact of those risks if left unmanaged (Kahkonen et al., 2023). A company's ability to respond appropriately to oil price volatility is one way of managing risks in the oil supply chain based on responses from seven managers. Agility and adaptability are important characteristics of resilience and competitive advantage (Aslam et al., 2020). The seven managers explained that flexibility and adaptability is a crucial response to the prevailing price volatility which pervades the oil industry. Jamaica is directly affected by fluctuations in international oil prices as Jamaica is not an oil producing country and all oil companies have to import petroleum products. Five managers mentioned that oil is an essential product as an input in most manufacturing processes. As such, when the price of oil increases, inflation and the prices of goods and services increase consequently. It is therefore critical for oil companies to adopt a pricing strategy which is flexible enough to manage the price changes and diminish the negative impact on the organization's profitability and the country's economy.

Five of the eight managers focused on procurement strategy as a risk management response to price volatility. The five managers explained that if the company has sufficient storage capacity and follow market trends, the leaders can make purchases when the price is propitious and hold the inventory if the price changes to a less favorable level after purchases.

As another strategy to manage the risks of price volatility, managers M02, M03, M04, M06 and M07, mentioned risk hedging as a necessary risk management tool. According to the managers, it is not always possible to pass on product cost changes to customers and so risk hedging is one of the methods used to minimize price volatility risk. The managers indicated that some organizations avoid the practice of risk hedging because of potential losses associated with the strategy, but in their experience the benefits far outweigh the potential losses. They stated that they have successfully utilized risk hedging as a mitigation tool against losses resulting from price volatility and preserved the organization's margins.

Table 1 shows the summary of the managers' responses related to adaptability and flexibility to oil price volatility.

Table 1

Number of Respondents and References Made to Theme 1 Adaptability and Flexibility to Oil Price Volatility

Subthemes	Number of respondents	Number of references
Pricing strategy	7	17
Procurement strategy	5	9
Risk hedging strategy	5	5
Risk management tools	4	7

Note. Data from NVIVO software show four subthemes which emerged from the data analysis, related to the primary theme Adaptability and Flexibility to Oil Price Volatility. The number of respondents indicate the number of participants who mentioned each theme, while the number of references show the number of times the participants referred to the subtheme.

Subtheme 1: Pricing Strategy

Historically, oil has been a core component of the energy industry and as a result, oil prices have been affected by governmental decisions and economic cycles (Kara & Gok, 2022). Seven managers agreed that speculation and geopolitical issues around the world influence the movement of oil prices. The Jamaican oil companies are directly impacted as the organizations source oil through importation. The managers stated that they have to develop pricing strategies as a response mechanism to lessen the effect of price fluctuations. Managers M02, M03, M04, M06, and M07 posited that from a pricing perspective, they had to negotiate pricing formulas which helped them to adjust the selling prices for their product when there is significant volatility in the buying prices. The five managers mentioned that one pricing strategy which they used is the index based pricing strategy. M02 defined index based pricing as a pricing formula which uses a price

that is indexed to a type of system which allows the organization to incorporate a price plus a margin in determining the selling price for the products. The managers stated that with the index based pricing approach, the organization obtained a fixed price which allowed for price adjustments as were apposite to cover potential losses. Manager M02, M03, M04, and M06 mentioned that in the petroleum business, the marketplace has reference prices, which move with the ebbs and flows of the marketplace and as such they typically focus on supply sources which offer reference indexes which are more aligned to the organization's business strategy. A pricing strategy which entails the purchase and sale of products using an index plus margin is vital to Jamaican oil supply managers.

Manager M05, M06, and M08 stated that they modified their procurement practices to manage price volatility. The managers established partnerships with other oil companies in the region to purchase petroleum products in bulk. With the intercompany partnerships, the managers utilized the opportunities to combine purchases with organizations from other islands which are shipping to multiple locations. One benefit of the partnerships is that all the participating organizations enjoy cheaper purchase prices through volume discounts, which allow them to offer competitive prices for their products.

All seven managers agreed that the potential repercussions of price volatility are extensive as the organization can experience margins contraction and decline in profitability.

Subtheme 2: Procurement Strategy

The purchasing function constitutes the selection of suppliers, management of contracts, assessing supplier performance, and establishing long-term relationships with suppliers (Bayo-Moriones et al., 2011). Five managers explained that they implemented risk management strategies which entailed purchasing decisions geared towards increasing or decreasing oil product inventory to take advantage cost reduction opportunities. Companies maintain inventory to reduce shipping and ordering costs, take advantage of volume discounts, ensure continuity of sales, and avoid fluctuations in demand (Day et al., 2019). The managers stated that price volatility can be managed with sufficient storage capacity for petroleum products. According to the managers, adequate storage capacity will give the organization leverage to make bulk purchases when prices are suitable and stock inventory when prices are trending downwards.

M04 postulated that there are several factors which supply chain managers have to consider when moving petroleum products from source to the marketplace. One such consideration is that the organization usually cannot spot order, so the leaders have to plan in advance based on projected sales, and purchase with the expectation that purchases are sufficient to meet demand until the next purchase cycle. Manager M05 agreed that the organization's ability to accurately forecast demand is a critical element in the procurement decisions. The manager stated that the organization cannot make purchases on a just in time basis, and so demand forecast has to align with purchasing cycles for the large quantities of petroleum products the company has to purchase.

The five managers agreed that bulk purchasing is an effective response to price volatility, Managers M03, M04, and M06 stated that bulk purchasing is limited to available storage capacity for stocking inventory. In response to the potential challenge of insufficient capacity, the managers typically leverage available storage through partnership with other oil companies. Additional storage is the means of ensuring that the supply of products remains consistent even if the main sources of supply are unavailable and if prices are a deterrent during that purchase cycle.

Sourcing is also a critical aspect of the organization's procurement strategy. The successful performance of a supply chain is contingent on the selection of the right suppliers (Namdar et al., 2018). The managers explained that sourcing is especially crucial because of limitations to the existence of supply sources in the Caribbean region. Companies therefore have to seek suppliers from other regions and be subject to heavy taxation, which further increases the prices of products. The managers stated that to combat the risk of sourcing the companies partner with each other to find the right sources, located close enough to the region, where reliability and quality would not be compromised, and the contractual terms are favorable to all. As a contingent, companies rely on the government refinery to source and provide supplies to industry.

Climatic conditions also influence the organization's procurement decisions and response to price volatility. The five managers outlined that Jamaica is located in the Caribbean region and is susceptible to hurricanes and natural disasters. Managers M02, M04, and M07 stated that customarily, the leaders adjust their purchasing patterns in anticipation of the fixed hurricane season. As a result, these organizations have not

experienced any major disruptions due to natural disasters and are able to continue operations without dislocation. Cao and Ma (2022) stated that supply chains often inevitably suffer from the risk of excess inventory, inventory tradeoffs and other factors such as natural disasters which cause supply disruptions. Therefore, it is incumbent on supply chain managers to measure and effectively manage the consequent risks.

Subtheme 3: Risk Hedging Strategy

Myamba and Nguni (2023) defined risk hedging as a plan determined by the top management of the company to combine and allocate resources in the supply chain to counter the adverse effects of supply interruptions. One of the main strategies manager M01 explained was risk hedging as a mitigation tool against price volatility. Manager M02 defined risk hedging in the context of the oil supply chain as the process by which organizations take actions to mitigate the risk of price volatility on margins. Manager M03 defined risk hedging as an initiative or technique which organizations implement to reduce potential losses associated with price fluctuations.

Five managers presented risk hedging as a risk management response to price volatility. The managers explicated that after oil products are sourced and purchased, prices can fluctuate and change the value of the product on hand. Consequently, the company could experience selling products at a loss due to price changes if there is no mitigating action. Risk hedging is therefore necessary and encouraged considering the company has storage capacity and possesses the ability to withstand the shocks of market changes. Manager M02 stated that in Jamaica, currency devaluation is a contributory factor for risk hedging. Manager M03 agreed that the strain on Jamaican currency has an

impact on the oil companies as imported oil products are paid for in foreign currency. As the Jamaican dollar devalues, the landed costs of the oil products increase, triggering the need to use risk hedging as a strategy to protect margins. Manager M08 mentioned that since oil prices are highly determined by geopolitical and economic conditions outside of the sphere of the oil companies, risk hedging is the primary mitigation strategy to manage price volatility. It is crucial that organizations mitigate the risk of price fluctuations through hedging as hedging not only protects against the risks of increasing prices but also improves the company's capital utilization (Xu et al., 2023).

Theme 2: Partnership and Collaboration

The development of cooperative relationships between companies can enhance value creation and plays a pivotal role in almost all business areas especially in relation to supply chain management and logistics (Lindsey Hall et al., 2022). Goldsby et al. (2019) outlined that, to survive and succeed in competitive markets, companies must collaborate with other companies to leverage opportunities and share risks. Six managers agreed that a collaborative effort is necessary for the management of risks in the supply chain, as risks affect all oil companies in the industry collectively. The managers explained that establishing relationships with suppliers and other oil companies in the industry will provide mutually beneficial gains to all participants and assist with securing the profitability of the companies.

The managers highlighted the importance of communication in developing solid relationships which improve the operations of the supply chain and the management of supply chain risks. The managers further added that collaboration and communication in

supply chains can strengthen the process of supply chain risk management. According to Managers M02, M04, and M06, communication among all stakeholders in the supply chain remains paramount to ensure that there is alignment in every area of the supply chain operations. Yang (2013) found that the success of an organization depends on maintaining long term, secure relationships, which promote efficient communication, improved information sharing, and trust.

Five managers posited that intercompany partnerships and collaboration were essential to the development of a unified approach to risk management. Relationships and collaboration in the supply chain can enhance the organization's supply chain resilience, knowledge, and resource exchange, and thereby eliminate supply chain risks (Cab Saglam et al., 2011). According to the managers, the establishment of intercompany collaboration assists with the management of off-shore risks through sourcing, quality, logistics, and getting petroleum products to Jamaica securely and timely.

The managers also highlighted relationships with government authorities as another effective risk management tool. According to Dubey et al. (2023), the disruption to supply chains in some parts of the world has been made worse by a lack of government support. The managers found that the relationships with government regulators and authorities ensure that all companies follow the procedures and carry out the necessary quality checks to mitigate against some of the supply chain risks.

Table 2 provides an illustration of the managers' responses related to partnership and collaboration.

Table 2

Number of Respondents and References Made to Theme 2 Partnership and Collaboration

Subthemes	Number of respondents	Number of references
Communication	6	11
Intercompany collaboration	5	22
Government relations	5	14
Collaboration with suppliers	4	7
Berth availability and use	4	6

Note. Data from NVIVO software show five subthemes which emerged from the data analysis, related to the primary theme Partnership and Collaboration. The number of respondents indicate the number of participants who mentioned each theme, while the number of references show the number of times the participants referred to the subtheme.

Subtheme 1: Communication

Communication is an interpersonal process that involves the beginning, maintaining, and ending of information exchanges (Park et al., 2012). Communication represents one of the subthemes which emerged from data analysis. Six managers agreed that effective communication builds trust within the supply chain and enhances the outcomes of supply chain activities. The sharing of accurate information about the supply chain at the appropriate time may help supply chain at the appropriate time may help supply chain stakeholders to better understand business operations and decisions (Can Saglam et al., 2022). According to the managers, communication among stakeholders enables complete understanding of the requirements and procedures involved in getting product from the supplier to the final customer. Managers M01 and M02 highlighted the importance of constant communication with the berthing authorities at the receiving port

to prevent delays in the docking of shipping vessels. The managers stated that in Jamaica, cruise ships have priority status for the use of the multipurpose berth. It is therefore incumbent on the oil company's leaders to maintain communication with the berth representatives to acquire knowledge about the availability of the berth for use, to prevent delays and demurrage costs.

Four managers focused on the importance of communication with suppliers to negotiate prices and to confirm product quality requirements. Manager M04 mentioned that from a pricing perspective, there are ongoing discussions and negotiations with suppliers to determine a pricing formula which will assist the company's leaders in making pricing decisions when there is significant volatility in prices. The managers explained that discussions on product quality with suppliers is of paramount importance. According to manager M05, suppliers in the supply chain adhere to quality standards which may differ from the standards of the buying company, and the government requirements. Since the quality standards of the company are typically more robust, the supply chain managers engage with the suppliers to make sure that there is compliance with all the quality requirements, which make the imported products fit for sale. Kedzia and Staniec (2022) found that companies should maintain proper communication with suppliers to increase supply chain resilience and improve company performance.

Subtheme 2: Intercompany Partnerships and Collaboration

Intercompany collaboration entails the creation of partnerships among companies to manage value added processes through planning, training, and resource integration (Fawcett et al., 2008; Adams et al., 2014). Manager M02 stated that collaboration among

petroleum companies is critical to the effective management of the supply chain. Five managers mentioned that there is currently an association of petroleum leaders from different companies, working with the government to establish industry standards to address risks prevailing in the supply chain. Lindsey Hall et al. (2022) found that interfirm collaboration may lead to the creation of value for the partners and help the companies gain strategic benefits for supply chain management. Partnership, collaboration, and integration in the supply chain facilitate connections that foster knowledge sharing and resource sharing among organizations, to improve performance (Mofokeng & Chinomona, 2019). According to the managers, they engaged in intercompany relationships and collaboration to reduce supply cycle, increase storage capacity, and capitalize on the opportunities to purchase products in bulk. This strategy augmented the reliability of supplies and increased the companies ‘resilience to stave off the risks of price volatility.

Manager M03 explained that the availability of suppliers of petroleum products in the Caribbean is minimal. Therefore, companies within the Caribbean have to source supplies outside of the region, subject to additional taxes and external tariffs. As a response mechanism, the companies establish alignments and partnerships with each other to make bulk purchases together to benefit from volume discounts and shared freight and logistics costs. Additionally, the risks encountered are shared by all participating companies, which lessens the burden borne by any one company. Manager M05 shared that storage capacity limitations influence the quantities that the company can purchase to meet demand. Through a long-term partnership with another oil

company, they are able to secure additional storage capacity, which increases the company's ability to purchase sufficient inventory, in exchange for mutually beneficial gains. Successful collaboration can generate mutually beneficial value for all the partner organizations (Shin et al., 2019).

The managers also stated significant collaboration exists among oil companies to address product testing requirements and potential quality defects. The risk of compromised product quality is inherent as companies with different quality standards are making product purchases together, comingling the products which are purchased. Managers M05 and M07 shared that there are dissimilarities among companies in terms of quality standards. However, the companies establish agreements to adhere to the highest standards when comingling, as long as the standards are in compliance with market regulations. The collaborative partnerships in supply chains emerge from the coordination among networking companies to improve performance (Nha Trang et al., 2022).

Subtheme 3: Government Relations

Regulatory frameworks, which are the result of collaboration between regulators, service providers, and consumers have a significant impact on the marketing environment (Quach et al., 2020). Five managers discussed the importance of collaboration between the oil companies and the regulators to ensure that suppliers and other supply chain stakeholders comply with local regulations which protect the organizations and consumers. The upkeep of quality standards and the enhancement of customer service performance fall under the purview of policy makers (Quach et al., 2020).

Three managers referred to a product quality incident called the ‘bad gas’ event which confronted the Jamaican oil industry in recent years. The managers expressed that the ‘bad gas’ incident caused significant adverse effects to the oil companies and the Jamaican economy. In response to the incident, the company leaders and policy makers collaborated and agreed on the development and implementation of new regulations to prevent potential product quality issues. Manager M05 explained that subsequent to the ‘bad gas’ event, the government implemented more stringent product testing requirements for imported petroleum products. In addition to the quality tests carried out by importers, the government representatives from the Bureau of Standards collect product samples, which are tested and approved by the Bureau. Products get released for sale to the public, subject to the results of the quality tests. Manager M07 asserted that the government implemented regulations which are effective in safeguarding the product quality from ship to shore. Mishaps in hazardous industries result in the focus on regulatory shortcomings and draw attention to governmental oversight (King & Hayes, 2018). Government regulation is an important element in marketplaces where there are numerous dominating forms which can affect cost, availability, and quality of the product.

Managers M01 and M03 stated that government bureaucracy can cause delays in the performance of product quality tests on imported products. The managers further shared that partnerships with the relevant government agencies are necessary to expedite approval processes and overcome the potential impediments to getting the products ready for sale. According to manager M01, the relationship with local authorities ensures that

procedures are followed and there is adherence to the relevant quality checks to mitigate product quality risks. The manager stressed that collaboration with the government assists the company in achieving its objectives. The relationship between the government and company constitutes an important component in the development of the company (Miao et al., 2022). The managers agreed that the government has a key role in the development of risk mitigation strategies in some areas of the supply chain. It is incumbent on the government to institute regulatory measures, systems, and controls to make companies accountable for their actions. It is equally important for companies to maintain strong relationships with the government to help them to understand the risks that exist and their role in the management of those risks. Political connections are part of a larger pool of connections which companies could use to mitigate various external risks and uncertainties (Farag & Dickinson, 2020).

The managers highlighted the role of the government in maintaining a safety focus in the oil industry. Manager M05 articulated that safety and environmental risks are inherent in the supply chain and must be managed to prevent incidents which are detrimental to lives and properties. The regulators have partnered with the oil companies to manage the safety and environmental risks through the process of inspections and supervision provided by the port authority and other supporting government agencies. Safety management is essential to the government to promote social stability and economic growth (Farag & Dickinson, 2020). Manager M01 stated that a major safety incident can cause a shutdown of the company's operations and remarkable negative impact on the economy. The manager mentioned that the organizational leaders

implement safety measures to manage safety risks, supported by industry regulations, when receiving imported petroleum products at the port. Manager M08 specified that it is necessary to mitigate environmental risks as the exposure can be limitless. As an example, an oil spill during the product discharge process could cause soil and water contamination and lead to a shutdown of the port to enable recovery and cleanup activities. The regulatory standards to prevent environmental mishaps are stringent and attribute costly penalties for violations to violating companies. The regulators also ensure that there is governmental presence during the unloading of an oil vessel, to provide supervision and immediate response in the event of an emergency. Government regulation embodies a crucial tool for the reduction of pollution in the marine environment as the marine ecological environment is considered a public good (Yu et al., 2023).

Theme 3: Quality Assurance

Supply chain quality is essential to achieving competitive advantage (Xie et al., 2011). Quality assurance ensures the products functionality and conformance to the end users' expectations (Wijewickrama et al., 2022). Quality assurance procedures characterize the collection of companywide activities, which promote collaboration and teamwork in the process of continuous product and service improvement (Bayo-Moriones et al., 2011). Seven managers explained that it is incumbent on the stakeholders along the supply chain to ensure that products sourced meet the requisite quality standards to prevent quality related risks. Quality is a core feature of any product. Premium materials,

outstanding performance, and reliability are desirable features of good quality (Jiang et al., 2022).

According to the managers, employees training is a critical determinant of quality assurance. Manager M02 asserted that the roles and activities within the supply chain require specialized skillsets. Supply chain managers must incorporate continuous training in their portfolio, to equip the employees with the specialized skill and knowledge, which enable quality execution at the different segments within the supply chain. Finding the right people for the right jobs is difficult, as in the supply chain it takes unique skill requirements to connect the different functions within the organization and the supply chain to foster value creation (Flothmann et al., 2018a). Manager M03 believed that capabilities, competencies, and training programs are germane to the supply chain and its operations.

Six managers highlighted product quality as a significant element of quality assurance. Manager M05 pointed out supply chain managers ensure that product quality adheres to the company's quality standards and government regulations as poor product quality can adversely affect equipment, production, and customer satisfaction. In some industries, competition is shifting from price to quality as customers are demanding higher product quality. Therefore, more organizations are using quality improvement as an effective competitive tool by focusing on supplier quality control (He et al., 2016). Product quality deficiencies can lead to liabilities from potential safety risks. A focus on quality could reduce the occurrence of safety issues, and increase consumers' utility and demand (Fan et al., 2020).

Table 3 shows the summary of the strategies expressed by the managers in relation to quality assurance.

Table 3

Number of Respondents and References Made to Theme 3 Quality Assurance

Subthemes	Number of respondents	Number of references
Training	7	13
Product quality	6	15
Customer satisfaction	5	6
Equipment inspection	5	10
Investments	5	14
Safety	4	6
Time management	1	1

Note. Data from NVIVO software show seven subthemes which emerged from the data analysis, related to the primary theme Partnership and Collaboration. The number of respondents indicate the number of participants who mentioned each theme, while the number of references show the number of times the participants referred to the subtheme.

Subtheme 1: Training

In the supply chain, knowledge, skills, and abilities are unique and enhance the company's competitive advantage (Birou & Hoek, 2022). Companies and employees in the global marketplace require specialized training to boost their competitiveness. Training is a procedure which uses various approaches to improve the knowledge and skills employees need to do their jobs effectively (Hashim & Shariff, 2016). Seven managers emphasized that employees training is necessary to avoid some supply chain risks and to enhance the management of other risks. The managers agreed that most of

the supply chain activities require specialized training to ensure safety, efficiency, and reliability. Manager M04 articulated that the company has skilled employees in place who have complete understanding of the supply chain operations and the management systems and controls which are necessary to manage the operations. The ongoing development of human capital revenue in an organization is necessary for the managers to enrich the pool of knowledge, skills, and talents (Wright et al., 1994). An employee's knowledge, skills, abilities, and values could be augmented through training, education, and other professional initiatives which will increase the performance of the workforce and the company (Hashim & Sariff, 2016).

The managers highlighted that training is done consistently for all the workers who are actively involved in the supply chain operations. The supply chain managers ensure that the workers responsible for operating equipment, managing data, analyzing product specifications, and assessing product quality, possess the knowledge, skillsets, and information to execute their duties safely and effectively. All managers agreed that training administration is sometimes impacted by accessibility to training as specialized trainings for supply chain operations are not available locally. Collaboration among the oil companies becomes essential in fulfilling training needs. As an example, the companies provide labor support to each other whenever employees have to travel internationally to participate in the relevant training sessions. Intercompany collaboration in the supply chain can increase a company's knowledge and competencies, and foster supply chain resilience (Can Saglam et al., 2022). The companies also partner with local

governmental agencies to develop training programs, which can be administered locally, especially in the area of safety based on the volatile nature of petroleum products.

Manager M05 highlighted the importance of training as a requirement for quality assurance by stating that without appropriate training, lack of adherence to standards could create challenges which affect product quality and customer satisfaction. Managers M06 and M08 also stated that their companies have their own testing laboratories with technicians who are trained extensively in all testing processes, including mandatory internal training program, overseas training with equipment manufacturers, and onsite training facilitated by international equipment suppliers. The managers reiterated that continuous training is necessary to mitigate safety and quality risks in the supply chain.

Subtheme 2: Product Quality

Tse and Tan (2011) defined product quality risk as inherent quality issues with production inputs, logistics, and other areas of the supply chain which could have a cascading effect on the entire supply chain. Six managers explained that they have to ensure that imported petroleum products meet local quality standards to prevent product quality risks. Manager M01 asserted that the supply managers in his organization make sure that the relevant product tests are carried out to guarantee compliance with quality standards before introducing the products to the market for final sale to customers. The managers mentioned that quality remains a significant area of focus in the Jamaican oil industry especially in light of an incident in recent years, which involved product quality issues that significantly affected the market and supplies. In giving a synopsis of the incident, the managers stated that petroleum products were imported that did not meet the

quality requirements but were sold to the public. The impact of the occurrence extended to damage to customers vehicles and equipment after purchasing the low-quality products. The product quality incident led the government to implement new regulations to identify and resolve product quality risks and protect the oil industry and the consumers. The managers agreed that although the new regulatory requirements created additional steps in the product quality assurance process, which could potentially delay products getting to the market quickly, the initiative was welcomed as the benefits far outweigh the potential costs.

According to Manager M03, his company hired quality assurance agents to get expedited approvals for imports after all testing requirements are met. Manager M05 also stated that when a vessel arrives with imported products, the company, through the petroleum terminals, collect samples from the vessel and conduct a series of standard tests before transferring the products into storage tanks. Further, the government has added another layer of contingency to have the government agencies collect and test additional samples before the products can be released for sale to the public. Recognizing the importance of quality, governments create legislation and designate regulatory agencies to mandate and enforce quality standards in some instances (Arya et al., 2014). Quality is an important component in the production and delivery of goods which are defect-free and satisfy customers requirements within the supply chain (Sila et al., 2006).

Managers M03, M05, M06, M07, and M08 asserted that their companies adhere to the government of Jamaica Petroleum Quality Control Act, with specifications similar to international standards. They further stated that all petroleum products distributed by

their respective companies adhere to stringent industry standards. Managers M06 and M08 posited that in addition to training and adherence to national and international standards, their company utilizes a labor quality management system which includes a calibration, verification, and maintenance program for product testing instruments. The company uses these systems to ensure that they supply only products which meet the required quality standards.

The managers explained that when moving products from supplier to customers, the supply chain managers maintain a focus on safe delivery and ensure that quality standards are not compromised. Five managers added that poor quality products can affect equipment, production, and customer satisfaction. The managers further mentioned that although in most cases companies partner with each other for the importation of petroleum products, each individual company is responsible for its own product quality and meeting the testing requirements. Companies also engage in the injection of product additives to imported products as a differentiator, to achieve competitive advantage through product quality.

Applications to Professional Practice

In this qualitative multiple case study, I explored the strategies supply chain managers in the Jamaican oil industry use to manage supply chain risks effectively. The population included eight supply chain managers from four oil companies located in Jamaica who successfully implemented strategies to manage supply chain risks. I recruited supply chain managers as they are the most appropriate population with experience in deploying successful risk management strategies in the oil supply chain. I

purposely selected the population from oil companies located in Jamaica as these oil companies experience ubiquitous supply chain risks with the potential to erode profitability and lack of risk management strategies is a prevailing concern in the industry. The findings of this study may assist supply chain leaders within oil companies with innovative solutions which will enhance the management of risks and improve profitability. Risk management teams who seek to mitigate supply chain risks may be able to use the findings of this study to develop and implement more effective strategies to mitigate supply chain risks and increase profitability.

The increasing complexities of supply chains make effective management of supply chain disruptions a priority for supply chain leaders (Baryannis et al., 2019). As organizations focus on identifying and mitigating the supply chain risks which could affect profitability adversely, it is imperative that supply chain leaders are equipped with the requisite risk management capabilities which build resilience and enhance performance. Supply chain risk management capabilities have positive effects on the company's profitability and performance and enhance competitive advantage through effective risk management (Qiao & Zhao, 2023). Under the conditions of supply shortages and increases in demand brough about by supply chain disruptions, organizations need to develop the capabilities to be alert to, adapt to, and respond to changes with efficiency and effectiveness (Liu & Wei, 2022). The study participants emphasized that supply chain leaders should develop strategies which are flexible and adaptable to supply chain changes, particularly strategies related to pricing and procurement. These findings may increase supply chain managers' knowledge and

understanding of strategies used to navigate the prevalence of price volatility, which is an inherent feature of the oil supply chain. Additionally, the managers may be better positioned to select suppliers who present with the requisite characteristics which facilitate the continuity of supply at prices and enable increased profitability and improved performance. As companies operate in a dynamic environment of proliferating changes, the focus is on the development of strategies which ensure the companies' viability (Ho et al., 2015).

This study provides some relevant findings to supply chain managers for developing strategic partnerships to enhance their risk management strategies and competitiveness. Organizations seek to gain supply chain risk capabilities through well aligned collaboration. This study posits relevant insights on the importance of collaboration for supply chain managers. First, it is recommended that the stakeholders establish effective communication which fosters the building of trust and the sharing of information geared towards a unified approach in the management of supply chain risks. Collaborative risk management is a process built on shared commitment between companies with the aim of reducing supply chain risks through resource sharing and the development of mutually beneficial capabilities (Friday et al., 2018). Interorganizational relationships are fundamental in the management of supply chain disruptions (Bygballe et al., 2023). Second, managers should establish strategic relationships with policymakers to ensure that there are regulations in place to protect organizations and customers and to make companies accountable for their actions. The relationship between companies and the government can enhance a company's development (Miao et al., 2022).

Supply chain managers in the oil industry should pay increasing attention to the cultivation of a quality assurance process as a supply chain risk management capability to respond to product quality risks and improve customer satisfaction. The findings of this study indicate that prioritizing specialized training and product quality may guarantee the assurance of quality in company deliverables and mitigate quality related risks. Quality in the supply chain is a key factor in attaining customer satisfaction (Sila et al., 2006).

The findings of this study create an understanding that key supply chain capabilities are a prerequisite for companies to realign their strategies and resources to adapt to a changing environment. As this study was undertaken in a developing country, one where companies are vulnerable, a study suggestion is that supply chain managers adopt the right combination of strategies to manage supply chain risks.

Implications for Social Change

Globalization and the growing complexities and interdependences within the supply chain increase the vulnerability and potential consequences of supply chains (Ozdemir et al., 2022). It is essential for an organization to implement the appropriate measures to manage vulnerabilities and meet the needs of the stakeholders. Therefore, supply chain risk management is not solely a mitigation tool for supply chain risks but also a strategic management process which leaders use to generate value for the company, its customers, shareholders, and other stakeholders (Trkman et al., 2016). Therefore, it is imperative that supply chain managers implement strategies which address operational and financial risks as well as focus on the social requirements of the

community. Supply chain social aspect encapsulate operational activities which impact people and the community (Klassen & Vereecke, 2012).

The impact of supply chain risks is drastic on the social wellbeing of many stakeholders and the findings of this study highlight the importance to allocate much attention to the implementation of effective risk management strategies. Supply chain managers should consider the important role of social implications in their operations (Najaf et al., 2023). In terms of social implications, supply chain managers can use the findings of this study when developing risk management strategies to improve workers and customers experience and promote economic growth. Companies can motivate workers by providing them with resources and autonomy and creating opportunities for the workers to use their knowledge to make decisions and solve operational issues. Empowering workers will work as a catalyst to the creation of a risk management culture which would help to build resilience in the supply chain and enhance employees development. Supply chain leaders should use knowledge garnered through collaboration and information sharing to help employees hone their skills and knowledge base and boost their development (Ali & Arslan, 2023). Additionally, managers should develop training and rewards program to influence behaviors in employees which spur positive operational changes (Ali & Arslan, 2023) and improve workers welfare.

Supply chain managers should ensure that social needs are addressed by implementing preemptive measures which lessen the social risk effects of supply chains. Companies can demonstrate their social responsibility by engaging in social sustainability. Social sustainability activities can cause an organization to gain

competitive advantage and win customer trust (Duong & Ha. 2021). If supply chain managers actively promote social sustainability incentives which emphasize enhancing employees' working conditions, wellbeing, health, and safety, they will further achieve the company's objectives and establish a positive reputation. In a dynamic environment, collaboration is essential to the success of companies in the supply chain. Companies that collaborate can identify and resolve social issues quickly and effectively and contribute to society by reducing pollution and protecting the environment (Duong & Ha, 2021). Customers would be willing to support companies which are socially responsible. In addition, employees' satisfaction is more likely to increase because of positive impressions of workplace safety.

In addition, this study can assist the government of third world countries and particularly Jamaica, to effect social change and enhance the economy. Since the cost of energy is high and oil is an input in all manufacturing processes, the government should seek to implement policies that address the high energy cost. The reduction in energy cost will reduce production costs and the cost of goods and services, and result in reduced inflation levels and the promotion of economic growth.

The use of effective risk management strategies may lead to the development of a more robust risk management process in the supply chain context which can create a more efficient and effective supply chain. Effective supply chains can increase a supplier's ability to meet customer needs, improve product quality and cost and enhance product development (Ozdemir et al., 2022). Organizations that are a part of an efficient

supply chain can increase profitability, which would increase job creation and employee welfare, promote economic growth, and improve social conditions.

The findings of this study can help supply chain managers in the oil industry to solve social issues in a responsive manner. Supply chain managers can enrich employees' wellbeing and working conditions and increase their companies' value to the community.

Recommendations for Action

The purpose of this qualitative multiple case study was to explore the strategies that supply chain managers use to effectively manage risks in the Jamaican oil supply chain. To improve the attainment of the planned goals, it is essential for an organization to have the capacity to control risks variable which could jeopardize performance (de Souza Feitosa et al., 2021). The results of my study may assist oil supply chain managers to develop and implement effective strategies to successfully manage risks in the supply chain and improve profitability. Based on the findings of this study, I would posit the following recommendations.

First, as the findings suggest, the oil industry is subject to price volatility which requires systematic management to mitigate potential losses. I would recommend that supply chain managers develop pricing and procurement strategies which allow them the flexibility to respond to price changes quickly and appropriately. The company's purchasing decisions should include establishing partnerships with other stakeholders to make bulk purchases, thereby reducing the impact of increases in product prices. Supply chain managers should also ensure that they remain current with market conditions to enable accurate forecasting in making purchase decisions.

I would also recommend a risk management approach which incorporates partnerships and collaboration among supply chain stakeholders which is mutually beneficial for all supply chain partners. Communication, knowledge sharing, and trust are essential pillars for successful communication. The benefits of collaboration are multifold and encompass the leveraging of opportunities and the sharing of risks. Partnerships with suppliers, other companies and policymakers will lead to value creation and improved profitability for all partners. A collective approach to risk management can improve performance in all areas of the supply chain.

Another recommendation includes a focus on quality in all aspects of the supply chain. The findings of this study indicate that quality assurance is an important element of risk management in the oil industry based on the volatile nature of petroleum products. I recommend that Jamaican oil supply chain managers invest in employees training to develop the skillsets necessary for quality assurance. Specialized training programs will improve employee development, the quality of workers output and continuous improvements in the quality of products. Additionally, managers and regulators should ensure the development of robust product standards and adherence to such standards through the implementation of policies and procedures which comply with regulations. Adherence to standards and procedures is essential to the distribution of quality products in the marketplace. Governments and regulators have a responsibility to establish a well structured regulatory framework which compels companies to adhere to social requirements in the supply chain (Najaf et al., 2023). Government should also seek to

develop policies that support the reduction of energy cost and boost the oil industry and economic growth.

The findings and recommendations of this study are useful to supply chain managers, organizational leaders, policymakers, and researchers. Supply chain managers and organizational leaders in the oil industry can use the study findings to develop effective risk management strategies which will benefit individual organizations and the supply chain as a whole. Policymakers can use the findings to strengthen regulations geared toward ensuring companies compliance with social policies and researchers can use the findings to explore other risk management strategies not covered in this study.

Recommendations for Further Research

In this qualitative multiple case study, I explored the strategies supply chain leaders use to manage risks in the oil supply chain. As there are limitations in the research process for this study, it is hoped that further researchers can make improvements which will make future research more comprehensive. The study was specific to supply chain managers in the oil industry located in Jamaica. Future research directions could aim to deepen our understanding of supply chain risks and risk management strategies used in other industries and other geographic regions as supply chain risks transcend across borders and pervade many industries.

This study was also limited in that the focus was on a segment of the supply chain downstream operations. A case study could also be conducted on the offshore oil supply chain to distinguish the supply chain risk management strategies which are adopted by companies which operate in the upstream segments of the oil industry.

Another limitation of this study is the use of qualitative data obtained from semistructured interviews. Data collection for future research could include analysis of company documents which would increase our understanding on how organizational internal policies influence the implementation of risk management strategies and corroborate the findings from the interviews. Documentation is useful in case study research to support information from other sources (Yin, 2018). In addition. The use of qualitative data limits the explanation further and in detail, each result from a quantitative perspective. Future researchers can use the quantitative method to study the relationship between the different management strategies and supply chain performance in the oil industry.

In conclusion, future research should explore the effectiveness of emerging technologies on risk management and how Jamaican oil supply chain managers can utilize technology to proactively assess and manage risks in the supply chain.

Reflections

The journey towards the completion of my doctoral study was challenging but offered tremendous rewards. My objective was to increase my knowledge about the risk management strategies which supply chain managers use to manage risks in the oil supply chain and remain profitable. In the preparation of my study, I had some preconceptions derived from my experience in the oil industry as a marketer. One preconception was the assumption that the development and implementation of effective risk management strategies in the supply chain was the individual responsibility of each company as opposed to a collective effort by the supply chain stakeholders. Through the

literature, I discovered that collaboration is a key strategy in supply chain risk management and risk mitigation. The findings of my study also revealed the essentiality of collaboration in the Jamaican context. The participants discussed the need for intercompany collaboration including partnerships with regulators, competitors, and suppliers.

Another assumption that I developed based on my observations prior to the study was that supplier selection was of paramount importance to companies in the supply chain. Consistent with my assumption, the literature review and the study findings indicated that sourcing is a strategic risk management tactic in the supply chain. The literature highlighted that the selection of suppliers is integral to the successful performance of the supply chain.

The knowledge I garnered through this study was vast and enlightening. The information I unearthed in the literature showed that supply chains which are stable, resilient, and flexible are in a better position to manage risks effectively. In addition, sourcing, collaboration, and innovation are some of the effective risk management strategies which managers implement in the supply chain. These learnings are in alignment with the findings from my study.

From the result of my study, it was evident that the participants responded proactively to most risks which are inherent in their companies' supply chain and adopted a flexible approach to mitigate against any emerging risks. The participants also underscored the importance of collaboration and sourcing as effective strategies in gaining competitive advantage.

During this study, I obtained a detailed and in depth understanding of supply chain risks and risk management, which are subjects of great interest to me academically, and professionally. Notwithstanding the challenges along the journey, I gained value that is unparalleled to any other learning experience.

Conclusion

In this qualitative multiple case study, I explored the strategies Jamaican oil supply chain managers use to manage supply chain risks in the oil industry. Findings were gleaned from the experiences of eight supply chain managers from five oil companies in Jamaica. Results from the study indicated that supply chain risk management requires an understanding of the risks, knowledge of the risks' sources, and the ability to respond timely and effectively through adaptability, flexibility, and resilience to lessen the adverse effects of the risks. In addition, further effective risk management can occur through strategic partnerships and collaborative relationships characterized by communication, trust, and knowledge sharing with supply chain stakeholders. Supply chain managers should be aware that companies can gain competitive advantage through their ability to be responsive to supply chain risks.

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Appendix: Interview Protocol

The purpose of this interview is to explore strategies that Jamaican oil supply chain managers use to manage risks effectively in the oil supply chain. I will use the following guidelines to conduct the interview:

I will introduce myself to the participants.

1. I will provide an overview of the interview process and the purpose of the study.
2. I will inform the participants that the information gathered will be kept confidential and discuss the recording of the interview.
3. I will advise the participants of the right to stop the interview at any time without penalty.
4. I will end the interview by thanking the participants for their participation and thereafter conduct member checking.

Interview Questions

1. What are the primary supply chain risks faced by your company?
2. Based upon your experiences, what are the drivers of the risks that exist in your company's supply chain?
3. Based upon your experiences, how have the risks you described affected your company's operations and performance?
4. What strategies do you employ to address these risks?
5. What challenges have you encountered in the implementation of the risk mitigation strategies?

6. How did your organization address the key challenges to implement the strategies for the mitigation of supply chain risks?
7. Based upon your experiences, how do the strategies that you employ mitigate these supply chain risks.
8. What additional information, if any, would you like to share on the strategies that you use to mitigate risks in the supply and distribution process of your organization’s supply chain?