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Strategies to Mitigate Supply Chain Disruption Risks

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Walden University

College of Management and Technology

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Daniel Haloukas

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2019

Abstract

Strategies to Mitigate Supply Chain Disruption Risks

by

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MBA, University of New Haven, 1999

BA, Manhattanville College, 1993

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

April 2019

Abstract

Businesses with global supply chains typically have a minimum of 1 interruption to their supply chain annually, which can decrease profitability and affect overall company performance. The purpose of this multiple case study was to explore strategies personal care business supply chain managers used to mitigate supply chain disruption risk. The targeted population was 9 supply chain managers working in 5 different Fortune 500 consumer packaged goods personal care companies in the northeastern United States who have successfully used strategies to mitigate supply chain disruptions. Corporate risk management was used as the conceptual framework of the study to determine how company leaders plan for supply chain disruptions and how leaders prioritize and resource implementation and assessment of these plans. Data collection included semistructured interviews, with review of each company's documents as the secondary source of data. Data were analyzed using thematic analysis. Two main themes emerged: identification of a qualified alternative supplier is a common strategy in supply chain disruption mitigation plans, and business top management support is essential in the execution of supply chain disruption plans and strategies. Results of this study might contribute to social change by empowering supply managers to make alternative choices relative to suppliers that will make products more affordable to consumers. An empowered supply management team leads to high return of investments for companies, which can support employment and additional tax revenue to support social programs.

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Dedication

Jennifer, my bride: Thank you for all of your support through this experience. I couldn't have done it without you! Through all of the late nights and weekends I sacrificed from the family, you were always there for me, my rock. I dedicate this academic accomplishment to the support of my parents in the pursuit of my education throughout my lifetime. Their financial self-sacrifice is an inspiration to me in the raising of my children and pursuit of my aspirations.

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Section 1: Foundation of the Study

There is typically one annual supply chain disruption for businesses with global supply chains (Njegomir & Rihter, 2015). These disruptions can affect profitability and company performance (Sawik, 2014). To mitigate supply chain disruptions, companies need to implement risk mitigation strategies; however, researchers have found that supply chain managers, especially in personal care companies, lack these strategies (Revilla & Sáenz, 2014; Sawik, 2014). In this section, I present the background literature on the problem as well as the significance of conducting a study on mitigation strategies toward supply chain disruption. I also provide an overview of the study, including the purpose, definitions of key terms, as well as assumptions, limitations, and delimitations of the study.

Background of the Problem

Despite research and advancements in supply chain performance, supply chain disruptions now occur with greater frequency and intensity, with greater consequences as a result (Revilla & Sáenz, 2014). From disruptions to the supply chain, companies can experience losses of revenue and incur high recovery costs (Kim & Tomlin, 2013; Lewis, Erera, Nowak, & White, 2013). Managers continue to be concerned with the effects of supply chain risks. Firms affected by supply chain risks have suffered from poorer supply chain performance (Sawik, 2014). Factors like product availability, on-time delivery, necessary inventory, and capacity in the supply chain impact a firm's ability to meet customer requirements in a responsive manner (Revilla & Sáenz, 2014). Furthermore, supply chain risks can impact the firm's financial performance, profitability, sales, and

asset utilization (Sawik, 2014). Managers must therefore seek out risk mitigation practices that support efficient and strong supply chain networks and adopt methods for identifying and measuring potential sources of risk (Revilla & Sáenz, 2014). As supply chain disruptions can have long-term negative effects on a firm's supply chain performance, competitiveness, and financial performance, firms need to implement effective and proactive supply chain disruption risk management to address their vulnerabilities (Sawik, 2014).

Problem Statement

Businesses with global supply chains typically have a at least one interruption to their supply chain annually (Njegomir & Rihter, 2015). Corporate management is focused on the *80/20 rule* with supply chain disruptions (where 20% of the supply base consumes 80% of budgetary spending), which emphasizes the potential savings of risk mitigation efforts (Krasteva, Sharma, & Wagman, 2015). The general business problem is the reduction of profitability that Fortune 500 CEOs of consumer-packaged goods (CPGs) companies experience through supply chain disruptions. The specific business problem is that some personal care business supply chain managers lack strategies to mitigate supply chain disruption risk.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies personal care business supply chain managers use to mitigate supply chain disruption risk. The population included nine supply chain managers from five Fortune 500 CPG personal care companies in the northeastern United States who have successfully used

strategies to mitigate supply chain disruptions. Supply chain managers determine and implement strategies to mitigate any supply chain disruptions and therefore were the most appropriate population for the study. The results of this study can create social change by providing information on better management of company assets, which can enable more effective use of resources while reducing costs for business and consumers. Reduced costs can result in more resources being available to consumers for increase to their standard of living and provide other benefits.

Nature of the Study

Qualitative studies involve the exploration of the meaning of participants' experiences (McCusker & Gunaydin, 2015). The goal of researchers using a qualitative approach is to answer research questions through interacting with participants who have experienced the phenomenon under study. Qualitative research proceeds through inductive inquiry, resulting in insights grounded in collected data (McCusker & Gunaydin, 2015). Researchers use the qualitative methodology when key elements of phenomena are unknown (Yin, 2013). In contrast, researchers use quantitative methods to examine the relationships and differences among variables (McCusker & Gunaydin, 2015) and proceed deductively by examining clearly defined variables (Frels & Onwuegbuzie, 2013). The quantitative method was not chosen because exploring actual experiences addressed the business problem. Additionally, the mixed method approach involves the collection of quantitative and qualitative data and requires defined variables (Plano Clark & Ivankova, 2015), which the study did not have.

Central qualitative designs include a case study, narrative research, and phenomenology (Naidu & Patel, 2013). A narrative design involves interpretations of the individually experienced phenomenon, and the results are not broadly applicable (LeCompte & Schensul, 2013). Although this study involved interpretation of individual experiences of a phenomenon, it was not the narrative or stories typically collected in narrative research (see Givens, 2008). The focus of this study was on the strategies used and implemented to effectively mitigate disruptions risks. Further, researchers use ethnography to focus on the customs of people and cultural groups (LeCompte & Schensul, 2013), which was not the intent in this study. Finally, phenomenological studies involve the development of thick and rich descriptions through an understanding of participants' lived experiences (Moustakas, 1994), which was not the focus of this study.

I used a multiple case study design for the current study because researchers using case study designs seek a better understanding of a specific business problem (Yin, 2013). Case study researchers also use multiple types of data to create explanations of phenomena (Yin, 2013). A multiple case study design was appropriate for studying a real-life phenomenon in the context of the phenomenon through the people who experience the phenomenon (Yin, 2013). Additionally, the use of a multiple—rather than a single—case study is appropriate for comparing and contrasting units of analysis (Yin, 2013). In this study, the experience of supply chain managers concerning the phenomenon of supply chain disruption was the unit of analysis.

Research Question

What strategies do personal care supply chain managers use to mitigate supply chain disruption risk?

Interview Questions

1. What is your history in mitigating risk within the supply chain?
2. What strategies do you use to reduce and manage supply chain disruption risk?
3. How have you updated supply chain disruption risk mitigation strategies over time?
4. What, if any, barriers did you encounter in developing and implementing supply chain disruption risk mitigation strategies?
5. How, if needed, did you address barriers in developing and implementing supply chain disruption risk mitigation strategies?
6. How did you assess the effectiveness of the strategies you employed?
7. How have your experiences with the strategies for reducing and managing supply chain disruptions influenced your plans for responding to a supply chain crisis moving forward?
8. What additional information can you share regarding strategies to mitigate supply chain disruptions?

Conceptual Framework

I used corporate risk management as the conceptual lens through which to view the results from my study. There is no single theory of corporate risk management

(Dionne, 2013). The developed goal of the concept is for corporate leaders to alleviate the risk of financial disruption (Dionne, 2013). Disruption in the supply chain has negative outcomes, as it can cause a ripple effect to all the components of a supply chain (Amin & Zhang, 2013; Ivanov, Sokolov, & Dolgui, 2014; Qiang, Ke, Anderson, & Dong 2013). Corporate risk management contains components linked to strategic objectives that help organizations in making decisions (Dionne, 2013). Organizations use corporate risk management to protect themselves against potential risks and disruptions, particularly in relation to lessening the negative financial impact of these risks and disruptions (Dionne, 2013).

One of the tenets of the corporate risk management framework is the identification of potential strengths and weaknesses within their supply chains and determining active and practical ways of minimizing noted weaknesses and mitigating potential risks (Dionne, 2013). Another tenet is to compare and contrast with other organizations' supply chains (Dionne, 2013). The information from the comparison regarding their size, type, and infrastructure assists in contingency planning in organizations.

In supply chain management, the strengths and weaknesses of the process were evaluated for the companies in this study. The corporate risk management lens provided the study with a means of determining (a) whether company leaders planned appropriately for supply chain disruptions and (b) whether they effectively resourced these plans' implementation and assessment. Through this theory, I was able to determine strategies used to mitigate supply chain disruption.

Operational Definitions

Supply chain disruption: Supply chain disruption is when an event or a factor occurs in the supply chain process. A supply chain disruption also interferes with normal business operations of the firms involved in the supply chain (Wagner & Bode, 2008).

Supply chain risk: Supply chain risk refers to any negative change or departure from an expected process, function, or performance measure within a supply chain that could lead to issues or adverse outcomes for companies (Wagner & Bode, 2008).

Assumptions, Limitations, and Delimitations

A description of the assumptions, limitations, and delimitations of the study are contained in this section. Assumptions are elements of a study that are out of a researcher's control (Givens, 2008). Research cannot exist without assumptions (Leedy & Ormrod, 2010). Limitations are possible weaknesses of a research study that are out of a researcher's control (Givens, 2008). Delimitations are within the researcher's control and identify the boundaries of the research (Givens, 2008). Delimitations limit the scope of the study (Givens, 2008).

Assumptions

Assumptions are facts considered to be true but are not verified (Givens, 2008). Assumptions carry risk and should be treated as such. One assumption of this study was that participants provided honest and detailed responses to interview questions. Another assumption was that supply chain managers were most knowledgeable within the company to describe strategies toward mitigating disruptions to the supply chain. An

additional assumption was that the participants I recruited are from national personal care companies that produce personal care and personal products.

Limitations

The study was limited to the responses of the participants. Although a researcher can control the population and sample size, the researcher has no control on the responses of the participants, and a researcher has no way of knowing whether the responses are truthful. To mitigate this limitation, the participants were assured of the confidentiality of their personal information, which included their names and the company they associate with. Another limitation of this study was the availability of the participants. Due to their busy travel and in-office schedules, it was necessary to conduct the interviews by e-mail.

Delimitations

Delimitations refer to the bounds or scope of the study (Givens, 2008). The study included supply chain managers of personal care companies located in the northeastern United States. Other employees of the personal care companies in that area were not asked to participate in the study. The sample consisted of nine supply chain managers. The data sources of the study consisted of interviews and researcher notes, which were the most appropriate for gaining in-depth descriptions of the strategies used to mitigate supply chain disruption risks. I did not use any other data sources for the study. I conducted this research to learn effective strategies for mitigating disruption risks and improving efficiency management of resources in other industries.

Significance of the Study

Supply chain disruption risk mitigation strategies can result in cost-effective practices that increase revenues and share values for companies. Cost-effective practices can improve production as well as overall company performance. Supply chain managers of personal care companies could learn the effective strategies from the participating personal care companies that they could potentially implement in their own company. This could mean less time spent on trial-and-error implementations, which saves the company costs. Thus, the more learned about mitigation strategies, the greater the productivity, potential profit, and overall performance of a company.

Contribution to Business Practice

Managers can gain insights regarding mitigating supply chain risks from data collected in the study. The results of this study can add value to Fortune 500 CPG and other companies by providing data to enhance business operations. This information could be useful for developing strategies for managing disruptions to the supply chain. The results from this study can also apply to other company types and industries for enhancing their ability to mitigate supply chain disruption risk, increasing efficient use of resources across multiple industries.

Implications for Social Change

Employing better supply chain disruption risk mitigation strategies can help companies construct more developed and effective supply chain management plans. Leaders implementing these strategies can help companies be successful and, through more effective supply chain management, grow their research and development through

innovation (Wagner & Neshat, 2012). Consumers may benefit from innovations through the ability to purchase affordable products and fulfill their needs. Successes in supply chain disruption risk mitigation can also enable companies to produce products more efficiently, to the benefit of consumers, through the proficient use of resources. In addition, the long-term preservation of a company's operations ensuring stock price longevity can offer increased employment for future generations. Finally, through improved risk mitigation strategies, supply chain managers can produce more cost-effective products for consumers through lower prices stemming from a more efficient and effective supply chain (Altug & van Ryzin, 2014).

A Review of the Professional and Academic Literature

In this review, I present a summary of relevant literature to establish what data already exists on supply chain disruption risk management. To conduct this research, I used search engines such as Google and platforms like Google Scholar, ProQuest, EBSCOHost, Elsevier, JStor, and Emerald Insight to find the most relevant studies and information related to the topic. Search terms included combinations of the following keywords: *personal care, supply chain management, supply chain disruption, consumer packaged goods, risk, business, strategies, innovation, companies, assets, resource utilization, cost-effective practices, value, interruption, and profitability*. I included the most relevant studies generated from the above keywords/keyword combinations in the literature review. I included a final total of 76 sources in the literature review. Of these, 64 studies (85%) were published between 2013 and 2017. I also used 12 (15%) germane

studies published in or before 2012. I ensured that I selected peer-reviewed studies, which accounted to more than 70 of the sources used (92%).

The remainder of this review is structured as follows: First, I present a more comprehensive discussion around the conceptual framework. Then, the reviewed studies are organized into the following categories: (a) supply chain disruption risk management, (b) methods of and approaches to risk management, (c) innovation, and (d) sustainability. I provide relevant subheadings to further assist the discussion. Each of these categories and subheadings highlight aspects of supply chain disruption risk management, and where applicable will be applied to the topic of personal care and CPG companies. Finally, I establish a conclusion regarding the most important findings of the review. I also discuss the literature gap as per the information gained from the reviewed sources.

Corporate Risk Management

The conceptual framework was based on corporate risk management (Dionne, 2013; Wagner & Neshat, 2012). The idea behind corporate risk management is for companies to protect themselves against potential risks and disruptions and lessen the negative financial impact of these risks and disruptions (Dionne, 2013). To find, assess, and manage disruption risk, companies often use financial projections, insurance, legal and internal policies and regulations, and risk modeling (Dionne, 2013). Furthermore, they often attempt to find vulnerabilities within their supply chains and then proceed to categorize, measure, and compare these in relation to company ability, policies, and performance requirements (Wagner & Neshat, 2012). In other words, depending on the goals of a company and the resources at their disposal, managers will try to find ways of

strengthening vulnerable areas within supply chains by employing methods and policies that align with the company. This requires risk managers to analyze the logistics of implementing risk prevention strategies (Wagner & Neshat, 2012).

The conceptual framework presented a means for seeing how well managers in this multiple case study approach risk disruption management. It allowed for an understanding and interpretation of these managers' planning; logistics management; means of locating and addressing problems in various areas across their supply chains; and the kinds of techniques, methods, and analytical approaches toward risk disruption management (Dionne, 2013; Wagner & Neshat, 2012). It also provided a means for finding out how these participants approach unforeseen risks and establish risk management for the future (Dionne, 2013). Additionally, many companies already have risk management policies and protocols in place (Hida, 2015). The participants in the study were expected to understand what corporate risk management entails in relation to both their industry and their company. The broadness of this framework allowed for a comprehensive understanding into supply chain disruption risk management, which is at the heart of this study.

Supporting Theories

Agency theory. Researchers use agency theory to explain the relationship between principals and agents in business (Zsidsin & Ellram, 2003). Agency theory is concerned with resolution of problems that can exist in various relationships in an agency due to unaligned goals and differences in aversion levels to risk. The main objective of agency theory is to address problems between the principal and agent. These problems

emerge because of differences in goals and desires between the two. Another major concern of agency theory is handling levels of risk between a principal and an agent. In most situations, agents use the resources of a principal. In this case, the agent is the decision-maker but will incur little to no risk because all the burden will be on the principal.

Agency theory has been used in managing supplier behaviors to reduce supply risk and the consequences of these risks (Zsidisin & Ellram, 2003). Organizations address supply risk through implementation of techniques that reduce the likelihood of detrimental events that will occur. Factors such as firm size, percentage of sales, and industry characteristics influence supplier behaviors.

Both agency theory and corporate risk management address risk in companies and businesses (Zsidisin & Ellram, 2003), though the two have different approaches in managing risks. The focus of corporate risk management is to manage risks and ensure that the consequences are not detrimental to the company. The focus of agency theory is to understand the relationships and how to avoid the risks through knowledge and understanding of the relationship between agents and principal.

Contingency theory. Researchers use the contingency theory to explain that factors specific to the situation can affect the direct relationship between independent and dependent variables in the field of organizational behavior (Otley, 2016). In organizational behavior, the independent variables are the cause of change in the dependent variable, whereas the dependent variable is a response due to the independent variable. The independent variable in risk management is the different strategies and

techniques implemented to avoid problems in the organizational processes. The dependent variable is whether the problems are appropriately addressed by the strategies and techniques. Having different programs and plans to manage risks avoid the consequences of risks in the financial and operation of the company.

Supply Chain Disruption Risk Management

There are numerous aspects related to supply chain management and managing disruption risks within supply chains. Some of these aspects include means for maintaining resilience within a supply chain; the role of insurance, revenue sharing, and industry needs on supply chains; and how different types of supply chains operate. For example, previous researchers have explored the ripple effect of supply chains and its implications to the whole process. The ripple effect means that if one part of the supply chain is disrupted in some way, that disruption carries through to each subsequent link (Ivanov et al., 2014). This ripple effect can impact both large and small supply chains, regardless of their structure (Amin & Zhang, 2013; Ivanov et al., 2014; Qiang, Ke, Anderson, & Dong 2013). By having a clear understanding of the ripple effect and how to minimize disruptions across supply chains, managers can better mitigate potential disruption risks (Baghalian, Rezapour, & Farahani, 2013; Ivanov et al., 2014). However, there is little research on how to minimize disruption, and there is a need for future research on the dynamics, control, continuity, and management related to supply chain and disruptions to determine how companies could better their profitability (Ivanov et al., 2014). Such research would aid companies in developing stronger and more flexible supply chains that would not be adversely affected by disruptions and the ripple effect

(Ivanov et al., 2014). The current study, in part, meets some of these research requirements.

One type of supply chain is called closed-loop, which includes an element of recycling, whereas linear supply chains end with consumers and disposal. Moreover, closed-loop supply chain companies need to process or recycle their product back into the supply chain, reusing elements to continue the cycle or chain (Amin & Zhang, 2013; Qiang et al., 2013). This type of supply chain requires different management approaches to linear structures, though it still has similar risks and disruptions (Amin & Zhang, 2013; Qiang et al., 2013). Closed-loop supply chain managers should first identify the finite-dimensional variational inequality problem within the chain and from there conduct problem-solving and risk management (Qiang et al., 2013). Managers should take factors such as the environment and demand and return uncertainties into account when attempting to manage such chains (Amin & Zhang, 2013).

Other types of supply chains include multi-company supply chains. These are supply chains that work across numerous companies and usually involve outsourcing certain supply chain tasks (Baghalian et al., 2013; Cao, Wan, & Lai, 2013; Linares-Navarro, Pedersen, & Pla-Barber, 2014; Rigby & Bilodeau, 2015). This type of supply chain also experiences disruptions. A disruption, particularly at the manufacturer's end, could negatively impact production costs and demand (Cao et al., 2013). Uncertainties, especially in relation to multi-company players and supply and demand uncertainties, could have a negative impact on multi-company supply chains (Baghalian et al., 2013). However, revenue sharing may work to mitigate such uncertainty and benefit multi-

company supply chains (Cao et al., 2013). A penalty cost may also assist the company directly affected by the disruption to recoup some of their losses, mitigate further risk and negative impact, and allow all involved in the chain to benefit in the long run by carrying some of the burden of the risk in the short term (Cao et al., 2013).

Another method for bettering risk and disruption management also includes companies' strategically locating facilities and inventory to avoid concentration of product that could lead to larger losses or damages were a risk or disruption to occur (Baghalian et al., 2013). Although spreading parties and functions within a supply chain over a wider area could lower risks, it also comes with more logistical and organizational demands, which requires clear management (Baghalian et al., 2013; Wisner, Tan, & Leong, 2016).

Regardless of which supply chain a company employs, insurance against risk and disruption is key. Insurance can take the form of financial insurance against loss, for example, but could also be extended to using revenue sharing as a means of insurance against stakeholder neglect or disruption (Altug & Van Ryzin, 2014; Cao et al., 2013; Njegomir & Rihter, 2015). For a supply chain to remain sustainable, companies need to have the financial wherewithal to bounce back from losses and disruptions (Altug & Van Ryzin, 2014; Njegomir & Rihter, 2015). Therefore, acquiring the best insurance to guard against various risks specific to a company is important (Njegomir & Rihter, 2015). Insurance cannot safeguard against all risk, but it is also riskier to go uninsured or underinsured if anything negative were to happen along the supply chain. Insurance and

molding insurance for the specific needs of a company form a crucial part of risk management in supply chain management (Njegomir & Rihter, 2015).

Another area related to the financial viability and sustainability of a company and supply chains involves revenue sharing between companies who do business with one another or who form part of a larger supply chain (Altug & Van Ryzin, 2014, Cao et al., 2013). Revenue sharing allows companies to benefit from mutual revenue generation, which can be used to mitigate the effects of risks or disruptions along the supply chain as and when they occur (Altug & Van Ryzin, 2014; Cao et al., 2013). Other industries may learn from the video rental industry, which has shown how revenue sharing was used to the benefit of the companies involved (Altug & Van Ryzin, 2014).

Although it is important to understand the types of supply chains in operations and measures for managing and mitigating risks within these different types of supply chains, it is also valuable to understand how supply chains operate within companies as well as between and across different supply chains and companies (Baghalian et al., 2013; Cao et al., 2013; Linares-Navarro et al., 2014; Rigby & Bilodeau, 2015; Schönsleben, 2016). This refers to integral logistics management, which is focused on implementing methods and approaches to improve interactions and supply chain management across internal and external supply chains (Schönsleben, 2016). It is also related to finding practical solutions to problems that benefit all parties involved, as conceptualization and research is not enough to aid the everyday workings of supply chains (Baghalian et al., 2013; Cao et al., 2013; Schönsleben, 2016). More practical and implemented focus on improving objectives, management principles, manufacturing, and

entrepreneurial innovation could benefit and grow supply chain management (Schönsleben, 2016). This means that managers need to design and control supply chains across networks to benefit all involved (Altug & Van Ryzin, 2014; Schönsleben, 2016). It would also require companies to find ways of developing strategic and logistical planning and management within supply chain design (Dionne, 2013; Schönsleben, 2016; Wagner & Neshat, 2012).

Because this current study revolved around supply chain management, it is important to understand the methods and approaches for managing risk in a supply chain context. Additionally, there is a lack of study around practical implementation of theoretical methods for management (Janvier-James, 2012). For instance, Colicchia and Strozzi (2012) found that knowledge sharing across supply chains was of great benefit, but much research has not provided practical, real-life results of these methods. Janvier-James (2012) also suggested that supply chain, risk, and distribution management were all interlinked and that improving on each individually, companies could address supply chain disruption risk more holistically. Furthermore, it is important for companies to set management structures and policies in place, at various levels of supply chains, to best mitigate risk (Hoffmann et al., 2013). Uncertainty and risk management impacts company and supply chain performance, and more mature risk management processes are better at mitigating risk and navigating uncertainties (Hoffmann et al., 2013). Constant monitoring and assessment of implemented supply chain disruption risk management processes is important, as emphasized other studies (Chance & Brooks, 2015; Haimes,

2015; Hammoudeh, Santos, & Al-Hassan, 2013; Hoffmann et al., 2013; Matta, Chahed, Sahin, & Dallery, 2014; Naidu & Patel, 2013).

For a practical example of supply chain management, Narayana, Pati, and Vrat (2014) researched supply chains within the pharmaceutical industry. They noted an increased interest in how best technology and innovation could be used to strengthen further and improve supply chains themselves as well as the management (Narayana et al., 2014). Changes in industrial interaction, innovation, and technology imply the need for new ways of management, particularly in relation to manufacturing and distribution (Altug & Van Ryzin, 2014; Narayana et al., 2014; Schönsleben, 2016; Wagner & Neshat, 2012). Based on the information in this section, the best means for managing risk are related to improving management structures; however, there has not been much information regarding practical implementation and results for supply chain disruption risk management, which substantiated the need for this study.

Measuring and Modeling Supply Chains/Chain Disruption

For supply chain management and disruption management to be effective, it is important for companies to be able to measure implemented strategies' effectiveness. Companies also need to model and predict possible disruptions within chains to take a proactive rather than reactive approach to problem-solving for disruptive events. In this subsection, I present some research into measuring and modeling.

Previous researchers have highlighted the need for a clear understanding and a better definition of supply chain disruption and vulnerability, and the ability to measure these across different types of companies could ensure fewer disruptions to supply chains

(Snyder et al., 2016; Wagner & Neshat, 2012). Wagner and Neshat (2012) compared means of measuring supply chain vulnerability for different types of companies, while Snyder et al. (2016) reviewed models for supply chain disruptions. Modeling could provide managers with the needed accuracy to make such assessments and gain better understanding of potential risks and disruptions (Snyder et al., 2016; Wagner & Neshat, 2012). For example, Wagner and Neshat used normal accident theory and high-reliability theory to create a model for more accurate measurements, and Matta et al. (2014) presented the integrated definition for function modeling as a potentially viable model. Snyder et al. (2016) presented the idea that different models could be used or adapted to suit the needs of a company and improve risk management around supply disruptions, strategic decisions, sourcing decisions, contracts and incentives, inventory, and facility location. Such models could also go a long way in assisting managers to determine, and more importantly effectively manage, the level of vulnerability within supply chains (Wagner & Neshat, 2012).

Several researchers noted other factors that could further assist managers, outside of modeling, that include knowledge regarding company size, structure, product type, and the ability of managers to break supply chain processes into smaller categories (Snyder et al., 2016; Wagner & Neshat, 2012). The ability of managers to categorize processes would benefit and streamline their problem-solving and evaluation approaches (Snyder et al., 2016). In all, the managers must have various means of measuring and understanding both disruption risks and implemented solutions' effectiveness is important for proper supply chain disruption risk management.

Furthermore, as I focused this study on supply chains in a personal care context, the study of Matta et al. (2014) contained much needed information. These authors established how best to model personal care operations and supply chain management. They found that if managers paid attention to such factors as the personal care industry's role as a means of reducing governmental health care costs, changes in population demographics, social changes, and innovations within the industry, they could better manage supply chains and meet client needs (Matta et al., 2014). They also noted that the integrated definition for function modeling could work well for describing and understanding the most relevant clinical, logistical and organizational processes related to personal care operations (Matta et al., 2014). This was because by combining an evaluation into the factors above, and using the integrated definition for function modeling for modeling processes, supply chain managers could more accurately predict and manage risks within their supply chains (Matta et al., 2014). The studies I presented in this section gave me the information needed for accurate measurement and evaluation of supply chain processes and disruptions as a means of mitigating risk and improving supply chain performance.

Principles and Logistics of Supply Chains

Related to the idea of measuring and modeling supply chains and supply chain disruption management is that of what principles a company could best implement for ensuring the success of supply chains. Similarly, companies must consider the logistics involved in supply chain management, and what effect any changes in such management would mean in the long term. While Wagner and Neshat (2012) focused on measuring

aspects within supply chains, it is also important to understand how best to establish and apply clear principles for supply chain management (Rushton, Croucher, & Baker, 2014; Wisner et al., 2016).

Managers need to focus on areas within purchasing, operations, logistics, distribution, and processes integration, as these areas provide a more holistic and balanced view of what supply chain management entails (Rushton et al., 2014; Wisner et al., 2016). Some of the principles highlighted in the work of Wisner et al. included focusing on supplier relationship management, planning resources, maintaining customer relationships, and understanding the individual components that made up a specific company's supply chain network. Some of their findings were substantiations of the earlier work of Rushton et al. (2014), who established that implementation of principles and maintenance of resources could work to improve supply chains.

Managers should be clear about flow within their supply chains and the relation and interlinked nature of individual units within larger chains (Rushton et al., 2014; Wisner et al., 2016). This includes understanding how end-product manufacturers impacted and were impacted by such players as raw materials suppliers and distributors, as well as how growing and changing supply chains required unique logistical implementations suited to the specific chain (Rushton et al., 2014; Wisner et al., 2016). By understanding the principles, logistics, and demands on a supply chain, as well as the global nature and trends related to supply chain management, managers could more accurately determine where to place necessary resources, innovations, or changes in

design or delivery systems, and, thereby, improve their supply chain performance and subsequent company profits (Rushton et al., 2014; Wisner et al., 2016).

Christopher (2016) substantiated the findings of Rushton et al. (2014) and Wisner et al. (2016) by further establishing the logistics involved in supply chain management. Of note for Christopher (2016) was that companies could no longer address supply chain management as an individual company concern and that they should rather focus on developing principles and logistics for bettering their supply chains across multiple companies and players. That meant that companies would need to create supply chains that were flexible or more responsive, and that could adapt quickly and easily to changing business landscapes, customer needs, and that could be involved in collaboration without causing disruptions, delays, or issues for the company (Christopher, 2016; Roh, Hong, & Min, 2013). The more adaptable supply chains and supply chain management can be, the more likely it is for companies and their supply chains to navigate and withstand potential risks (Christopher, 2016; Roh et al., 2013).

To create such flexibility, managers should attempt to ensure proper socio-relational as well as techno-process integration on a consistent basis to prepare both policies and human resources for potential changes and risk management strategies (Roh et al., 2013). In other words, if all stakeholders are adequately prepared, it is more likely that supply chains will have the needed flexibility for smooth operations. The researchers in this section established that if companies could employ management strategies that would benefit their unique supply chain practices and needs, while still fitting into the

broader requirements of their industries, it would become more likely for their supply chains to be successful.

Disruption Management

While the previously mentioned research focused on establishing means of understanding supply chains and modeling and predicting disruptions, it is also important to address means of reducing the risk of disruptions. For example, Chopra and Sodhi (2014) and Park, Hong, and Roh (2013) both focused on how companies could learn from supply chain disruptions in the aftermath of natural disasters and find ways of bouncing back from such disruptions. Chopra and Sodhi (2014) found that while traditional attempts at mitigating disruptive influences within supply chains, such as increasing inventory, adding capacity at different locations and having multiple suppliers worked to an extent, they also minimized the efficiency and often heightened the costs involved in the running thereof.

The management of information design, portability, and dispersion is also needed (Park et al., 2013). Chopra and Sodhi (2014) found that companies had done little to actively improve supply chains and mitigate disruptions, outside of the traditional attempts. This was, in part, due to companies weighing solutions against cost, as opposed to focusing on supply chains outside of cost-benefit analysis (Chopra & Sodhi, 2014). The authors called for more research into more cost-effective disruption management efforts (Chopra & Sodhi, 2014). Revilla and Sáenz (2014) and MacDonald and Corsi (2013) also attempted to shed light on how best to manage supply chain disruptions, particularly considering the increased global supply chain activity. Revilla and Sáenz

(2014) found that it was more likely for companies to experience disruptions across their global supply chain, simply due to the added logistics and issues caused by a factor such as distance. Revilla and Sáenz also believed that it was important for global supply chain disruption management frameworks to take both company (i.e., convergent) and national (i.e., divergent) issues into account. This meant that supply chain managers would have to be able to function within such frameworks, while also improving their personal decision-making abilities and general skills to best assist the company in recovering after disruption (MacDonald & Corsi, 2013).

Through their empirical sampling of 1,403 companies across 69 countries, Revilla and Sáenz's (2014) findings revealed that different risks presented, depending on the location, but that common risk management practices could still be applied. By understanding that every new disruption or risk did not require new approaches, it could lessen managers' time in addressing issues. Once risk mitigating principles and practices have been proven to work, companies can simply modify such principles and practices to their specific company needs, as opposed to approaching risk and disruption management from a clean slate. In turn, this would lead to an improvement in profits lost during disruption and a quicker recovery time (MacDonald & Corsi, 2013).

Similarly, Schmitt and Singh (2012) analyzed disruption risk in multi-tier companies. While other researchers attempted to understand supply chains from a *part within the whole* approach, these researchers believed that viewing supply chains holistically from the start could shed better light on how to manage disruptions (Schmitt & Singh, 2012; Snyder et al., 2016; Wisner et al., 2016). In particular, the researchers

believed that enhanced management around product placement and backup plans could improve supply chain disruption management (Schmitt & Singh, 2012). Furthermore, they found that disruptions themselves, along with demand uncertainty, influenced how managers went about disruption management (Schmitt & Singh, 2012). Schmitt and Singh believed that better understanding and modeling of potential disruptions and demand would assist managers. Schmitt and Singh presented the idea that making use of networks within multi-tier companies and proactive planning could work positively toward mitigating disruptions.

The sources consulted in this section provided insight into different types of supply chains and the requirements and risks involved in each. The authors of these studies also provided insight into the importance of being able to accurately monitor and evaluate supply chain disruption risk management practices, as well as providing the principles and logistics involved therein. The research included models and factors for consideration in dealing with disruptions, and experts made calls for research into global supply chain management.

Methods of and Approaches to Risk Management

It is clear through the understanding of supply chain operations that managing risk, uncertainty, and disruption are of the utmost importance for the success of any company. Once companies have a clearer understanding of their supply chain operations and management needs, it would become easier for them to apply the needed methods and approaches for managing and mitigating risk, or potential risk, within their supply

chains. Experts have conducted much research into different means and trends for mitigating risk in a variety of supply chains across numerous industries.

Rigby and Bilodeau (2015), for example, provided general information on methods, tools, and trends for modern (risk) management. The authors conducted a continual survey from 1993, updating their findings regularly to track changes in management (Rigby & Bilodeau, 2015). Their survey spanned 70 countries from most continents and consisted of over 13 000 respondents (Rigby & Bilodeau, 2015). The authors found that a company's ability to quickly and easily adapt to changes within their industry and larger economic factors assisted in their success. Increasing innovation use and reducing costs also stood companies in better stead (Rigby & Bilodeau, 2015). Rigby and Bilodeau found that recovery rates after supply chain disruptions often depended on the industry within which a company found itself. Rigby and Bilodeau also found that innovations in outsourcing, strategic planning, and relationship building between companies and consumers, proved to be successful techniques for improving supply chain disruption risk management. Their findings were like those of Chen, Sohal, and Prajogo (2013) and Ramanathan and Gunasekaran (2014), who both established that collaboration within supply chains could assist in mitigating risk. Of concern for both sets of authors was the idea of actively engaging with consumers and suppliers, and making plans and decisions by involving all stakeholders, as a means of finding issues and underperforming areas within supply chains (Chen et al., 2013; Ramanathan & Gunasekaran, 2014). By finding innovative ways to approach supply chain disruption risk management, and comprehensively engaging with players across different areas of a

supply chain, managers will better be able to not only lessen current risk, but predict and prevent possible future disruption risks (Chen et al., 2013; Ramanathan & Gunasekaran, 2014; Rigby & Bilodeau, 2015).

This tendency toward innovation linked in with the call for new frameworks for managing risks (Hopkin, 2014; Kaplan & Mikes, 2012). The call came because traditional risk management approaches often tend to rely heavily on employee compliance, and require managers to ensure that employees follow the rules (Kaplan & Mikes, 2012). Such an approach does little to prevent either the likelihood or impact of risk and disruptions occurring, particularly considering the uncertainty and the unpredictability of general life (Hopkin, 2014; Kaplan & Mikes, 2012).

Managers need to understand that different risk categories require different problem-solving approaches (Hopkin, 2014; Kaplan & Mikes, 2012). Some of these risk categories include preventable risks, strategy risks, and external risks (Kaplan & Mikes, 2012). While following rules might assist reducing preventable risks, it would not be enough for mitigating strategic risks, which involve company policy and decision-making, or external risks, which fall outside of employee and company control (Kaplan & Mikes, 2012). Managers would, therefore, also require common sense, strategic awareness, communication, and would need to partake in constant inquiry as these skills help them navigate other risk types (Hopkin, 2014). It is important for companies to assess and manage risk according to type, as well as in relation to their specific industry and company needs, and thereby implement the necessary methods and approaches for dealing productively with them (Hopkin, 2014; Kaplan & Mikes, 2012). This implies that

supply chain disruption risk management is often industry-specific, and that what methods work for one company or industry might not be suitable for another.

To best determine how to approach risk management for their specific industry, managers might wish to use analysis and risk indexes to thoroughly assess and quantify potential risk (Samvedi, Jain, & Chan, 2013). One suggestion was for managers to use fuzzy logic and analytical hierarchy processes to best determine potential risk within their supply chains (Samvedi et al., 2013). This method would assist managers in better viewing the issues and supply chain disruptions that could often be subjective in nature in a more objective way (Samvedi et al., 2013). This, in turn, could lead to better holistic viewing on problems, which could provide more comprehensive solutions that lead to more effective risk management (Samvedi et al., 2013).

Haines (2015), Chance, and Brooks (2015) provided information on how best to model, evaluate, and manage risk. These authors also established what risk management entailed. Haines (2015) addressed supply chain disruption risk management from a technical perspective; reviewing articles related to tools, technologies, and methods for assisting in the planning and construction of infrastructure; improving reliability and quality control, and accurately estimating costs schedules involved in supply chain design and management. Haines (2015) believed that the notion of probability played a key role in how accurately managers could predict, and thereby manage, risk. This notion substantiated Hopkin's (2014) idea that common sense and practicality of approach was important in risk management. Chance and Brooks (2015), on the other hand, noted how changes in technology, particularly with the advent and increased use of the internet,

information technology, and smartphones, had changed not only the potential risks for companies but also how the companies could deal with the changes.

Chance and Brooks (2015) also believed that many of the risks claimed to have been increased with the introduction of new technology, had merely had less exposure in the past. Many modern companies deal with the same (potential) risks, particularly regarding finance, that companies before the technological revolution had to. The difference now, the authors asserted, was that technology had provided more awareness of such risks, and gave opportunities for new ways of dealing with these risks (Chance & Brooks, 2015). They defended traditional risk management principles, such as collaboration, and strategic planning as still being necessary components to risk management (Chance & Brooks, 2015). In all, the literature reviewed in this section established that both traditional and new principles for dealing with disruption risk management could assist companies in better navigating and managing disruption, and improve their profits.

Evaluating Methods and Approaches

As with supply chains and companies' need to evaluate and assess the success of implemented management methods and policies, so too it is important for companies to determine whether their methods and approaches for managing risk are as effective as they could be (Heckman, Comes, & Nickel, 2014; Hida, 2015). To this end, Hida (2015) surveyed how different companies across the world managed their risk or potential risk, particularly in relation to supply chains. The author's focus was on how the financial sector dealt with risk management and determined that improving policies, as well as

providing more emphasis on the importance of the Chief Risk Officer's (CRO) role in a company went a long way to ensuring risk management. This will be dealt with in more detail later in the chapter. However, it is important to note that the importance of the CRO's role also confirmed that the manager's role within supply chain disruption risk management was valuable, and that they needed support and proper decision-making and skills development (Heckman et al., 2014; Hopkin, 2014; Kaplan & Mikes, 2012; MacDonald & Corsi, 2013; Revilla & Sáenz, 2014).

Hida (2015) also confirmed other researchers' assertion that companies had to understand their place within the larger industry, as well as their relationship to other companies and related industries within the global business sphere (Heckman et al., 2014; Njegomir & Rihter, 2015; Revilla & Sáenz, 2014; Rushton et al., 2014; Wisner et al., 2016). By adhering to national and international regulations and focusing on consumer protection, as well as developing better management programs within their companies, Hida (2015) believed that businesses would go a long way to better managing risk. These regulatory bodies could also assist companies in better measuring and assessing how well their implemented risk management strategies would fair (Hida, 2015).

Naidu and Patel (2013) and McNeil, Frey, and Embrechts (2015) attempted to determine how best to measure earnings management as a way of better determining risk levels. Naidu and Patel (2013) provided information on both quantitative and qualitative approaches specifically with regard to the quantitative performance-matched discretionary accrual model and the qualitative measure (Naidu & Patel, 2013). McNeil et al. (2015) focused more on quantitative means for risk management, particularly in

relation to the finance sector. While both sets of authors established that quantitative methods provided a base for understanding risk management, for managers to most effectively comprehend issues and proactively problem-solve, qualitative analysis was also necessary (McNeil et al., 2015; Naidu & Patel, 2013). This conclusion was made because qualitative and quantitative results often differed, due to their different ontological and epistemological focus (Naidu & Patel, 2013). While mathematical risk prediction and statistics (i.e., quantitative measurements) were necessary, managers also needed to attempt to understand the less quantifiable aspects of risk management, such as human nature (i.e., qualitative measurements; McNeil et al., 2015; Naidu & Patel, 2013). These studies highlighted that risk measurement and definition would need to be broad, particularly as the different results between quantitative and qualitative did not imply one means of measurement being better than another (Naidu & Patel, 2013). Thus, managers and researchers would need to apply the method which they deem best for the specific risk.

From the studies of McNeil et al. (2015) and Naidu and Patel (2013), it became clear that both manager skill and company regulation was needed to properly assess which methods and approaches would be best for supply chain disruption risk management. Furthermore, to adequately evaluate the effectiveness or potential benefits of such management implementations, comprehensive study and analysis in both quantifiable and qualifiable terms needed to be completed. By evaluating methods and approaches fully, it was more likely for companies to be successful in their disruption risk management endeavors.

Examples of Methods and Approaches

Now that I have provided a basic understanding of what risk management entails and how companies can go about determining the validity of a method or approach, it is important to establish the more common methods of and approaches to risk management. I included numerous researchers' work to highlight such methods and approaches. For clarity, I will present each of the work by author, with reference to similar methods and approaches, where applicable.

Marcelino-Sádaba, Pérez-Ezcurdia, Lazcano, and Villaneuva (2014) addressed the project management method approach to dealing with risk related to projects falling outside of a company's usual scope. They noted that companies required new, broader projects, such as new product design or innovation for the continued functioning and relevance of a company, but that especially smaller companies did not always consider and manage the risks related to such projects well (Marcelino-Sádaba et al., 2014). This call for innovation substantiated similar calls by other researchers, already mentioned in this study (Altug & Van Ryzin, 2014; Baghalian et al., 2013; Cao et al., 2013; Narayana et al., 2014; Schönsleben, 2016; Wagner & Neshat, 2012).

Marcelino-Sádaba et al. (2014) noted that poor project management was often due to a lack of resources and finances, which caused companies to make use of individuals who were not adequately trained in project and risk management to head their projects. The authors established the importance of a project manager's role in lowering potential risk and emphasized the need for adequate training and preparations for these managers (Marcelino-Sádaba et al., 2014). They also paid close attention to the fact that in order for

companies to manage risk well, they would have to ensure that the projects undertaken should align with their broader strategies and desired results. Otherwise, they might embark on projects where the risks outweigh the rewards (Marcelino-Sádaba et al., 2014).

While the study of Marcelino-Sádaba et al. (2014) revolved around methods for risk management in smaller companies, Ellul and Yerramilli's (2013) work focused on bettering preventative structures in the financial industry as a means of lowering risk. These authors developed an index to measure how independent and strong risk management was, particularly for companies in the bank holding industry (Ellul & Yerramilli, 2013). Using their index, companies could determine the level of potential risk related to areas of operation and stock return, nonperforming loans, and lower tail risk (Ellul & Yerramilli, 2013). The more independent and strong companies' risk management approaches were, the higher they would score on the index (Ellul & Yerramilli, 2013). These findings correlated with ideas previously set forth that responsive supply chains and proper management skills would benefit companies (Christopher, 2016; Hopkin, 2014; Kaplan & Mikes, 2012; MacDonald & Corsi, 2013; Revilla & Sáenz, 2014; Roh et al., 2013). While the index presented in Ellul and Yerramilli's (2013) study was industry-specific, risk managers in other sectors might be able to learn from or adapt the index as a means of monitoring their level of risk or success in risk management, thereby painting a clearer picture of where and how they could improve their risk management.

Park, Seager, Rao, Convertino, and Linkov (2012) dealt with means of managing risk through addressing the effectiveness of risk and resilience approaches to severe disruptions. Park et al.'s (2012) work was similar to that of Chopra and Sodhi (2014), and Park et al. (2013), in that they also particularly looked at how companies managed risk and attempted to build resilience in the wake of numerous natural and human-made disasters, such as oil spills, earthquakes, nuclear power plant accidents, or economic depressions (Park et al., 2012). Park et al. defined resilience as a company's ability to adapt to changes or disruptions without occurring extensive loss or damage in the process (Park et al., 2012). Where their work differed from the likes of Chopra and Sodhi (2014) and Park et al. (2013), the work of Park et al. in 2012 warned companies to avoid measuring resilience purely in terms of risk. These authors posited that resilience in a company was determined by the proactive nature of what a company did to manage risk, rather than the simple response to a crisis once it emerged (Park et al., 2012). The authors believed that companies that focused on continuously sensing, anticipating, learning, and adapting, regardless of what eminent risk or risk state they were in, better prepared them for positively navigating risk when it did occur (Park et al., 2012).

Hill, Jones, and Schilling (2014) used strategic management theory as a basis for, among others, risk management. These authors believed that the better strategies and policies companies and managers put in place for handling risk, and the better equipped regarding training and resources, the more likely they were in positively managing risk (Hill et al., 2014). They also noted that a better understanding of a company's position within the industry, a clear mission and company objectives, and incorporation of both

domestic and global strategies and structures would also assist companies in managing risk. All of these findings substantiated similar claims made by authors like Heckman et al. (2014), Njegomir and Rihter (2015), Rushton et al. (2014), and Wisner et al. (2016), who all also established that proper strategies, policies, and understandings of global industry and trends could assist in better risk management.

In the study of Hida's (2015), the author reiterated the work of Simba (2013) and Linares-Navarro et al. (2014) who highlighted the important role the CROs played in managing current and preventing future risk. Simba (2013) found that CROs were key to successful management of R&D networks within the pharmaceutical industry, particularly when such networks were outsourced. This was linked with CROs being important to the general management of outsourced, and off-shored, supply chain components (Linares-Navarro et al., 2014). That is, when companies choose to outsource supply chain activities, and especially when that outsourcing occurs in a global capacity, it is of the utmost importance for such outsourced processes to be managed effectively (Linares-Navarro et al., 2014; Simba, 2013). To that end, developing competent CROs and allowing them the freedom to manage risk in the ways they deem best would, in the long run, benefit companies in general, and specifically those with large supply chains operating across global networks (Linares-Navarro et al., 2014; Simba, 2013).

Prajogo and Olhager (2012) also took an interest in the human element of risk management. They believed that human resources (among other factors, such as technology and logistics), and the development of healthy relationships between parties within supply chains could assist in improving company performance and mitigate

industry-related risks (Prajogo & Olhager, 2012). This assertion substantiated the need for clear communication and collaboration across supply chain components and procedures for proper disruption risk management to occur (Chance & Brooks, 2015; Chen et al., 2013; Christopher, 2016; Hopkin, 2014; Ramanathan & Gunasekaran, 2014; Roh et al., 2013). Prajogo and Olhager (2012) asserted that improving information sharing and integrating such information with material flows and logistics would positively impact supply chain performance. This improvement and integration of elements would also assist in mitigating risk, as better lines of communication would increase access to information that could assist in risk management (Chance & Brooks, 2015; Chen et al., 2013; Christopher, 2016; Hopkin, 2014; Prajogo & Olhager, 2012; Ramanathan & Gunasekaran, 2014; Roh et al., 2013). Using information technology and other logistics and communication innovation could also assist in deepening and improving long-term party relationships, which would benefit all those within the supply chain (Baghalian et al., 2013; Dionne, 2013; Prajogo & Olhager, 2012; Rushton et al., 2014; Wagner & Neshat, 2012; Wisner et al., 2016).

Developing management was a repeated trend in the research field of risk management (Aziz et al., 2015; Heckman et al., 2014; Hida, 2015; Hopkin, 2014; Lam, 2014). Gates, Nicolas, and Walker (2012) elaborated on these previously mentioned studies by also noting the importance of management when it came to dealing with risk. Gates et al. (2012) believed that it was important for companies to take part in enterprise risk management (ERM). Gates et al. found that ERM assisted companies in improving management consensus, management decision-making, and communication. These

authors also posited that ERM led to higher levels of accountability within management (Gates et al., 2012). These elements would all lead to better risk management; when management and company leaders were all in agreement, it was easier to establish sound risk management policies and procedures (Gates et al., 2012).

Hammoudeh et al. (2013) provided practical examples from within the metals industry of how portfolio structure and management could lessen risk and improve economic standing. They believed that value-at-risk (VaR) was a means for analyzing market downside risk within companies (Hammoudeh et al., 2013). The authors also established that companies should determine their VaR in relation to unconditional and conditional coverage, as well as levels of independence within coverage and management (Hammoudeh et al., 2013). By constantly monitoring products, assets, and value under these factors, the authors believed that managers could improve their portfolio structures and thereby minimize potential risk within supply chains (Hammoudeh et al., 2013). This was in line with previous ideas presented around constant evaluation (Chance & Brooks, 2015; Haimes, 2015; Matta et al., 2014; McNeil et al., 2015; Naidu & Patel, 2013).

Another method for mitigating risk is related to improving incentives and controls (Lam, 2014). Lam believed that managing risk related to balancing risk and reward. This author highlighted the difference between positive or intelligent risks, and negative or unsafe risks, noting that business leaders often needed to take calculated risks to improve their business (Lam, 2014). Lam also pointed out that many risk management solutions could fail over time, and that it was important for leaders to approach risk management with a sense of practicality, rather than simply following the newest suggested trends.

This idea matched up with managers' need for comprehensive cost-benefit analysis, along with the implementation of other principles and traditional approaches (Chance & Brooks, 2015; Chopra & Sodhi, 2014; Park et al., 2013).

Approaching risk management with practicality also, again, highlighted the importance of utilizing trained and experienced risk managers and CROs (Hida, 2015; Linares-Navarro et al., 2014; Simba, 2013). Lam (2014) also substantiated the notion that human relations within a business context could work to company's benefit when managing risk. The author provided comprehensive information on the importance of continual risk assessment, improving risk-based decision-making, and integrating risk management into broader company operations (Lam, 2014). This further promoted a holistic view and approach to risk management (Lam, 2014; Rushton et al., 2014; Schmitt & Singh, 2012; Snyder et al., 2016; Wisner et al., 2016). While most of the approaches that Lam (2014) discussed revolved around general risk management across numerous industries, future research could extend further the ideas concerning supply chain disruption risk management.

Finally, as a practical example to the continued theme of relations and proper management across supply chains, authors noted that, especially in the food supply chain, the role of the sub-supplier manager was of great importance to the success of the entire operation (Grimm, Hofstetter, & Sarkis, 2014). When companies lack the transparency, have few open lines of communication with sub-suppliers, or hold sub-supplier managers to little value, it is likely that supply chains will be disrupted (Grimm et al., 2014). It is important, therefore, to ensure that not only are operations well managed across each area

of a supply chain, but that each player within the chain is valued and privvy to operational changes and needs (Grimm et al., 2014; Hammoudeh et al., 2013). In this way, much disruption risk within a supply chain can be mitigated. Overall, the methods and approaches presented in this sub-section worked to prove how, practically, managers could implement positive and effective disruption risk management.

Innovation

As noted throughout this literature review so far, innovation plays an important role in risk and supply chain management. Finding innovative ways of problem-solving could benefit companies financially and lower risk (Altug & Van Ryzin, 2014; Matta et al., 2014; Narayana et al., 2014; Schönsleben, 2016; Wagner & Neshat, 2012). Deptula and Knosala (2015) noted that implementing innovative projects came with risks, and believed that companies should always perform a risk assessment before implementation. They further suggested that innovation projects not only be assessed according to company needs but should also be run alongside existing innovation to see how the new introduction could complement or replace current innovative projects (Deptula & Knosala, 2015). The authors believed that such concurrent analysis would assist in reducing risks when introducing innovations (Deptula & Knosala, 2015).

Innovation is important but it must be responsible. Von Schomberg's (2013) notion of responsible innovation and the need for research before innovation and implementation took place. The author found that while the EU had attempted to provide clear guidelines on how to implement and create responsible research and innovations, uniformity of such was still lacking across various national research councils of member

states (Von Schomberg, 2013). The author believed that better, more responsible innovation and research would take place if there was more uniformity regarding what being responsible entailed (Von Schomberg, 2013). Von Schomberg also believed that such uniformity would aid in better, more accurate, assessments of new technologies, thereby limiting the potential risk of innovation implementation to companies.

Brown and Osborne (2013) further studied the relationship between risk and innovation. They particularly focused on how innovative approaches could assist risk management (Brown & Osborne, 2013). The authors positively linked innovation implementation, regarding new technology and processes, to improving and streamlining public sector processes and management, which was in line with findings by other authors (Altug & Van Ryzin, 2014; Brown & Osborne, 2013; Matta et al., 2014; Narayana et al., 2014; Schönsleben, 2016; Wagner & Neshat, 2012). They also found that innovations could assist companies in problem-solving and positive risk taking (Brown & Osborne, 2013).

Brown and Osborne (2013) noted, however, that the public sector often delayed implementation of innovation. These researchers further substantiated the importance of innovation risk management and responsible innovation; proving that companies were always to be vigilant with regard to how innovation was changing, and how innovation could help or hinder them (Brown & Osborne, 2013; Deptula & Knosala, 2015; Von Schomberg, 2013). While the current study is concerned with the private sector, where the companies delay innovation implementation less often, Brown and Osborne (2013)

worked to promote the positive impact and the risk of delaying innovation implementation.

Nanda and Rhodes-Kropf (2015) noted the need for, and implications of, financing innovation, much as Deptula and Knosala (2015) and Lam (2014) presented earlier. They noted that companies needed to find a balance between hedging their bets, by focusing their investments on less risky options, particularly in times of financial strain and uncertainty, as was experienced during the global financial crisis, and promoting investment into innovative avenues (Nanda & Rhodes-Kropf, 2015). They believed that very new technology needed deliberate funding to prove their worth (Nanda & Rhodes-Kropf, 2015). Sometimes, companies might need to make risky investments for innovation to pay off later down the line (Nanda & Rhodes-Kropf, 2015). These researchers highlighted the need for cost-reward and risk management analysis (Deptula & Knosala, 2015; Lam, 2014).

Krasteva et al. (2015) highlighted the importance of corporate support during and toward innovation. Corporate support was particularly relevant for innovation taking place within a company, and extended the general need for support that managers would require from their companies (Heckman et al., 2014; Hopkin, 2014; Kaplan & Mikes, 2012; Krasteva et al., 2015; MacDonald & Corsi, 2013; Revilla & Sáenz, 2014). Krasteva et al. (2015) believed that companies should support internal innovative ideas or creations, thereby prompting more employees to partake in practical problem-solving. They also pointed out that employees who partook in or suggested innovation should be allowed to lay claim to their ideas, as failure to do so would cause employees to partake

less in internal innovation projects, and possibly work on their ideas externally, which could lead to the company losing out on innovation opportunities (Krasteva et al., 2015). In terms of risk management, the authors believed that internal innovation and employee autonomy would likely pose less risk to a company, than making use of external innovations or forcing innovation out of their companies through obstructive policies (Krasteva et al., 2015; Linares-Navarro et al., 2014; Simba, 2013).

Similarly, Drucker (2015) dealt with the link between innovation and entrepreneurship and how new business models could assist in promoting innovations. The author asserted that social and political factors played a significant role in promoting innovation (Drucker, 2015). A freer economy could also assist in promoting entrepreneurship and innovation development (Drucker, 2015). Companies that attempted to create a freer environment, and broader social, political, and economic factors supported, were more likely to achieve innovation and lessen potential risks (Drucker, 2015). Such freedom would not be enough, however, without companies also focusing on sustainability (Pagell & Shevchenko, 2014). Current understandings and innovations around supply chain management—particularly around sustainability—are still relatively inadequate (Pagell & Shevchenko, 2014). For company supply chains to properly function into the future, managers will need to apply *forward thinking*, address problems in new and unique ways, and promote radical innovations, along with establishing the economic, social, and political freedoms (Drucker, 2015; Pagell & Shevchenko, 2014). I discussed the topic of sustainability in more detail later in another section, but it is important to note that supply chain disruption risk management is as much about

hindsight and looking to address and redress past issues as it is about attempting never-before-seen innovations. What this will look like is yet to be established. The study may provide a glimpse into current and potential future innovations and methods in the studied companies.

For a more specific example regarding innovative trends in the health care sector, Taniguchi, Thompson, and Yamada (2014) looked at how managing city logistics (and, by extension, the risks therein) in innovative ways could improve current models and approaches. Their study was of importance in understanding how city logistics and transportation impacted home health care delivery (Taniguchi et al., 2014). By extension, these researchers presented the idea that finding innovative ways of shipping product would lead to more streamlined and sustainable supply chain networks and would minimize risks involved in product transportation. Similarly, Putzer and Park (2012) gave another industry specific example around how new technology (particularly smartphones) could assist physicians and patients in various medical related problem-solving endeavors. They specifically noted that new technology could aid physicians in improving decision-making and clinical tasks (Putzer & Park, 2012). They believed that the better innovation was represented in such areas as compatibility, job relevance, and observability, and if innovation could improve the personal experience, the more likely it would benefit individuals and companies (Putzer & Park, 2012). In both studies, the researchers presented the practicality of innovation implementation and its effects on current operations, as established theoretically by other authors (Brown & Osborne, 2013; Krasteva et al., 2015; Nanda & Rhodes-Kropf, 2015).

Innovation plays an important role in the development, relevance, and sustainability of companies. Technological, managerial, and process innovations could improve flow, structure, and work experience, thereby improving company performance. While the discussion of innovation in this section did not often revolve around developments specifically within the supply chain disruption risk management area, it could clearly be determined that taking calculated risks with regard to innovation implementation and investment could assist in companies minimizing greater risks, streamlining processes, and adding value to their industries. Companies could extend these benefits to having similar outcomes within supply chains and supply chain disruption risk management.

Sustainability

For supply chains and risk management to be effective, they must be sustainable over time. Aziz et al. (2015) aimed to determine how various companies viewed and applied sustainable risk management. As with previous studies related to risk management, the authors established that governance (i.e., policies and practices) and managerial skills could significantly improve supply chain disruption risk management, thereby making supply chains more sustainable over time (Aziz et al., 2015; Hida, 2015; Lam, 2014). The authors believed that for management programs to be most effective and sustainable, companies had to approach them holistically, from a portfolio, stakeholder, and legitimacy standpoint (Aziz et al., 2015).

Companies often had to change both their beliefs and approaches to their current operations in relation to sustainability (Muduli, Govindan, Barve, Kannan, & Geng,

2013b). If managers, board members, employees, and other human resources could adjust their behavior and actively seek out ways of improving sustainability within their specific sphere of company operations, it was more likely for both sustainability and risk management to improve (Muduli et al., 2013b). Bradenburg, Govindan, Sarkis, and Seuring (2014) believed that more research and implementation of mathematical models for determining the environmental and social impact of supply chains could assist companies in creating sustainable chains (Bradenburg et al., 2014). Some of the models they suggested included analytical hierarchy processing, analytical network processing, and life-cycle analysis (Bradenburg et al., 2014). By providing practical and visual models for understanding supply chain management, it is likely that individuals acquire knowledge and be more willing to adapt to changes and sustainable implementations (Bradenburg et al., 2014; Muduli et al., 2013b).

Like Prajogo and Olhager (2012), Weiland and Wallenburg (2013) noted the need for human relations and interactions for successful risk management. Weiland and Wallenburg assessed how successful relationships between parties in a supply chain could assist in developing resilience and sustainability therein. They found that relational competency could improve both functioning's along the supply chain and end-user/customer relations (Weiland & Wallenburg, 2013). Better relationships created between supply chain operations would lead to better customer satisfaction, which would maintain or increase demand, thereby creating a sustainable supply chain (Weiland & Wallenburg, 2013). The authors also found that communication and cooperation along a supply chain aided in supply chains becoming more resilient against disruptions, thereby

minimizing risk and making them further sustainable (Weiland & Wallenburg, 2013).

Govindan, Soleimani, and Kannan (2015) indicated similar findings, asserting that supply chain management and sustainability were linked in terms of legal, environmental, and social factors (Govindan et al., 2015). Their literature review highlighted reverse logistics and closed-loop supply chain management and revealed that communication, forecasting methods, and modeling different approaches could lead to successful supply chain disruption risk management (Govindan et al., 2015).

Another factor related to supply chain sustainability related to a company's ability to successfully source required products, materials, and resources, as well as how flexible they were when dealing with delays or changes (Chiang, Kocabasoglu-Hillmer, & Suresh, 2012). Their study worked to substantiate claims regarding the need for company rigor and responsiveness as a way of navigating and mitigating disruption risk (Christopher, 2016; Ivanov et al., 2014; Revilla & Sáenz, 2014; Roh et al., 2013). Chiang et al. (2012) believed that strategic internal sourcing and flexibility could significantly improve supply chain processes and performance, and assist companies in better dealing with uncertainties and risk. It became clear that strategic planning, an awareness of social and environmental impact, communication, and relationships, all played a part in improving the sustainability of supply chains.

Environment as a sustainability factor. From the previously mentioned sources, it became clear that modern companies cannot discuss sustainability or remain sustainable without addressing environmental issues. This is particularly true for big brands (Dauvergne & Lister, 2012). Bigger companies often have a bigger impact on the

environment and use more natural resources, particularly in the manufacturing and industrial sectors (Chaabane, Ramudhin, & Paquet, 2012; Dauvergne & Lister, 2012). Furthermore, such companies need to prove environmental awareness to maintain customers and value perception, in order to continue their brand success (Dauvergne & Lister, 2012). This calls for companies to have communication and collaboration, both across their supply chains and with their customers (Chen et al., 2013; Christopher, 2016; Ramanathan & Gunasekaran, 2014; Roh et al., 2013). Dauvergne and Lister (2012) determined that big brands' sustainability, in relation to increased consumer awareness of brands' environmental impact, has caused a shift in power relations along global supply chains, which has caused improvements in the environmental sustainability of companies, particularly in relation to innovations in product development and production. These improvements tend to be mitigated by increased consumption, and the authors called for stricter government regulation around environmental sustainability, production, and consumption to ensure a balance between the three could be met, and thereby benefit companies, consumers, and the environment alike (Dauvergne & Lister, 2012).

Several researchers also addressed sustainability regarding environmental impact. The investigators noted that if companies, particularly in the industrial sector, could lessen their negative environmental impact along their supply chain, they would become more sustainable over time (Chaabane et al., 2012). These authors used a mixed-integer linear programming-based framework for supply chain life cycle assessment and noted that functions and better waste disposal methods, as well determining economic and environmental tradeoffs, could better ensure supply chain sustainability (Chaabane et al.,

2012). While the authors noted improved legislation around environmental issues related to industry, as with Dauvergne and Lister (2012), Chaabane et al. (2012) determined that more should be done to ensure better harmony between the two areas. Similarly, companies that adopted more green methods of supply chain management were likely to improve their general sustainability (Govindan, Azevedo, Carvalho, & Cruz-Machado, 2014; Luthra, Garg, & Haleem, 2014). Luthra et al. noted that a lack of natural resources would eventually force companies into adopting more environmentally sustainable practices and that the sooner companies adopted such methods, the more likely they would remain functional in the long run. This further established both the need for sustainable supply chains, and better management of current resources, in order for companies to operate effectively (Chaabane et al., 2012; Dauvergne & Lister, 2012; Govindan et al., 2014; Luthra et al., 2014).

Companies could make their supply chains more environmentally friendly and sustainable. Dues et al. (2013) posited that were companies to streamline supply chains—ridding the chains of excess and unrequired processes and practices, or replacing materials, products, or processes with more efficient and environmentally sustainable ones—their supply chains would run more effectively and efficiently, and would, therefore be more sustainable, both in means of operation and delivery, as well as environmentally. This notion was further asserted by Golicic and Smith (2013), who addressed different practices and implementations in creating greener and sustainable supply chains through their meta-analysis of the related literature. Like Dues et al. (2013), Golicic and Smith (2013) found that companies that approached sustainability

from environmental, market, operational, and accounting frameworks were more likely to improve supply chain sustainability. They also determined that the structure of a company and supply chains (i.e., upstream, downstream, or close-loop), as well as the larger industry, company size, and area of operation also impacted on the level of sustainable success, which further corroborated other research findings (Amin & Zhang, 2013; Golicic & Smith, 2013; Govindan et al., 2015; Qiang et al., 2013; Snyder et al., 2016; Wagner & Neshat, 2012). Environmental supply chain sustainability is dependent on management, decision-making, industry awareness, and changes and streamlining of processes and policies.

There are numerous barriers to such environmental and sustainable changes (Muduli, Govindan, Barve, & Geng, 2013a). This is particularly true for industries that rely heavily on depleting natural resources, such as the mining sector (Govindan et al., 2014; Muduli et al., 2013a, 2013b). When an important commodity within a supply chain is scarce, yet necessary for the functioning of both the supply chain and the company at large, managers need to find innovative ways of using, maintaining, distributing, and processing such commodities (Muduli et al., 2013a; 2013b). This can cause extra stress on both managers themselves and the supply chain, thereby increasing potential disruption risks. While companies may wish to align company goals with environmental and governmental demands, how to do so might be difficult (Dües et al., 2013; Golicic & Smith, 2013; Muduli et al., 2013b). I partially explored the various means, which requires further future research.

Assessment. Another means of ensuring sustainability would be to assess management approaches accurately. While the subject of management assessment has already been dealt with earlier in the section, assessments, as they relate to sustainability, will be the main focus in this section. In particular, I present research on the Life Cycle Assessment (LCA) and failure mode as stated by (Hellweg & Canals, 2014; Liu, Liu, & Liu, 2013) as well as effects analysis (FMEA) perspectives. I also highlighted other assessment methods.

Current trends, approaches, difficulties, and means of assessment for and during chains' life cycles are important for managers to consider. To that end, LCA could be used to adequately determine the production, use, and disposal of goods within a supply chain life cycle (Hellweg & Canals, 2014). This assessment tool's function also aligns with managers' need to proactively and creatively manage resources within supply chains (Govindan et al., 2014; Muduli et al., 2013a, 2013b).

LCA could assist companies in identifying and bettering supply chains without shifting burdens from one area of a supply chain to another, or increasing risk due to implementing changes (Hellweg & Canals, 2014; Park et al., 2012; Roh et al., 2013). This assessment method could also be used to assess supply chains in relation to environmental issues, policies, products, and consumers (Hellweg & Canales, 2014). Making relevant changes according to such assessment could also promote sustainability within supply chains (Dionne, 2013; Hellweg & Canals, 2014; Hida, 2015; Wagner & Neshat, 2012). Hellweg and Canals (2014) cautioned against the LCA tool's tendency to rely on simplifications, and called for a more holistic approach to supply chain

assessment to better cater for uncertainties and potential risks that a company may overlook in initial assessments.

LCA could also assist managers in not only assessing their company's environmental impact, but also allow them to determine their continued *company viability* (Del Borghi, Gallo, Strazza, & Del Borghi, 2014). The study of Del Borghi et al. (2014) was particularly helpful to the current study in providing practical means of improving packaging systems within supply chains, according to assessment results and industry needs. These authors believed that reducing the weight of packaged products and choosing different, more environmentally friendly packaging materials could improve supply chain sustainability (Del Borghi et al., 2014). The authors' study also provided substantiating information on how and why assessment and industry-specific adjustments were vital to the sustainability of supply chains (Del Borghi et al., 2014; Ellul & Yerramilli, 2013; Samvedi et al., 2013).

Similarly, FMEA could be used to successfully mitigate potential system, process, and design risks and failures in different industries (Liu et al., 2013). Liu et al. asserted that the more traditional risk priority number (RPI) assessment tool lacked some of the necessary risk models to adequately assess risk and risk prevention strategies in the same way that FMEA could. As with all assessments and implementations, managers would ultimately have to decide which would work best for their own companies and supply chains (Del Borghi et al., 2014; Rushton et al., 2014; Wisner et al., 2016). While the Liu et al. (2013) study focused on assessing risk in general, the authors presented an alternative to the LCA tool and provided evidence that choosing the correct and best

assessment tool would benefit managers in better managing risk, which would lead to stronger, more sustainable practices, particularly in relation to supply chain disruption risk management (Del Borghi et al., 2014; Hellweg & Canales, 2014; Rushton et al., 2014; Wisner et al., 2016).

Assessing the policies, practices, and outcomes of supply chain management regarding economic, environmental, and social impact could aid companies in making better changes and decisions toward sustainability (Aziz et al., 2015; Beske et al., 2014; Drucker, 2015; Hammoudeh et al., 2013; Hida, 2015; Lam, 2014; Rigby & Bilodeau, 2015). Beske et al. (2014) conducted an analysis of the current studies about supply chain management. Beske et al. also substantiated that better, more sustainable practices would allow companies to maintain closer control over their supply chains, which would improve their competitiveness and sustainability within their industry (Altug & Van Ryzin, 2014; Ivanov et al., 2014; Schönsleben, 2016).

Assessing supply chain sustainability in terms of responsiveness also appears to be useful for managers. It is important for managers to assess company and supply chain management in relation to their dynamic capabilities and how flexibility, knowledge-sharing, and adaptations to supply chains could better supply chain management and sustainability (Beske et al., 2014; Chiang et al., 2012; Christopher, 2016; Ivanov et al., 2014; Revilla & Sáenz, 2014; Roh et al., 2013). Tracing and tracking (i.e., further assessment) of products and production to ensure customer satisfaction was also important (Beske et al., 2014).

There is a need for companies to take customer relations into account as a means of ensuring successful and sustainable supply chains (Beske et al., 2014; Dauvergne & Lister, 2012; Wisner et al., 2016). These authors also called for more research into practical operationalization, or examples of how such methods and assessments performed in real-life supply chains (Beske et al., 2014). This call further substantiated related calls and established the need for the current study (Beske et al., 2014; Narayana et al., 2014).

It is not enough for managers to be aware of different sustainability and risk assessment methods and/or tools. They also need to comprehend the value of each to gain the most from the assessment process (Estampe, Lamouri, Paris, & Brahim-Djelloul, 2013). Estampe et al. posited that because supply chain management could lend value to companies, customers, and stakeholders, it is of the utmost importance to ensure assessment and measurement of supply chain practices and strategies (Estampe et al., 2013). While several assessment tools and models exist (Beske et al., 2014; Del Borghi et al., 2014; Hellweg & Canales, 2014; Liu et al., 2013), it is always best for individual companies to use and adapt such tools to suit their contexts and needs (Del Borghi et al., 2014; Estampe et al., 2013; Rushton et al., 2014; Wisner et al., 2016). Estampe et al. (2013) also asserted that assessments could influence and be influenced by such factors as company organization, distribution or hierarchy of responsibility, and the level of supply chain maturity. These authors substantiated the idea that sustainability and assessment work hand-in-hand, and that using the findings of assessments managers

could improve and strengthen supply chains (Del Borghi et al., 2014; Estampe et al., 2013; Rushton et al., 2014; Wisner et al., 2016).

Sustainability is an important part of the supply chain disruption risk management process. If companies cannot effectively determine which practices and policies are best for their supply chain, it is likely that their chain will fail or lack competitive viability. Sustainability and resilience within a supply chain are intricately linked with environmental, social, and economic issues; thus, companies, as well as governments, should maintain that balance between these factors. Companies need to maintain customer relations, as well as inter-business and supply chain relationships, so as to ensure their continued demand, operation, and sustainability.

Transition

In this review, I discussed factors such as what constituted supply chain, disruption, and risk management; how innovation and sustainability relate to this process; and various means of approaching management in detail in this review. From the reviewed literature, I discovered that supply chain managers require skills, healthy inter-company and interpersonal relationships, as well as company and legislative support to ensure efficient and effective supply chain performance and risk management (Chaabane et al., 2012; Dauvergne & Lister, 2012; Heckman et al., 2014; Hida, 2015; Hopkin, 2014; Kaplan & Mikes, 2012; MacDonald & Corsi, 2013; Revilla & Sáenz, 2014). Of note was the importance of CRO autonomy and risk management training as a means of ensuring successful supply chain disruption risk management (Hida, 2015; Hill et al., 2014; Linares-Navarro et al., 2014; Marcelino-Sádaba et al., 2014; Simba, 2013).

I also discussed the importance of adequate insurance, industry awareness, and decision-making. There was a clear dearth in the research regarding practical implementation, solutions, techniques and/or processes regarding risk management, especially within the personal care industry. While personal management capabilities and general industry policies were prevalent within the literature, I found little information regarding (a) how managers practically approach and manage risk within their supply chains, and (b) what policies and procedures the personal care industry, specifically, could put in place to assist with managing industry-specific supply chain risk. In the study, I provided such needed practical application and procedures through a multiple case study approach.

The section also included sources that provided clarity on how companies could improve their profitability through management. Of particular note in this area was how companies could implement or develop innovative ideas and tools for streamlining supply chain processes, bettering management techniques, and promoting employee participation in problem-solving (Altug & Van Ryzin, 2014; Deptula & Knosala, 2015; Drucker, 2015; Matta et al., 2014; Narayana et al., 2014; Rushton et al., 2014; Schönsleben, 2016; Wagner & Neshat, 2012; Wisner et al., 2016). Furthermore, companies that employed environmentally aware policies and processes were more likely to strengthen supply chains and improve their sustainability.

While some sources noted how changes to supply chains could negatively impact on initial profits and potential risk, most authors determined that correct changes at the right time could significantly improve profits in the long run, and often mitigate risks far

more effectively than avoiding such changes (Matta et al., 2014; Park et al., 2012; Rigby & Bilodeau, 2015; Roh et al., 2013; Rushton et al., 2014; Wisner et al., 2016). Most sources also established that addressing supply chain disruption risk management and assessment thereof from a holistic viewpoint would benefit companies and ensure that they put the correct techniques, processes, and policies in place (Janvier-James, 2012; Lam, 2014; Rushton et al., 2014; Samvedi et al., 2013; Schmitt & Singh, 2012; Snyder et al., 2016; Wisner et al., 2016). In the study, I worked to further establish the value of such assertions by providing practical examples of how innovation, sustainability, and a holistic approach work to improve supply chain disruption risk management within companies. Overall, I aimed to provide information on how companies could develop effective supply chain management approaches and minimize supply chain disruption risks. While the information provided did not necessarily relate directly to the personal care supply chain, much of it could be adapted to suit that industry.

A discussion on the general problem and goal of the study, regarding how best to improve Fortune 500 companies' profits by finding practical ways of mitigating supply chain disruption risk is contained in this section. The section also included a discussion around the assumptions, limitations, and delimitations involved in conducting this particular study. Additionally, Section 1 included a discussion on the background and significance of the study, noting that companies could benefit from this research by learning from the tried and tested methods implemented by the managers in the case study.

In Section 2, I provide discussion of the research methodology and design of the study. In the next section, I present a justification for the chosen multiple case study approach and provide reasoning as to why other designs and data collection methods would not be as fitting. Section 2 includes a description of and reasoning for the chosen participants, sample size, recruitment procedures, and data collection and analysis. Section 3 includes an overview and presentation of findings from the analysis of the study.

Section 2: The Project

This section includes a more in-depth discussion of the research design and method that was used for the study. In this section, I also discuss my role as the researcher, the population and sample, and the data collection and analysis procedures. I conclude the section with steps on how I ensured confidentiality, validity, and reliability of the findings throughout the study.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies personal care business supply chain managers use to mitigate supply chain disruption risk. The population included nine supply chain managers from five Fortune 500 CPG personal care companies in the northeastern United States who have successfully used strategies to mitigate supply chain disruptions. Supply chain managers determine and implement strategies to mitigate any supply chain disruptions and therefore were the most appropriate population for the study. The results of this study can create social change by providing information on better management of company assets, which can enable more effective use of resources while reducing costs for business and consumers. Reduced costs can result in more resources being available to consumers for increase to their standard of living and provide other benefits.

Role of the Researcher

The role of the researcher is important throughout every aspect of the research process from designing the study, conducting interviews, coding, analysis, and verifying and reporting concepts and themes (Fink, 2000; Ormston, Spencer, Barnard, & Snape,

2014). The study was about supply chain, disruption, and risk management. Though my job is not in supply chain management, I am knowledgeable in the importance of a supply chain in the context of my organization and the business industry.

Prior to and during the study, I followed the ethical principles and guidelines for research involving human subjects as provided by the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). To minimize the potential effects of familiarity on the results of the interview, I only recruited participants who I did not know personally. If the researcher does not personally know the participants, personal biases are less likely to occur (Fusch & Ness, 2015; Ormston et al., 2014).

During the study, I treated participants with respect as autonomous agents and as people entitled to protection. I provided the participants with the full details of the study and a description of their role as voluntary participants. I made the participants aware that no risk would arise from answering interview questions, in accordance with the Belmont Report's emphasis on beneficence—that researchers must not do harm to their study participants (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). The interview questions were clear so that participants did not have difficulty understanding them (Fusch & Ness, 2015; Ormston et al., 2014; Rossman & Rallis, 2003). I adjusted the interview questioning based on the participants' language, rationality, and maturity. Participants answered the interview questions as freely as possible (Fusch & Ness, 2015; Ormston et al., 2014; Rossman & Rallis, 2003), and I did not repudiate or interrupt their responses. To minimize bias, I noted my

perceptions, interpretations, and expectations of findings in a journal. This enabled me to be aware of my personal biases regarding the topic; in this way, my biases did not cloud my interpretation of the interview data, and I ensured objectivity during the data collection process.

The interview protocol (see Appendix) ensured that there were steps before, during, and after the interview. I followed the interview guide to ensure the credibility of the data collected. The interview protocol was used as a guide so that the interview process was conducted with a focus on a topic (see Fusch & Ness, 2015). The main advantage of using an interview protocol is to maximize the limited time during the interviews (Patton, 2015).

Participants

Participants in this study included supply chain managers of Fortune 500 personal care companies in the northeastern United States. Criterion for participant selection was that each supply chain manager had more than 10 years of experience in their field. I used a purposive sampling method for this study, which refers to strategic choices about with whom, where, and how one performs research; the sample must be tied to the research objectives (Givens, 2008). Based on the objectives or purpose of this study, I selected an intended sample from five national personal care companies to participate in the study.

I recruited the participants via e-mail. This e-mail included the purpose of the study, inclusion criteria, and the role of participants, as well as my contact information. To those who responded to the e-mail and met the inclusion criteria, I e-mailed an

informed consent form to review, sign, and send back. In this second e-mail, I also sent the interview questions to each participant.

The development of trust is crucial in establishing a researcher–participant working relationship (Rossman & Rallis, 2003). One of the ways to develop a trusting relationship with the participant is to send the informed consent form and answer any questions they have about the study. Another way to develop a relationship with the participants is to assure them that their answers will remain confidential. During the interview process, I debriefed the participants on the objectives of the study, how I would use the data, and how participants could withdraw from the study at any time. Debriefing enabled a trusting relationship with participants to develop (see Givens, 2008). In addition, participants could review the interview protocol and ask questions. To preserve confidentiality in the study, I used codes rather than participants’ names to label, store, and present interview responses.

Research Method and Design

The purpose of this qualitative multiple case study was to explore the strategies that personal care business supply chain managers use to mitigate the phenomenon of supply chain disruption risk. To fulfill the purpose of this research, a qualitative multiple case study was the appropriate method and design to obtain information to address the overarching research questions. The next sections include descriptions of the method and design.

Research Method

Qualitative case studies involve the exploration of the meaning of participants' experiences (McCusker & Gunaydin, 2015). Qualitative researchers try to answer research questions by interacting with participants who have experienced the phenomenon under study (Givens, 2008). Qualitative researchers use inductive inquiry to obtain insights grounded in collected data (McCusker & Gunaydin, 2015). Qualitative research also allows practitioners to identify the fundamentals of all the choices, approaches, viewpoints, and logics of their target audience (Corley, 2011). Researchers use the qualitative methodology when key elements of phenomena are unknown (Givens, 2008; Yin, 2013), which fit this study regarding strategies that personal care business supply chain managers use to mitigate the phenomenon of supply chain disruption risk.

In contrast, quantitative researchers conduct deductive examination of clearly defined variables (Frels & Onwuegbuzie, 2013) to find the relationships and differences among variables (Givens, 2008; McCusker & Gunaydin, 2015). I did not use the quantitative method, because I explored experiences to address the business problem. Similarly, the mixed method approach involves the collection of quantitative and qualitative data of clearly defined variables (Plano Clark & Ivankova, 2015). In mixed methods research, the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative data in a single study (Givens, 2008). The study did not include any variables, and only qualitative data collection met the purpose of the study; thus, a mixed method approach was not appropriate. I used the qualitative method because of the flexibility of qualitative research, which allowed me to

gather data from the interviewees regarding strategies to mitigate supply chain disruption risks and disruptions.

Research Design

Central qualitative designs include (a) case study, (b) grounded theory, (c) narrative research, and (d) phenomenology (Naidu & Patel, 2013). The grounded theory researcher begins the research process by collecting the participants' perspectives of a phenomenon without the guidance of a specific theoretical or conceptual framework (Reiter, Stewart, & Bruce, 2011). The grounded theory method consists of a set of systematic but flexible guidelines for conducting inductive qualitative inquiry aimed toward theory construction (Givens, 2008; Rossman & Rallis, 2003). Grounded theory was not applicable to this study because the research did not result in a new theory. Narrative design requires a lengthy observation of personal experiences (Givens, 2008; Whiffin, Bailey, Ellis-Hill, & Jarrett, 2014); therefore, it was not chosen for this study. Researchers use ethnography to focus on the customs of people and cultural groups (LeCompte & Schensul, 2013; Rossman & Rallis, 2003), which was not my intent in this study. Phenomenological studies involve the development of thick and rich descriptions through an understanding of participants' lived experiences (Moustakas, 1994; Rossman & Rallis, 2003), which was not the focus of this study. A case study design was chosen because case study researchers use multiple types of data to create explanations of phenomena such as business problems (Yin, 2013). Thus, I used a qualitative case study to understand the phenomenon concerning supply chain disruption risks.

When studying contemporary events in which there is little to no control and the boundaries between context and phenomenon are unclear, a case study is the preferred research method (Yin, 2013). The issue of supply chain disruption risks is a real-life issue within businesses in which the boundaries and context in which they occur are unclear. The use of the multiple case study design allows comparisons of similarities and differences between cases or units. The unit of analysis of the present study was the perceptions of supply chain managers from each of the participating Fortune 500 personal care companies located in the northeastern United States regarding strategies implemented to mitigate supply chain disruption risks.

An effective qualitative case study requires data saturation (Yin, 2013). Data saturation occurs when the interviewer finds no new significant insights (Givens, 2008). Data saturation occurs through various methods in qualitative research, including interviews (Yin, 2013). Repetitive answers and themes from multiple participants are a signal that no new insights will emerge (Lincoln & Guba, 2013). Researchers may validate data saturation through interviews and member checking in qualitative case studies (Lincoln & Guba, 2013).

Data saturation was achieved in the interviews when there was no new information gathered from the participants. For the study, data saturation occurred when the interviews results did not provide new responses. I conducted interviews until no new themes and no further insights were gained from at least nine individuals to ensure data saturation. If I was unable to achieve data saturation after interviewing all participants, I

would have recruited more participants. I also used member checking to assure data trustworthiness.

Population and Sampling

The purpose of this qualitative multiple case study was to explore the strategies that personal care business supply chain managers use to mitigate the phenomenon of supply chain disruption risk. Personal care companies focus their production on personal and healthcare products. Personal care companies also have supply chain processes as they develop and sell their products.

I used a purposeful sampling method to identify potential participants for the study. Purposeful, or purposive, sampling refers to strategically locating participants, places, or situations that have the largest potential for advancing understanding (Givens, 2008). I recruited and selected participants from national personal care companies. I selected an intended sample size of nine supply chain managers from across the five companies to participate in the study based on the criteria that each has had over 10 years of experience in the industry.

Using a small sample size is a characteristic of qualitative research (Givens, 2008; Rossman & Rallis, 2003; Yin, 2013). Additionally, a sample that is cohesive (i.e., if all participants are members of a group) allows a quick achievement of data saturation (Givens, 2008). Data saturation occurs if there is no new information collected from the remaining participant (Gilgor, Esmark, & Golgeci, 2016). To achieve data saturation, I would have continued interviewing, past the nine interviews if necessary, until no new information emerged.

Ethical Research

To ensure the conduction of ethical research, I implemented ethical practices prior to and throughout the duration of the study, as outlined in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). For example, I obtained IRB approval before commencing data collection. After getting the Walden University IRB approval (05-09-18-0427315), I obtained participants' consent prior to conducting the interviews. Consent from the participants is crucial to the credibility and validity of the results (Givens, 2008). I used a consent form and informed participants of the purpose of the study, the procedures and their role as a participant, the anticipated time commitment, and my contact details if any questions arose about the study.

The participation of the individuals was voluntary. I informed the participants that they were free to withdraw from the study at any time, with no repercussions. Withdrawing from the study is a right of every participant (Rossman & Rallis, 2003). I provided the participants with my contact information to either call or e-mail me to inform me of their choosing to opt out of the study. Only individuals who were willing to participate were part of the study. Participants who signed the consent form indicated that they read and understood the explanation of the study and agreed that their participation is voluntary and felt assured of the coding system used to ensure confidentiality.

To maintain confidentiality during response collection, codes were useful (see Givens, 2008; Rossman & Rallis, 2003). I created codes for each participant such as P01. All interview notes from interviews will include these codes. Using alphanumeric codes

protected the participants' identity throughout the study. I will store interview data and notes in a locked and secured a location for 5 years after the publication of this study. Afterwards, I will destroy both hard and soft copies.

Data Collection Instruments

The primary data collection instrument is the researcher (Yin, 2013), meaning that I was the tool for collecting information for this qualitative multiple case study. As the researcher, I interpreted the data collected from the interviews, which gave meaning to the patterns. A secondary data collection instrument was the interview questions (see Appendix). Interviews are an effective technique for addressing the research questions of a case study (Givens, 2003; Yin, 2013). The main benefit of the interview format is that it facilitates communication between the interviewer and the interviewee, which allows the interviewer to pay attention to the topics and concerns of the goal and not digress (Rossman & Rallis, 2003; Yin, 2013). Furthermore, interviews allow the interviewer to get more familiar with the history and life of the interviewee to make deductions about interviewee responses—something that other forms rarely achieve (Yin, 2013).

I used a semistructured interview protocol (see Appendix) for participant interviews. Semistructured interviews allow the reality to surface, along with the opinions of those affected by it (Yin, 2013). It is appropriate to use semistructured interviews if researchers know enough of the topic to frame the needed discussion in advance (Qu & Dumay, 2011). Semistructured interviews include a series of open-ended questions based on the topic areas to cover (Qu & Dumay, 2011). Open-ended questions define the topic under investigation but allow the interviewers and interviewees to talk about some of the

topics in more detail (Qu & Dumay, 2011). I developed the interview questions based on existing literature on supply chain disruption risk. I aligned the open-ended questions to the research question of the study to assist in determining what strategies supply chain managers of personal care companies consider best in mitigating supply chain disruption risk. I asked probing questions (see Appendix) to gain an in-depth understanding of participants' perceptions on effective strategies toward supply chain disruption risk, specifically those in personal care companies. The interview protocol served as a guide during the semistructured interviews with the participants (Givens, 2008; Rossman & Rallis, 2003).

I conducted member checking review of interview responses which ensured the reliability and validity of data collected. I informed the participants that I allow them to add any further details or explanations to their responses if desired. I then interpreted responses for of the participant answers, after which participants were asked again to review accuracy of interpretation. I adjusted any inaccuracies accordingly.

A secondary data source includes archival documents. Archival documents collected include policies, procedures, and manuals related to supply chain disruption risk management. Such organizational documents provide support to interview responses (Givens, 2008; Yin, 2013). The purpose of collecting documents related to supply chain disruptions is to gain an understanding of how supply chain managers successfully handle, or intend to handle, supply chain disruptions.

Data Collection Technique

Prior to conducting interviews, I asked participants to sign an informed consent

form. The informed consent form includes details of study procedures and their role as a voluntary participant. I informed participants that they could withdraw from the study at any time with no repercussions. I collected informed consent forms at the time of the interview. Any archival documents not accessed during participant interviews would have been requested from participants' managers.

The primary source for collecting data is the researcher (Yin, 2013). I collected data through the form of semistructured interviews. Advantages and disadvantages exist in using interviews as a data collection method. The interview facilitates communication between the interviewer and the interviewee, which as a result allows the interviewer to pay the highest attention to the topics and concerns of the goal and not digress (Rossman & Rallis, 2003; Yin, 2013). Furthermore, the interviews allow the interviewer to get more in tune or familiar with the history and life of the interviewee (Yin, 2013). Doody and Noonan (2013) provided several disadvantages of using interviews. First, interviews may seem intrusive to participants (Doody & Noona, 2013). Second, interviews are time-consuming since it takes time to prepare and conduct them (Doody & Noona, 2013). Lastly, interviews are susceptible to bias (Doody & Noona, 2013). For instance, the participant had the desire to please the researcher.

Interviews were conducted via e-mail. To ensure interviews were conducted as intended, I conducted member checking. A secondary data source was archival documents (Givens, 2008; Yin, 2013). These included policies, manuals, and other organizational documents related to supply chain risk management. Archival documents are text-based files as well as photographs, charts, and other visual materials (Givens,

2008; Yin, 2013). Documents constitute the basis for most qualitative research (Givens, 2008; Yin, 2013). Through documents, a connection between contents and practical action, and sites of action can be made (Givens, 2008). Organizational documents will provide support to interview responses (Givens, 2008; Yin, 2013), detailing specific procedures and policies related to supply chain risk management. The purpose of collecting documents related to supply chain disruptions was to gain an understanding of how supply chain managers successfully handle, or intend to handle, supply chain disruptions. Advantages and disadvantages exist when using archival documents. Some advantages include getting information during the time of the situation when no other data collection instrument is available such as interviews and convenience as the data is already collated (Donaldson, 2013). The main disadvantage is the credibility and accuracy of the information in these documents (Donaldson, 2013). After the interviews were completed, the participants were informed to expect an e-mail within five weeks from the interview for the process of member checking. Member checking is the process of utilizing the help of the participants in reviewing the emerging themes and confirming the results to enhance the credibility of the findings (Morse et al., 2008). I e-mailed the results of the data analysis, sent a preliminary copy of the study findings, and scheduled follow-up interviews with the participants to confirm I accurately recorded, understood the context of the information they shared, and interpreted the experiences and perceptions in a way that reflects the organizational situations. After all data collection was complete, I informed the participants to expect an e-mail containing a copy of the completed study upon completion and approval from the University.

Data Organization Technique

Based on the information provided by (Givens, 2003; Rossman & Rallis, 2003; Yin, 2013), I matched any notes taken from the interview responses related to the topic of supply chain disruption risk with the respective participant's answers. Responses were then member checked with respective participants.

I organized and stored all data—including interview responses, notes, and organizational documents—in a database. I also organized responses and notes by pseudonym, date of collection, the location of collection, and notes. I then prepared and saved the responses as a stand-alone document, labeled only by participant codes. The use of alphanumeric codes for each participant will ensure the protection of participants' identities throughout the study (Givens, 2008; Lincoln & Guba, 2013; Rossman & Rallis, 2003). I stored all data in a locked and secure location for 5 years, after which I will permanently destroy the data.

Data Analysis

I conducted a thematic analysis of individual interview data, notes collected from the interviews with the supply chain managers, and organizational documents. Prior to analysis, I asked the participants to review their interview responses and the notes taken during the interview, ensuring the participants review their responses to more reliable result.

Once participants confirmed their respective responses, I uploaded the data into Nvivo 11 data analysis software. This software helped me to organize the data into categories for subsequent coding and thematic analysis. I first reviewed the interview

responses collected from each participant to learn about the strategies considered and implemented to mitigate supply chain disruption risks within Fortune 500 personal care companies. The codes came from the words and phrases of the participants (Rossman & Rallis, 2003). Using recurring words and phrases, I was able to generate codes that fit into emergent themes.

I coded participants' words and phrases into descriptive categories derived from themes related to supply chains, strategies, management, and disruption risks, all of which are important aspects of the study. I used categories associated with the conceptual framework of corporate risk management, of which guided this study, to organize data and generate themes. I then analyzed notes of respective interviews for reoccurring behaviors and expressions demonstrated during interviews that can support participants' interview responses. I conducted analysis of organizational documents similarly.

I conducted an analysis of interview data, until data saturation had occurred. Data saturation is the point when no new or relevant information emerges with respect to the research questions; it is the point at which no more data needs to be collected (Givens, 2008). If, after analysis of the interview data, saturation had not occurred, I would have conducted follow-up interviews if needed. Follow-up interviews would have provided an opportunity to ask probing questions to ensure no new information exists. Once data saturation had occurred, data was presented simultaneously by each case. Findings from the study will provide insight toward decreasing supply chain disruption risks and therefore more effective utilization of resources for personal care companies.

Reliability and Validity

To ensure the reliability and validity of the research, I implemented several measures. The following section included a discussion of methods selected to ensure dependability, transferability, credibility, and confirmability. Ensuring reliability and validity was crucial for the research study.

Reliability

To ensure the reliability of study findings means to ensure dependability of study findings (Givens, 2008; Lincoln & Guba, 2013). I protected the dependability of data throughout the study. Dependability refers to how coherent the processes are and how the researcher will manage changing conditions in phenomena (Bradley, 1993). To ensure dependability, the study included member checking. Member checking is the process of utilizing the help of the participants during the analysis phase (Morse et al., 2008). After I completed the initial results of the analysis, I asked the participants to review the preliminary findings. I e-mailed each participant a summary of the findings after receiving the approval of the study.

Validity

Validity refers to the credibility, confirmability, and transferability of the study. Credibility refers to the adequate representation of study constructs (Bradley, 1993). To improve the credibility of results, researchers engage in various methods such as prolonged engagement in the field, consistent observation, and triangulation; validating interpretations against raw data, peer debriefing, and member checking (Lincoln & Guba, 2013). For the study, I used methods of validating interpretations, peer debriefing, and

member checking. Prior to the study, I conducted peer debriefing with supervising faculty to discuss study procedures—the intent of which was to gain informed feedback on aspects of the study and to resolve any methodological issues. Analysis and interpretation of data can be discussed through peer debriefing either after the data analysis and interpretations have been made or as the data analysis and/or interpretations evolve to obtain trustworthy findings (Givens, 2008). Through peer debriefing, the researcher attempts to keep her or his bias out of the study (Givens, 2008). I also employed validation of data interpretations through member checking. This process utilized the help of the participants during the analysis phase (Morse et al., 2008). After I completed the initial results of the analysis, I asked the participants to review the preliminary findings. The combination of these data collection methods ensured credibility of the study findings.

To ensure validity, I achieved data saturation. Data saturation is the point when participants' responses reveal no new information or insight and when a researcher does not need to collect more data (Chenail, 2012). Without data saturation, findings may be weak or incomplete (Lincoln & Guba, 2013). I achieved data saturation through thorough analysis of interview data, follow-up interviews if necessary, and member checking. The use of member checking did not only ensure that no new findings existed, or that data saturation had occurred, but also the confirmability of interpretations of data collected. Confirmability of interview refers to how well others can confirm the characteristics of data, especially those who will look at the findings (Bradley, 1993).

Transferability refers to the extent to which researchers can use the findings in another context (Givens, 2008; Lincoln & Guba, 2013). Transferability refers to the degree to which the results of qualitative research are transferable into another context of the setting (Givens, 2008; Lincoln & Guba, 2013)—for instance, another industry where supply chain disruption risks occur. To enhance transferability, researchers should thoroughly describe the research context and the research assumptions (Lincoln & Guba, 2013). Others who wish to transfer the results to a different context will judge how sensible the transfer is (Lincoln & Guba, 2013). From interview responses, notes taken during interviews, and organizational documents, I created a rich and elaborate description as a foundation for others to refer to when comparing themes of the identified phenomena.

Transition and Summary

In Section 2, I included a detailed explanation of the methodology, a qualitative multiple case study, of the study. The purpose of this qualitative multiple case study was to explore the strategies that personal care business supply chain managers may use to mitigate the phenomenon of supply chain disruption risk. I recruited a purposeful sample of nine Fortune 500 Personal Care Company supply chain managers with at least 10 years of experience and located in the northeastern United States for the study. I performed semistructured interviews and analyzed organizational documents to collect data from participating supply chain managers. I analyzed the data collected from each participant as a single case, or unit of analysis, to learn of strategies perceived to mitigate supply chain disruption risks within personal care companies. I compared the themes that

emerged from each case between all cases or participants to determine the similarities and differences of strategies successfully implemented toward decreasing supply chain disruption risks. The results of this study may provide businesses with important information for ensuring efficient management of resources and improvement of the supply chain process. In Section 3, I will discuss the overview of the study, a detailed presentation of the findings, and recommendations on successful implementation of strategies toward supply chain disruption risks among supply chain managers.

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 personal care business supply chain managers use to mitigate supply chain disruption risk. The population included nine supply chain managers from five Fortune 500 CPG personal care companies in the northeastern United States who have successfully used strategies to mitigate supply chain disruptions. This study was conducted to create a social change by providing information that can lead to more efficient management of company assets, which can enable more effective use of resources and reduce costs for business and consumers. A reduction of production costs can result in more resources being available to consumers that can improve standard of living.

Using thematic analysis, I categorized the parent nodes as the source of thematic categories of the study. In the process of the analysis, I identified two themes that answered the strategies personal care supply chain managers use to mitigate supply chain disruption risk: (a) identifying qualified alternative suppliers and (b) having top management support. Detailed discussion of the findings in relation to the research questions of the study are contained in this section. The application of the findings to professional practice, recommendations for actions and future research, my reflection as the research journey, and the study conclusions are also in this section.

Presentation of the Findings

My interest in this qualitative multiple case study was to answer the research question: What strategies do personal care supply chain managers use to mitigate supply

chain disruption risk? To answer the question, I conducted thematic analysis and identified two themes: (a) identifying qualified alternative supplier is a common strategy in supply chain disruption mitigation plans, and (b) business top management support is essential in the execution of supply chain disruption plans and strategies. This section presents how these themes emerged in the analysis and how these findings confirm, disconfirm, and extend knowledge in the discipline.

Theme 1

Theme 1 emerged from the collection of participants' responses to interview questions. Six participants directly mentioned qualification and identification of alternative supply networks in the company's supply chain disruption plans. Participant 01 mentioned, "Qualify additional suppliers, identify suitable subs that can be brought in on short notice." This was also mentioned by Participant 03, who stated that the company should have disaster recovery planning that includes the "secondary supply qualification." Identification of alternative suppliers is the most basic strategy in supply chain management, as noted by Zsidisin and Ellram (2003). However, only few companies have adopted this strategy due to cost and level of efficiency (Chopra & Sodhi, 2014).

In the current study, the participants expressed diversification of supply base as part of the strategy for a sustainable supply chain. Participant 05 mentioned the phrase "diversify the supply base" and "strengthen the core supply chain." Similarly, Participant 06 said that it is important that the company should have policies in the diversification of the supply base to tap material crossing and monitor supply disruption. Participant 07

used the term *supplier segmentation* to describe the strategy they use to proactively respond to supply chain disruptions. Although diversification of supply base may be possible at the theoretical level given the right balance of the risk factors, the risks of this operation are still high (Mena et al., 2013). This is one of the reasons for exploring multi-tier supply chain management (Clark, 2015; Mena et al, 2013), which involves supplier network and multi-level suppliers to serve as alternative suppliers (Mena et al., 2013).

Identification of alternative suppliers is also consistent to findings from several studies of supply chain disruptions. For example, Chopra and Sodhi (2014) and Park, Hong, and Roh (2013) listed increasing inventory, adding capacity at different locations, and having multiple suppliers worked to an extent as traditional strategies that were effective in reducing the risk of supply chain disruptions. Though these types of strategies may be less efficient and costly in normal operations, they assure the continuous supply of materials required in the production of most companies. The participants' acknowledgement of the weakness and strength of a potential strategy is also consistent with Dionne's (2013) corporate risk management framework, where executives balance off the corporate investments and priorities with potential gains.

Theme 1 was articulated as the primary strategy among all other strategies identified by the participants that include (a) proactive identification and planning of supplier and potential risk exposure, (b) formation of supply chain disruption teams, (c) use of supply chain management software, (d) strengthening of supply chain network, and (e) disaster recovery planning. These strategies were mentioned by one or two

participants and were significant enough to be considered with thematic elements. Table 1 shows the summary of the strategies articulated by the study participants.

Table 1

Theme 1 Based on Strategies from Participants

Invariant constituents	# of occurrences	% of occurrences
Identification of a qualified alternative supplier	6	67%
Proactive identification and planning of supplier and potential risk exposure	4	44%
Formation of supply chain disruption teams	3	34%
Use of supply chain management software	2	22%
Strengthening of supply chain network	2	22%
Disaster recovery planning	1	11%

In terms of proactive planning, four of the participants mentioned that companies develop proactive planning strategies by identifying and planning programmable actions for potential supply chain risk exposures. Participant 03 shared that they proactively identified contractual terms and conditions that support the use of alternative source of supply base should there be deviations from any contract services. Participant 03 also noted that alternative use of a secondary supply network is a legitimate course of action and is protected in the suppliers' contract terms and conditions. Participant 03 used these programmable actions as "disaster recovery planning."

Additionally, Participant 04 mentioned that planning is part of his strategies in ensuring that the organization and employees can respond quickly should supply chain disruption happen. Participant 04 noted, "I build in a plan in advance to ensure that all functions clearly understand their various roles in case of a disruption and that plan is

practiced.” Identification of proactive measures for supply chain disruptions is an indication of how proactive companies are doing to manage risk and resilient they were in responding to crisis as it emerged (Hill, Jones, & Schilling, 2014). The level of efficiency and effective navigation of task in a critical situations are high among companies equiped with training and resources for supply chain disruptions (Heckman et al., 2014; Njegomir & Rihter, 2015; Rushton et al., 2014; Wisner et al., 2016).

Finally, Participant 05 articulated the priorities he had in preparing the company’s response to any supply chain disruptions. Participant 05 noted that they “Developed a robust supplier alliance network, shortened lead times for critical items, established a recovery planning system in the event of a potential disruption.” Participant 08 also reiterated the use of the 7-step strategic sourcing process to describe the development of a contingency plan that identifies the actions for any identified financial, quality, environmental, labor, and sole source risks.

Proactive planning was also mentioned in several past studies on supply chain disruptions (Schmitt & Singh, 2012; Snyder et al., 2016; Wisner et al., 2016). Scholars have considered having proactive plans as management practices for product placement and backup plans, as it could improve supply chain disruption management. Research shows that managers who plan for potential disruptions have better holistic understanding of supply management (McNeil et al., 2015; Naidu & Patel, 2013). This understanding is critical for management programs to be most effective and sustainable; companies have to approach them holistically, from a portfolio, stakeholder, and legitimacy standpoint (Aziz et al., 2015).

Three of the participants also mentioned the establishment of a cross-functional team who are responsible in ensuring the planning and execution of supply chain disruption and mitigation strategies. Participant 07 mentioned the importance of the company to work with stakeholders and the cross-functional team members “to review any possibilities to avoid disruption.” Participant 09 shared, “We have a dedicated team who manages the supply chain risk management. They provide direction to the overall organization on SCR risk mitigation strategies.” Participant 08 described the important function of the team, stressing this team is responsible in evaluating the likelihood of the supplier for any supply disruption and in obligating them to reduce risk factors.

Participant 08 said that the “senior cross functional team and that team wanted to see actions plans to reduce those risks.” Though participants mentioned a cross-functional team as a strategy, past researchers have only identified a focal person or a specific department within the organization as individual or group of individuals having roles in managing current and preventing future risk (Hida, 2015; Linares-Navarro et al., 2014; Simba, 2013). Individuals like CROs and procurement team members are mostly the people in charge of the general management of outsourced, and off-shored, supply chain components.

As another strategy, participants mentioned the use of software. Although use of management software is common in many Fortune 500 companies, it is uncommon for these supply chain professionals to use programs focused on the mitigation of supply chain disruptions. Among these professionals are Participant 01 and Participant 08, who have used various programs in planning and evaluating the effectiveness and efficiency

of supply chain activities. This finding is supported several studies implying the need for supply chain managers to incorporate technology and innovation to improve supply chain processes (Altug & Van Ryzin, 2014; Narayana et al., 2014; Schönsleben, 2016; Wagner & Neshat, 2012). These innovations further implicate the use of measuring and evaluating the effectiveness of supply chain approaches and predictions of possible disruptions.

Participants had various responses regarding software. Participant 01 noted the importance of the use of software for cost risk management that “established measures for effectiveness and program efficiency.” Participants 01 further mentioned that “For physical supply risk management, table top simulations of disruptions can find gross ineffectiveness.” Participant 08 noted various programs that are useful in all aspects of supply chain processes and risks:

There are many software companies that claim that they use supply chain risk disruption packages. I personally have not used any of these software packages, but it might be worth taking a look at them for their effectiveness and efficiency of mitigating risks. Here is a list of software packaging that I have come across: Hiperos, HicX, Arvo, Jagger, Ariba, Ecovivis, ive Source, Resilink, and Risk Methods.

Both Participant 01 and Participant 08 believed that the modeling and simulation using various programs could provide managers with the needed accuracy to make such assessments and gain better understanding of potential risks and disruptions. This practical belief is vertically aligned with few theoretical frameworks such as Wagner and

Neshat, who used normal accident theory and high-reliability theory, and Matta et al. (2014), who presented the integrated definition for function modeling to create a model for more accurate measurements on supply chain disruptions. These models have been adopted in most current software to improve risk management around supply disruptions, strategic decisions, sourcing decisions, contracts and incentives, inventory, and facility location. These models could also go a long way in assisting managers to determine and manage the level of vulnerability within supply chains (Wagner & Neshat, 2012).

Two strategies—strengthening of supply chain network and disaster recovery planning—were mentioned alongside other strategies such as identification of qualified alternative supplier and proactive identification and planning of supplier and potential risk exposure. These strategies identify various activities that support the education of the supplier network and collaborative difficulties between the companies and other supply chain stakeholders. The emerging ideas in Theme 1 reinforce the participants acknowledgement of the weakness and strength of a potential strategy that could address identified risks in supply chain. This is consistent with Dionne's (2013) corporate risk management framework, where executives balance off the corporate investments and priorities with potential gains. However, the findings also provided significant ideas in exploring new theoretical concepts that may predict potential risk and gains of a new corporate investment in relation to supply chain.

Although I did not explore multitier supply chain management in my review of literature, the findings relating to supply base diversification directed me to review recent knowledge about the concept. My review concerning the literature directed me to the

workable ideas of Participant 08 and 09, who shared that diversification of supply base creates a stable supply chain, which mitigate potential risk in any unexpected increase in production cost. Participant 09 described the importance of alternative supply base using the terms alternatives physical product flows, observing, “Pharmaceutical manufacturing process, a product flows between 2-3 locations before becoming a finished product.” Having a diverse supply chain ensured that they “have plants which purposely manufacture very small volumes to ensure it remains a hot BCP.” This concept along with the findings of this present study is a potential discourse for future research.

Theme 2

Four of the participants implicated a condition that supply chain disruption plans and mitigation strategies have no value without the support of the top management executives. In fact, these participants considered the organizational support as one of the main barriers in the development and execution of disruption risk mitigation strategies. This finding is significant and supported by previous research that has suggested the agreement of corporate leadership in the importance of supply chain management (Deptula & Knosala, 2015; Dionne, 2013; Gates et al., 2012; Lam, 2014; Wagner & Neshat, 2012). However, only a few studied have mentioned characteristics of leadership and behaviors of leaders that are appropriate in effective supply chain risk management.

The theme was also determined by participant responses, such as Participant 03, who mentioned, “It is generally not a top priority of an organization” to support supply chain disruption strategies. Participant 03 shared that without the support of the executives, there is limited investments in mitigating identified risk factors. Participant

03 resolved this barrier by “Going outside to get support to develop strategy is one possibility.” This behavior demonstrated by Participant 03 is an important finding, as previous studies have not explored the effective behavioral characteristics of supply chain managers in supply risk management situations (Verghese, 2014). Participant 06 also shared that “Organization support is critical to success.” Participant 06 mentioned that all mitigation strategies be management operation-led initiative and also shared that challenges in the operation may be critically expensive that require the approval and support from the company’s investment and procurement budget. Participant 06 noted, “Switching cost and new supplier development can present challenges. Continuous education to the supply base is another key element in driving implementation. Effort is resource intensive.” The participants demonstrated behaviors of willingness to support organizational success despite leadership issues. In this study, the participants considered corporate leadership as barrier in the successful execution of effective supply chain disruption strategies.

Although previous research has highlighted the importance of corporate support during and toward innovation (Krasteva et al., 2015), this study did not detail innovations within supply chain risk management. However, corporate support is relevant for innovation, which requires support from companies (Heckman et al., 2014; Hopkin, 2014; Kaplan & Mikes, 2012; Krasteva et al., 2015; MacDonald & Corsi, 2013; Revilla & Sáenz, 2014). Though not specific to innovation, Participant 09 mentioned that the company has a dedicated team to provide the risk management support for supply chain but “they need to influence the business units to implement the risk strategies.” Thus,

negotiation skills and active involvement of employees are significant in the integration of supply risk management strategies in the overall corporate planning strategies.

Participant 08 continued to share that the business units are responsible to fund the execution plans.” Participant 08 shared the complex nature of politics and leadership in influencing management decisions and said, “It can be difficult and sometimes very political to influence local plant decisions.” The leadership style of execution requires leader to incorporate high level of negotiation skills. An articulation of this requirement was mentioned in previous studies that stress the importance of the CRO’s role within supply chain disruption risk management and that they needed support and proper decision-making and skills development (Heckman et al., 2014; Hopkin, 2014; Kaplan & Mikes, 2012; MacDonald & Corsi, 2013; Revilla & Sáenz, 2014).

Participant 08 offered a similar thought but identified this barrier as an opportunity that any supply chain professionals could explore. Participant 08 emphasized that no plans are effective without a capable leadership who can negotiate and influence business stakeholders in funding risk management plans. Participant 08 observed, “the major barrier is to get top management to focus on and commit to necessary headcount; system support and allocated budget (e.g. travel dollars).” Although his company was supportive in risk management, he claimed that “many companies are not convinced of the merits or benefits of an expanded Risk Management program.” Table 2 shows the organizational requirements in the execution of supply chain disruption plans and strategies.

Table 2

Theme 2 Based on Strategies from Participants

Invariant constituents	# of occurrences	% of occurrences
Support and priorities of top management executives	6	67%
Organizational support	4	44%
Negotiation skills of supply chain managers	4	44%

Corporate risk management framework focuses in the identification of potential strengths and weaknesses within supply chains and determining active and practical ways of minimizing noted weaknesses, and mitigate potential risks (Dionne, 2013). The findings of the present study clearly articulate that leadership of the companies involved aim at supporting strategies, which have tangible gains. Although the participants were unable to mention about the comparative assessment of their organizations with effective supply chain strategies implemented in other companies, I was able to link the supply chain success of Participant 08 who led a global multimillion company. The successes of Participant 08 in the execution of his desired supply risk plans are brought about the size, type, and infrastructure available to support supply chain contingency plans. This observation significantly applies to the second tenet of corporate risk management (Dionne, 2013), which leaders assess the applicability of the strategies to the companies' investment capabilities.

As findings of the study illustrated the role of leadership in supply chain, it directed me to review relevant concepts of leadership in the context of supply chain risk management. Exploring the concept of leadership allows me to relate the critical

negotiation skills and commitment required for supply chain managers to successfully execute supply chain risk plans (Verghese, 2014). The participants in the study strived to look for better ways to carry out supply chain processes, and freely offer ideas and constructive criticism to the supply chain leader and other members in the desire to improve overall supply chain performance. They have championed new ideas despite leadership resistance to change initiatives.

Applications to Professional Practice

In this qualitative multiple case study, I explored the strategies personal care business supply chain managers use to mitigate supply chain disruption risk. The population included nine supply chain managers from five Fortune 500 CPG personal care companies located in the northeastern United States who have successfully used strategies to mitigate supply chain disruptions. I recruited supply chain managers as they are the most appropriate population who could provide answers in determining and implementing strategies to mitigate any supply chain disruptions. I purposely selected the population from Fortune 500 CPG personal care companies located in the northeastern United States as cases of the reduction of profitability and lack of strategies to mitigate supply chain disruption risk are high in this sector. My intention in exploring this research problem was to create a social change for society and communities through the most efficient management of company assets, which can enable more effective utilization of resources, and reducing costs for business and consumers. I argued that a reduction of production costs could result in more resources being available to consumers that could augment their standard of living. This argument guides my assertion in

identifying important aspect in the supply chain operations that manager and business leaders could potentially use.

While literature in supply chain management expressed the importance of a qualified source of supply in the operation of the business, most management pays less importance the process of qualifying alternative pool of suppliers or to establish supplier networks to support various supply chain processes (Chopra & Sodhi, 2014; Park, Hong, & Roh, 2013). In the light of the findings, I argued that qualification of alternative supply networks in the company's supply chain disruption plans is a necessity that serves as "insurance" in the production processes. The qualifications of this alternative supplier could be an individual or group of individuals who could meet the company standards and procedures. Along this statement, business leaders could explore implementing the provision of policy support systems for the alternative suppliers to cope and meet the supply demands of the company. This strategy is achievable when integrated with disaster recovery planning and strategies to diversify supply base.

A diversified supply base and strengthened supply network ensures a stable source of supply and production cost. With this mitigation strategy, alternative suppliers are evaluated for quality and continuously receive productivity monitoring report to help them cope with the quality standards required by the company. An example could be an inclusion of alternative suppliers in the Supplier Evaluation Rating System and offering supplier development support as an organizational policy.

While establishing a supplier network can serve as alternative source of supply in the event of disruptions, this strategy is one of the costliest strategies. Under normal

operations, establishing relationship with alternative suppliers, investments in training activities among others adds to the production cost of the company. Though these types of strategies may be less efficient and costly in normal operations, these strategies assured the continuous supply of materials required in the production of most companies. This is often regarded as insurance to managers who considered the importance of supply chain risk management. The additional operational cost resulting from widening and strengthening the supply base and network posed a real challenge to managers handling supply chain disruption activities. Continuous education for alternative suppliers to meet quality and standard supplies is resource intensive, which affect product and marketing cost.

Other strategies that business leaders and supply chain managers can explore include the development of proactive programmable actions and organization of cross-functional team that focuses in addressing potential supply chain risk exposures. While the former is not a new strategy, the latter is a valuable addition to the traditional style in managing supply chain disruptions. The traditional procurement policy to support the supply for production is to ensure that the company is covered legally should there be deviations from any contract services. Among the common legal procedures are suppliers absorb all cost of delays and deliveries of substandard goods. The companies that are sensitive to supply chain risk management could organize cross-functional teams that focus in leading, monitoring, and evaluating suppliers' identification and qualification as well as strengthening the network base through continuous training and coaching of primary and other qualified suppliers.

As corporate leadership determines the organizational direction and priorities of the company, the supply chain managers should continuously persuade leaders to financially support non-traditional methods of addressing supply chain disruptions. An example could be a policy supporting the strengthening of supply base and supplier networks. As leadership support is critical in risk management, managers handling the risk operation may need to develop soft skills such as negotiation and marketing skills to position risk management activities part of the insurance operational strategies rather than pure operational cost. These professional development activities are essential in generating organizational leadership support for any proactive and innovative strategies for supply chain risk mitigation.

The understanding of the current difficulties of managers implementing mitigation strategies aided the construction of a more developed and invocative plans that are well-accepted and financially supported by the organizational leadership. Financial projections accrued because of implementing innovative risk management strategies outweighs potential effects of supply disruptions. This is evident in the data suggesting the operational performance of personal care companies as result of the lack of strategies in mitigating supply disruptions. The traditional methods such as financial projections, insurance, legal and internal policies and regulations, and risk modeling within personal care companies had proven to be less effective without innovation of strategies and support of these innovations from the top executive leaders.

Implications for Social Change

Corporate risk management is the conscious effort of the management to identify and use various methods to minimize financial losses because of external threats to a corporation such as the fluctuations of commodity prices and availability of supplies affect its financial assets. Risk managers, executives, line managers and middle managers, as well as all employees, perform practices to prevent loss exposure through internal controls of people and technologies. While corporate risk management has become one of the pillars in the sustainable operation of most global multimillion companies, the current study implicated the inability of some personal care business supply chain managers in implementing innovative strategies to mitigate supply chain disruption risk. I regarded the result of present study an important addition to the literature in supply chain as it articulates the pressing hurdles that managers of Fortune 500 CEOs of personal care companies located in the northeastern United States experience when implementing mitigation strategies in their respective companies.

The well-executed supply chain risk mitigation plans support organizational profitability and sustainability. Implementation of this mitigation plans could result in the reductions of inventory, which when achieve result to more operational savings that could be substantially shared both by the company and consumers. Secondly, the organizational support in these innovative ideas could achieve reduction of transactional cost, which translate to substantial operations savings that affects product pricing. Third, reduction of supplier redundancy while maintaining wide network of alternative suppliers can reduce product costs by increasing production levels at remaining suppliers and

reducing the costs of managing the supply chain. Although this can also increase investment and management burdens on suppliers, the delegation of responsibility and authority to entities closer to the action can result in improved decision making, should the management be able to maintain communications throughout the chain.

High production costs affect prices as companies must have prices that are high enough to cover the costs of production. Consequently, without covering the cost for any potential supply disruption, the accrued losses can incrementally pass on to consumer pricing making the goods more expensive. A strategic integration of risk management strategies with lesser impact to production cost can significantly help companies stabilize production strategies and product pricing. With innovations and proper execution of the cost associated with the risk, companies are more proficient in the utilization of resources to support effective and efficient production. At the consumer level, companies are empowering their buying capability by making affordable products and fulfill their personal needs. A more empowered community indicates high return of investments for companies, which in turn could support employment and government taxation necessary to finance social programs.

Recommendations for Action

The purpose of this qualitative multiple case study was to explore the strategies personal care business supply chain managers use to mitigate supply chain disruption risk. The results implicated that while middle management strives to protect the company against potential risks and disruptions, organizational leadership must refocus their views

concerning risk management as pure operational cost. This general impression is my basis in articulating the following recommendation.

First, as results of the study suggest the inabilities of risk managers to persuade organizational leadership in supporting the innovative risk management strategies, I recommend that risk managers should begin the process by identifying their professional development needs particularly in the aspect of negotiation and marketing skills. Although these are soft skills and are not directly related to risk management, integrating a crucial yet expensive innovations that could affect the cost of production ignite resistance from leader who aim to balance the supply-demand performance of the companies.

Risk managers must have better understanding in economics as well as the consequences associated with risks to influence leaders' support and decisions. A more knowledgeable risk manager who knows the advantages and disadvantages of specific innovations to organization can articulate mitigations strategies that balances organizational tradeoffs. An example of this includes the tradeoffs of financing programs to support the identification and qualifications of alternative suppliers who may have the relevance only during disruptions of supplies. A knowledgeable risk manager with competent skill in negotiations could satisfy the information needs required by leaders to support the strategies.

Future researchers who would want to use corporate risk management in research could potentially consider augmenting the framework using the context of leadership. Supply chain management deals with fragile strategies and uncertainties that leadership

must decide and balance corporate investments that will not sacrifice the investment and sustainability of the company. Doing that would require essential steps such as the publication of the present study in students and professional journals and presentation of relevant findings to conferences and professional meetings.

Recommendations for Further Research

The first recommendation is to qualify personal care companies according to size, assets, and market reach. Companies at varying levels of size, assets, and market reach, have different capabilities in terms of funding risk mitigation plans and strategies, which could affect how risk managers handle these activities within the company. Moreover, there might be different factors that influence the execution and implementation of risk management strategies that are specific to a company. As a recommendation for further research, there may be great promise in exploring further the reasons why the differences or relationship may or may not exist or even how the differences came to exist in the first place.

The second recommendation is to conduct a mixed method study to determine the extent of use and the level of support the organization leaders have in terms of implementing risk mitigation strategies. Using a mix of both quantitative and qualitative research and data, the researcher could gain breadth and depth of understanding and corroboration while offsetting the weaknesses inherent to using each approach by itself. Mixed method allows for triangulation which is crucial in studying a phenomenon that requires understanding from different vantage points using different methods and techniques.

The third recommendation is to use the information in this study to develop a program necessary in the articulation of effective and efficient mitigation strategies that organizational leadership can support. It is however important that the findings of the study be shared in conferences and meetings to create awareness within the industry and among the leaders in industries where risk management is less supported.

The fourth recommendation focuses in strengthening the limitation of the study for future research. The availability and proximity of the study participants directed me to use e-mail interviews as opposed to face-to-face interview, where non-verbal cues and impromptu clarifications are feasible. Given this constraint, I could have clarified essential aspect about the organizational leadership and policies supporting supply chain. Future researcher could essentially adapt strategies and invest in securing the availability of these supply chain leaders and managers.

Reflections

There are various reflections I noted while I completed this research, which are essential in determining my biases and the extent of my knowledge concerning supply chain disruptions. On top of my list include my biases concerning the use of corporate risk management as the sole framework that could best guide me in the analysis of my data. In the preparation of my study, my concentration in reading and writing the review of literature came from my assumptions that implementation of supply chain risk mitigation plans are transactional endeavors between the business owners and supply chain managers. In the process of collecting the data, I did not articulate or clarified salient leadership behaviors though it was apparent that the participants valued how

organizational decisions influence the execution of supply chain mitigation strategies. The process of coding and engaging myself in the iterative process of thematic analysis directed me to consider organizational leadership an essential part of my study.

While completing my literature search, I discovered that supply chain managers require skills, healthy inter-company and interpersonal relationships, as well as company and legislative support to ensure efficient and effective supply chain performance and risk management. Of note was the importance of CRO autonomy and risk management training as a means of ensuring successful supply chain disruption risk management (Hida, 2015; Hill et al., 2014; Linares-Navarro et al., 2014; Marcelino-Sádaba et al., 2014; Simba, 2013). I noted the importance of adequate insurance, industry awareness, and decision-making. These learnings were translated into actual events as I discovered the hurdles of risk managers in the implementation of the mitigation strategies without the support of organizational leadership.

From the result of the present study, it was evident that risk managers knew the solutions, techniques and/or processes regarding risk management. However, this knowledge, without compelling skills in influencing leaders is not enough to support actions. I have noted that managers from personal care companies have innovative ideas and tools for streamlining supply chain processes, bettering management techniques, and promoting employee participation in problem-solving. The only hurdle comes from the leaders' inability to respond and support the innovations.

Conclusion

In this qualitative multiple case study, I explored the strategies personal care business supply chain managers use to mitigate supply chain disruption risk using the experiences of nine supply chain managers from five Fortune 500 CPG personal care companies located in the northeastern United States. The findings of the study suggest that supply chain risk management requires understanding of all-encompassing issues about finance, operation, human relationship, and leadership to execute risk mitigation plans and strategies that balances organizational tradeoffs and social responsibility.

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Appendix: Interview Protocol

The purpose of this interview is to explore the strategies personal care business supply chain managers use to mitigate supply chain disruption risk. Participants are supply chain managers. I will follow the guidelines listed below:

1. I will introduce myself to the participants. I will provide an overview of the study and the interview process.
2. I will present a copy of the informed consent form so that the participants can read and sign before doing the interview. The participant will sign two copies of the informed consent form.
3. The interview questions will be e-mailed to the participants for their completion.
4. After the questions, I will thank the participants for their participation and conduct member checking.

Interview Questions

1. What is your history in mitigating risk within the supply chain?
2. What strategies do you use to reduce and manage supply chain disruption risk?
3. How have you updated supply chain disruption risk mitigation strategies over time?
4. What, if any, barriers did you encounter in developing and implementing supply chain disruption risk mitigation strategies?
5. How, if needed, did you address barriers in developing and implementing supply chain disruption risk mitigation strategies?
6. How did you assess the effectiveness of the strategies you employed?
7. How have your experiences with the strategies for reducing and managing supply chain disruptions influenced your plans for responding to a supply chain crisis moving forward?
8. What additional information can you share regarding strategies to mitigate supply chain disruptions?