

**SUPPLY CHAIN RESILIENCE AND PERFORMANCE OF
SUPERMARKETS IN NAIROBI COUNTY, KENYA**

BY

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DECLARATION

STUDENT'S DECLARATION

I would like to declare that this is my original work and has not been submitted to any learning institution except the University of Nairobi for the purpose of examination.

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SUPERVISOR'S DECLARATION

The research project was submitted with my authority as the University supervisor for examination.

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DEDICATION

This project is dedicated to my parents for the unwavering support and motivation to this academic level.

ACKNOWLEDGEMENT

I thank God for His grace, wisdom and patience all through the research period as all was made possible by His grace. Credit to my supervisor for the time and advice all through the research period.

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LIST OF ABBREVIATIONS

SCM	-	Supply chain management
COVID 19	-	Coronavirus
RBV	-	Resource-based view
SC	-	Supply chain
DCT	-	Dynamic capability theory
SCT	-	Strategic choice theory

ABSTRACT

The purpose of the study was to study the effect of supply chain resilience practices on the performance of small and medium supermarkets in Nairobi city, Kenya. The study was guided by the following specific objectives; to determine the supply chain resilience practices adopted by small and medium supermarkets in Nairobi County, Kenya, to determine the effect of supply chain resilience practices on the performance of small and medium supermarkets in Nairobi city, Kenya. The study relied on three theories that included the dynamic capability theory, strategic choice theory and resource-based theory. A descriptive research design was used as the study targeted all the 53 small and medium retail supermarkets in Nairobi County. The study adopted the census method and questionnaires were used to collect primary data. Data analysis was undertaken by use of SPSS and findings presented by the use of figures and tables. The first objective was realised as the study determined that the most significantly used supply chain resilience practice by supermarkets was strategic collaboration(33.3%) as it was adopted to a high extent followed by agile practice (28.9%), supply chain reengineering(22.2%) and lastly was the risk management culture(15.6%). The second objective was realised as the study determined supply chain reengineering ($\beta=0.91, P=0.047 < 0.05$), Agile ($\beta=0.173, P=0.016 < 0.05$), Risk management culture ($\beta=0.620, P=0.003 < 0.05$) and Strategic collaboration ($\beta=0.225, P=0.002 < 0.05$) have a positive impact on the supermarkets' supply chain performance. The study recommended the strategic and middle-level managers to increase their investments in the supply chain resilience practices to be able to influence their supply chain performance positively. The research was restricted to small and medium supermarkets in Nairobi, Kenya as a result of lean resources. The researchers are to consider the adoption of supply chain resilience practices in other sectors during the crisis period and not the retail industry in their research. There exist other supply chain resilience practices apart from the four that the study is based on and further research should make considerations for them to be studied.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The retail sector is at the coalface of immediate impact and faces a significant challenge to respond to the emerging crisis effectively. The focus of many companies has shifted to limit exposing their employees as well as their customers to the virus as the number of cases of persons with the COVID 19 virus increases across the world (Michie, 2020). In most countries, the retail sector has already started to feel the early impacts of the COVID 19 virus as the customer demand declines as well as the threat from online and discount models. Retailers are feeling the impact of coronavirus as products that are shipped from China and Europe fail to arrive at the required time. Performance in a firm's operations has been described by Kapsali, Roehrich, and Akhtar (2019), as that part of an entity's processes that can be measured. It involves aspects like managing inventory, cycle and lead times, overall productivity, the agility of an entity, timely deliveries, quality, and reliability. The widespread of the virus makes the retailers face collapse in both their supply and demand. All the retailers are faced with the question of how they would flexibly respond to the COVID 9 challenges in an agile manner by adapting their mode of operation and commercial decision making rapidly to reflect the new reality (Bartik et al. 2020).

The study will make use of dynamic capability, resource-based, and strategic choice theories. The strategic choice theory shows the existence of a link between the management choices and business performance. The evaluation, identification, monitoring, and mitigation actions towards an unexpected event, dictate an organization's performance. The resource-based theory shows that organizations rely on their available resources to realize competitive advantage enhancing their performance levels. The identification of risks, evaluation, monitoring, and mitigation require entities to avail the required resources to curb the risks

easily (Özbağ, & Arslan, 2020). Dynamic possibility theory entails an organization bearing the ability to reconfigure, integrate, regenerate resources and capabilities as they respond to the ever-changing environment they operate in.

The supermarkets have entered into the urban food retail and are expanding fast from their initial small market comprising of the middle class to the lower-income class markets. As communities continue being quarantined, retail supermarkets play a significant role in feeding and protecting the local population. A supermarkets supply chain performance is described by Thanki and Thakkar (2018) as to how effective and efficient the supply chain process of a firm is. It can be indicated by how a supplier performs in their duties, how the consumer rates your product and services, how efficient the deliveries are, cycle time and the availability and accessibility of the product. The effects of the global pandemic, however, have limited their operations and cut the flow of goods from global markets and restricted movement into stores in a measure to reduce the spread of the viral disease (Jones & Comfort, 2020). When it gets to extreme situations, the retail competitors are to work together to be able to better serve their customers through imposing strict safety measures to cut the spread of the virus, share stock data and pricing to maximize the availability of essential products, defining rules that ensure the entire population is properly supplied and working side by side with authorities and competitors to effectively coordinate logistics.

1.1.1 Supply chain resilience

Resilience is the capacity of a company's supply chain to be ready for uncertain events that are not expected in the course of their operations, respond and quickly recover from the interruption to go back to their initial operation situation increasing customer service, financial performance and market share (Grant & Stolt, 2020). Supply chain resilience practices are strategies to mitigate risks in the supply chain by anticipating, resisting,

recovering and responding to both the unprecedented and foreseen risks in the organization's value chain. Resilience in the chain of supply requires reengineering of the functions of the supply chain along with their activities, the stakeholder collaboration in the entire supply chain, development of an agile supply chain, and formulation of a culture of risk mitigation in an entity (Grant & Stolt, 2020). Companies are increasingly being warned on disruption along supply chains which are key components of global economies. Companies are developing resilience practices across their supply chains to mitigate the risks they face emanating from global pandemics, complications in the functioning of supply chains and technology to be able to gain competitive advantage (Goldbeck, Angeloudis & Ochieng, 2020). The majority of the companies make use of statistical data to develop methods of risk mitigation, however, unexpected events such as pandemics and natural disasters challenge risk mitigation strategies based on the conventional risk mitigation measures. Moreover to be able to manage risks by use of the traditional methods is to be backed by capacity building through the implementation of resilience capability measures.

According to Brandon Jones, Squire, Autry, and Petersen (2014), the framework for a proper supply chain network is based on the resilience techniques adopted to provide for operations continuity and sustainability of a firm in an environment that is competitive. The stakeholders across the supply chain are to develop significant ideas for mutual benefit basing on information sharing, trust, and collective improvement to realize reliance along their supply chains. Joint scheduling and planning of operations ensure risks are mitigated and provide measures to recover from disruption. Resilience techniques to be adopted will be based on collaboration by players across the value chain to come up with measures that they will depend on when their operations are disrupted, agility basing on their response time,

visibility across the supply chain and formulation the culture of risk mitigation across the value chain.

1.1.2 Supply chain Performance

Performance in a firms Supply chain operations has been defined by Kapsali, Roehrich, and Akhtar (2019), as that part of an entity's processes that can be measured. It involves aspects like managing inventory, cycle and lead times, overall productivity, the agility of an entity, timely deliveries, quality, and reliability. Supply chain performance is described by Thanki and Thakkar (2018) as to how effective and efficient the supply chain process of a firm is. The performance of an entity's supply chain is indicated by how a supplier performs in his duties, how the consumer rates your product and services, how efficient the deliveries are, cycle time and the availability and accessibility of the product. Performance measurement is the process involved in quantifying how effective and efficient the operations of a firm are according to Kapsali, Roehrich and Akhtar (2019).

The key business drivers in any organization are operations as it's only through operations that companies find their strategic fit by ascertaining the right talent, developing better cost management policies and ensuring a competitive edge in a competitive market. Performance determines the organization's efficiency in productivity to maintain an effective and efficient method and satisfaction level to impose on their customers (Brandon Jones, Squire, Autry & Petersen, 2014). The growth in quality of customer service has significantly been affected by the ever-changing world economies, unforeseen global pandemics, changing customer needs and change in preference which are influenced by growing consumerism and competitive business environments. Performance is essential to customer satisfaction as the internal processes and activities are well directed at innovation improvement enhancing the firm's financial returns.

1.1.3 Supermarkets in Nairobi

Supermarkets range from retail supermarkets that are significantly established to independent single store supermarkets. Stanton and Futrell (1987) define a supermarket as a large departmental retail store that offers different merchandise and operates on self-service with minimal customer service. The growth of supermarkets is attributed to urbanization, growth of the middle class, change in customer's lifestyle and market liberation which has increased competition. Supermarkets are categorized into small and medium supermarkets.

A supermarket is a retailing store with different subdivisions below one roof that operates on a self-service basis. A small supermarket has a minimum of 10 to 15 employees and a minimum of three selling points or cashiers. The medium supermarkets have more than 20 employees with a minimum of six selling points whereas the large supermarkets mainly cover square meter foot of between 10, 0000-60,000 with more than 50 employees (Mithamo, Marwa & Letting, 2014).

The retail sector has expanded by 13 percent in the past three years which translates to total retail spending of Sh1.8 trillion in 2016 (Procter & Gamble, 2016). The increase in spending is attributed to 30 percent of Kenya's GDP in 2016. The growth is due to the entrance of international retailers like Carrefour. Kenya's retail market had on average an annual GDP 5.6 percent rate of growth from 2009 to 2014. The supermarkets contribute to the economy, provide employment opportunities for many people and act as a convenience to many shoppers since they provide almost all household things under one roof (Karuga & Ntungwe, 2017). However, the sector is being faced by some challenges like Pilferage which can be directly attributed to the industry's annual loss and supply chain disruption as a result of

global pandemics. Most retail supermarkets adopting supply chain resilience measures to mitigate the tough situation caused by the unforeseen global pandemic.

1.2 Research problem

Supply chains are significant study areas for researchers during the period of COVID 19 pandemic. Small and medium retail supermarkets play a big role in their operations as they provide the local population with food products along with other significant consumables during the crisis period (Mithamo, Marwa & Letting, 2014). Supply chain resilience practices are adopted by retail supermarkets for anticipating, resisting, responding and recovery from the unprecedented disruptions of their supply chains.

The supermarkets contribute to the economy and act as a convenience to many shoppers since they provide almost all household things under one roof (Karuga & Ntungwe, 2017). However, the sector is being faced by supply chain disruptions from the unforeseen global pandemic of COVID 19. As a result, adoption of resilience practices along the supply chain is an essential endeavor to ensure continuity and risk mitigation.

Globally, a study conducted by Awwed (2018) on the theory of supply chain resilience in Toyota determined that collaboration between stakeholders enables resilience. Macfadyen et al. (2015) study on the importance of retail food entities in the improvement of food supply chain resilience across the world ascertained that supply is not stable and is prone to disruption. A study by Aigbogun, Ghazali, and Razali (2014) about a scheme that enhances the Malaysian pharmaceutical industries supply chain resilience, indicated agility, and collaboration help in reducing disruption risks. Frohlich and Westbrook (2001) studied the performance outcome of the integration of operations between the suppliers and the consumers of the organization.

Locally a study undertaken by Munywoki (2016) study on supply chain risk mitigation practices effect on Nairobi automotive tire retailer's determined the presence of a positive relationship between practices for mitigating risks and performance of a firm. The study by Aluda (2015) on techniques of risk management in vendors of telecommunication equipment supply chain in Kenya revealed several practices for risk mitigation have not been implemented successfully. Cheng'e (2014) on the effect of risk factors on petroleum industry performance, indicated transport risks and risks in distribution are major risk areas for disruption. A study conducted by Bichanga, and Mwangi, (2014) evaluated the importance of supply chain visibility effectiveness in Uchumi supermarkets in Kenya ascertained the stakeholders are to access accurate information to counter any disruptions. However, none of the studies looked into the impact of supply chain resilience practices on the performance of small and medium retail supermarkets during an unforeseen global pandemic of COVID19. The research intends to cover the gap portrayed by addressing the following research question: What is the effect of supply chain resilience practices on the performance of supermarkets in Nairobi County, Kenya?

1.3 Research objectives

The main objective of the study is to establish the impact of supply chain resilience practices adopted on the performance of supermarkets in Nairobi County, Kenya.

Specific objectives are:

- i. To determine the supply chain resilience practices adopted by supermarkets in Nairobi county, Kenya.
- ii. To determine the effects of the supply chain resilience on supply chain performance of supermarkets in Nairobi County, Kenya.

1.4 Value of the study

The research is essential to all the small and medium supermarkets and the retail industry in Kenya in the identification of retail resilience practices that may be used to enhance the performance of the sector in the wake of the global COVID 19 pandemic. The study also helps organizations realize the gaps their supply chains are exposed to while mitigating risks as they hardly plan for unprecedented global disruptions like the case of the global pandemic of COVID 19. The study is also important to other companies as it enables them to realize the significance of resilience practices to be used in their supply chains to counter uncertainties, risks and disruptions. Researchers also are to benefit from the study's comprehensive insights to develop new understanding about resilience practices in supply chains and their effect on any organization to counter the disruptive effect of global pandemics.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The section looks into the previous studies that were undertaken by several researchers. The areas covered include the theoretical review, empirical review, supply chain resilience, retail performance, and a conceptual framework.

2.2 Theoretical framework

A theory is a set of accepted facts and assumptions which indicate a plausible explanation of the existence of cause and effect relationship in an observed phenomenon. This study makes use of three theories as a bedrock of the study and they entail the resource-based theory, dynamic based capability and strategic choice theories.

2.2.1 Dynamic capability theory

The theory was developed by Teece, Pisano and Shuen (1997). It is based on the ability of the firm to be able to renew, reconfigure, integrate and recreate capabilities and resources to be able to react to the uncertain working conditions according to Wang and Ahmed (2007). By aligning the resources, abilities, and capabilities of an entity to the sudden drastic changes in the environment, the organization can boost its operational performance and at the same time giving the entity a competitive edge.

Capabilities according to Augier and Teece (2009) is the means that an organization uses to obtain and accrue different competencies and skills which are fairly new and have not been tried. The new capabilities which have been acquired help to ensure that resources that the firm has are being used effectively and efficiently. This theory is useful in that it gives room for reconfiguring, renewing, recreating and integrating useful materials that are sustainable and also policies that can be adopted in meeting the objectives of the organization. Critics of

the theory argue that dynamic capabilities represent the best practices and cannot be a source of competitive advantage (Easterby, Smith, Lyles & Peteraf, 2009).

2.2.2 Strategic choice theory

The theory is based on interconnection between organizations events and actions. The strategic choice is significant in the management of risks in an integrative approach. The theory illustrates the link between the management of risks, choices, and the overall performance of an organization along with the interaction between an organization and the environment. The theory emphasizes the significance options and practices for risk management to be adopted by management according to Child (1997).

The theory perceives an organization as an entity that is directly affected by their environment as well as the choices that are undertaken in a bid to be in control of the change in both internal and external environment. The theory bears an integrative approach and perceives business entities adaptability, strategic options that influence the actions that management undertakes. The proponents of the theory posit that innovation and proactivity is the guiding principle. The procurement of items is to be done by the use of suppliers that are established to guarantee efficiency.

2.2.3 Resource-based view

The theory relies on the use of a set of available resources which are unique to an organization to realize competitive benefits. The resources in an institution can be categorized into either tangible or intangible assets. The resources which can be touched and felt in an institution are tangible assets while assets that are intangible are made by the staff and management of the business entity and cannot be felt or touched (Alvarez& Busenitz, 2001). The most significant characteristic of the theory is it focuses on the internal forces within a firm that gives it a competitive advantage compared to its competition. Firm's

resources can be categorized based on their capabilities, assets, human resource, risk management resource, location resource, and technological resources.

The resource-based theory provides that firms often compete based on their unique resources available to them and their ability to manage the turbulent risks in their environment (Das, & Teng, 2000). The corporate resources are not easy to come by or substitute as they provide a basis for the organization to gain a competitive edge enhancing their performance. The theory assumes a firm's resources are heterogeneously distributed. It leverages resources on organization resources that are to be used for the development of strategies that are significant to mitigate the risks an organization faces.

2.3 Supply chain resilience

Supply chains are made up of suppliers to organizations, consumers and strategic stakeholders who are engaged in a company's operations. The supply chain resilience is made up of functions and practices which are in charge of anticipating risks, recovery, resisting risks and formulating techniques to counter the unprecedented occurrences in upstream and downstream supply chain operations (Grant & Stolt, 2020). Developing agile supply chains, collaborating across supply chains, reengineering of supply chains and development of risk mitigation culture are significant practices of resilience in supply chains. Resilience in supply chains provides for the high response to customer demand, reduces the cycle time, ensures visibility of transactions, and increases customer service levels. Supply chain resilience unifies the entity's skills, culture and ideas improving decision making while reducing conflict of interest, cost complications and risks improving customer value according to Goldbeck, Angeloudis and Ochieng (2020).

Risk mitigation strategies across a company's supply chain entail the management making use of the risk mitigation culture across the upstream and downstream supply chain. The

strategic management team makes use of measures to instill a culture of mitigating risks in their supply chains to make them resilient to disruptions. It also involves assigning relevant teams across the organization mandate to conduct risk assessment across the supply chain, keep the risk register up to date and communicate to the top management by use of clear communication channels (Tran, Childerhouse, & Deakins, 2016).

Reengineering an entity's supply chain refers to integrating the supply chain process that has the conventional drawbacks, optimizing costs along with customer service to improve flexibility by customizing it while in different situations (Liu et al. 2018). Reengineering of supply chains involves a clear understanding an entity's partners in their supply chains, their respective purpose, the flexibility of the supply chain base by identifying the supplier's risk resources and assessing the present strategies, reevaluate redundancy and efficiency trade-off.

Agility is the response to the changes in demand and supply that are unpredictable. It relies on the market knowledge of a virtual organization to be able to realize opportunities in volatile markets. Agility covers the entire business capability across the structures of the organization, systems of information, processes of risk mitigation and logistic processes. The effectiveness of any agile business ability is in their response to market dynamics quickly which to a significant extent will determine the capability of the entity to outdo the effects of the disruption (Agarwal, Shankar, & Tiwari, 2007). Therefore, agility is extended beyond an individual entity to comprise the firm's operations across its supply chain. The agility of any supply chain is based on a company's ability to quickly respond efficiently to underlying conditions.

Collaboration is the continuous relationship that exists between a business entity and its stakeholders such as suppliers, state and non-state actors. It influences the organizations' plans and operation efficiencies and capability. Collaboration is hinged on a direct long-term

relationship between a firm and the suppliers which provide a basis for shared problem solving and abilities to plan according to Badraoui, Van der Vorst and Boulaksil (2020). Collaboration can be categorized into low interactivity, collaborations that take long periods and shared strategic and operation capabilities. Collaboration provides for mutual benefit and continued engagement in the organization's key areas. It results inefficiency as a business entity only transacts with known suppliers'. It allows suppliers to participate in the design of new products benefiting the organization through cost reduction, risk identification, and assistance during the design process. Supply chain resilience in an organization makes use of collaboration with suppliers in a manner in which the needs of the customers are considered significantly during risk assessment, product design, and operations of a firm.

2.4 Empirical literature review

Globally, a study conducted by Awwed (2018) on the theory of supply chain resilience theory in Toyota determined that collaboration between stakeholders, responsiveness, reengineering supply chains and risk mitigation techniques enable resilience in the Toyota supply chain. Macfadyen et al. (2015) study on the importance of retailers of food products in enhancing the global food supply resilience ascertained the global supply of food is not stable and is prone to shocks and disruption and variability across the supply chain can be minimized through stakeholder engagement and change of operations across large areas. Research by Aigbogun, Ghazali, and Razali (2014) about a framework that enhances resilience in supply chains in the case of the pharmaceutical industry in Malaysia showed agility, integration of systems, collaboration and sharing of information help in reducing the risks to the Malaysian pharmacy industry. Frohlich and Westbrook (2001) conducted a study on the performance outcome of a firm when it integrates its consumers and suppliers in its operations. The research ascertained client-based, a supplier focused, inward and outward-focused and

environment bound practices in a supply chain indicate efficient and effective firm operations.

Locally a study undertaken by Munywoki (2016) study on practices that mitigate risks in the supply chain of automotive tire dealerships in Nairobi established a positive relationship existed between risk mitigation practices and the competitive nature of the firm. The study by Aluda (2015) on techniques of managing risks across the supply chain of telecommunication equipment vendors in Kenya illustrated that despite the management of risks across the supply chain, several practices for risk mitigation have not been implemented successfully to shield them from global unforeseen risks such as pandemics. A study by Cheng'e (2014) on the effect of risk factors on petroleum industry performance, indicated transport risks, risks in distribution and procurement are major factors which when an organization properly manages have a positive correlation with their performance. A study conducted by Bichanga, and Mwangi (2014) evaluated the importance of supply chain visibility effectiveness in Uchumi supermarkets in Kenya ascertained suppliers, customers and stakeholders are to access accurate, timely information of operations across the supply chain to allow organizations to make quick and accurate decisions to counter any disruptions. The studies provided different ways that resilience practices and techniques impact performance of various sectors.

Supply chain performance refers to the process of a retail organization instituting measures to use to reach their goal of sustaining customer satisfaction. Performance of the retailers during disruption involves the determination of the profit, reliability and responsiveness in order to keep the business afloat (Kapsali, Roehrich & Akhtar, 2019). Profit refers to a financial gain which realized whenever the revenue generated from a business activity is higher than the expenses, taxes and costs which are involved in sustaining the activity. Customer satisfaction

is a principal factor in ascertaining the success in the performance of any retail store and is essential to find the factors which affect customer satisfaction. Customers often appreciate the retail stores that are responsive to the underlying external environment and are reliable in their operations to cope with disruptions. In the case of a global pandemic that disrupts retail supermarkets supply chains on a global scale, performance is greatly hindered as there are demand and supply shortage in the market. However, retail firms are to proactively change their mode of operation through the institution of supply chain resilience practices to ensure they are responsive and reliable to the needs of the customer in the underlying conditions of a global pandemic.

2.5 Conceptual framework

It is a theoretical underpinning of study which offers the blueprint of the study (Grant & Osanloo, 2014).

Independent variable

Supply chain resilience

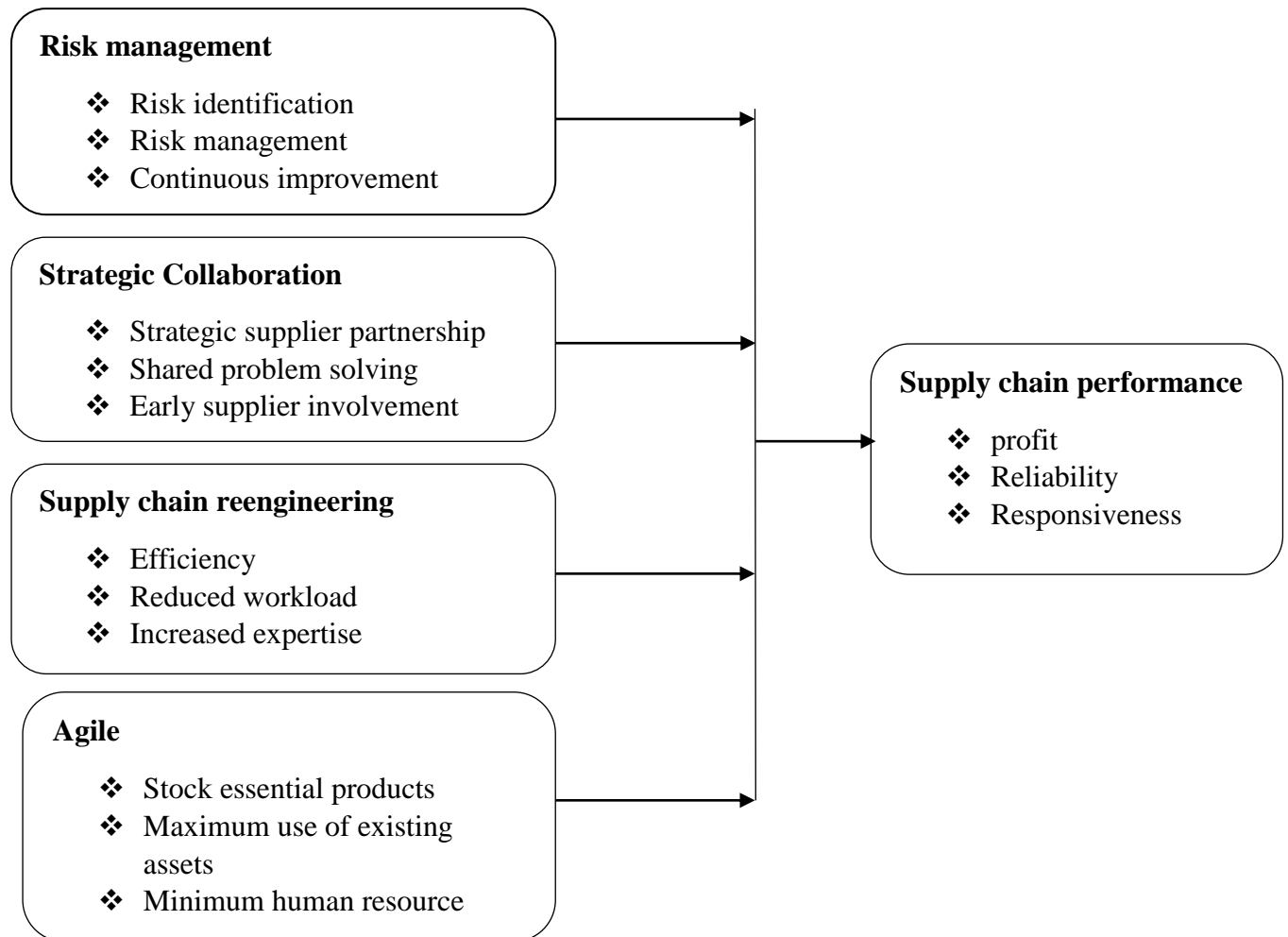


Figure 2. 1 conceptual framework

Source: Own Compilation (2020)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter covers the research design to be adopted, the population targeted and how the data will be collected and analyzed.

3.2 Research design

A research design is a general plan for implementation of the research strategy according to Kombo and Tromp (2006). The study made use of descriptive research design to realize the supply chain resilience practices effect on the small and medium retail supermarkets performance during the COVID 19 global pandemic. The descriptive research design helped in confirming and describing the characteristics and variables which are being studied. The design provided for the characteristics of a particular situation and it provided for flexibility and accuracy.

3.3 Target population

The licensing department in Nairobi City County places the number of registered small and medium supermarkets to be 53 retail supermarket chains. The 53 retail stores have the largest market share in Nairobi. The study targeted the 53 retail supermarkets in Nairobi, as a result, the study used a census survey method as the entire population was studied as a whole. Nairobi was a suitable choice for the study as it serves the headquarters of most supermarkets. The study targeted supervisors, supermarket workers, and managers to realize the study objectives.

3.4 Data collection

The research used primary data which was attained by the use of closed-ended questionnaires that were developed. The questionnaire consisted of the statements and questions drafted

from the study objectives. The questionnaire was categorized into three categories. Section A consisted of general information, section B was about supply chain resilience practices used by small and medium retail supermarkets in Nairobi to counter COVID 19 pandemic and section C consisted of the relationship between supply chain resilience practices adopted and retail performance outcomes in small and medium retail supermarkets. The questionnaire had closed-ended questions to enable ease of analysis and to provide the researcher with an opportunity to obtain an in-depth response from their respondents. The questionnaires were issued through a drop and pick later mode. The targeted respondents were top management, operation managers, supervisors and supply chain officials.

3.5 Data analysis

The quantitative data obtained from respondents was coded, and analyzed by statistical package for social sciences (SPSS). Descriptive analysis was used in the analysis of the first objective by applying measures of central tendencies. The study's findings were to be presented by the use of frequency tables and tabulation of percentages. Objective two was analyzed by use of correlation and regression analysis where supply chain resilience practices were the independent variable and supply chain performance in small and medium retail supermarkets as the dependent variable. Regression analysis was used to establish the relationship between supply chain resilience practices in small and medium retail supermarkets and supply chain performance during the COVID 19 global pandemic. The regression model that was used for data analysis was:

$$Y = a + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \varepsilon$$

Where:

Y=supply chain performance

A= constant

b1= regression weights attached to the variable constants

X₁= risk management

X₂= strategic collaboration

X₃= supply chain reengineering

X₄= agile

e= standard error term

CHAPTER FOUR

DATA ANALYSIS FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter provides for the data analysis of outcomes, interpretation and subsequent discussion of findings. The chapter will be about the analysis and interpretation of the background information, adoption of resilience practices in the supply chain and regression analysis indicating the relationship that exists between supply chain resilience practices adoption and the performance of supermarkets in Nairobi County, Kenya.

4.2 Response rate

Questionnaires were the primary instruments used to obtain quantitative data from the 53 small and medium retailers in Nairobi. 53 questionnaires were issued one for each entity, however, 45 were completed and returned, which represented 84.90% of the respondents. This rate of response is deemed to be significant according to Yin (2017), who notes that a rate of response that is above 70% is deemed to be sufficient to be analyzed, presented and findings interpreted in any given study.

4.3 General information

This was derived based on the position of the respondent's, years the retailer has been in operation and the most appropriate resilience practice adopted by the organization. The respondents were requested to state their positions and the period their organizations have been in operations and their responses are shown in table 4.1.

Table 4. 1: General information

Job title	Frequency	Percentage (%)
warehouse manager	11	24.4
Supervisor	12	26.7
logistics manager	13	28.9
operations manager	9	20.0
Period in operation (years)		
less than 1 year	5	11.1
1-5 years	11	24.4
6-10 years	16	35.6
over 10 years	13	28.9
Total	45	100.0

Source: Research data (2020)

The results show that 24% of the respondents were warehouse managers, 26.7% were supervisors in retail stores, 28.9% were logistics managers and 20% were operations managers. The research findings conclude that the respondents of the study were properly-suited to provide information which is reliable as they bear significant knowledge on the area of study.

Furthermore, the findings indicate that only 5% of the organisations have been in operation for less than a year, 24.4% of the retailers have been in operation in Nairobi for a period of between one to five years, 35.6% of the supermarkets have operated in Nairobi for a period of six to ten years and 28.9% of the organisations have been in operation in Nairobi for over ten years. The retail units in operation were determined to be qualified to give information that is deemed reliable and relevant to enable the study to realise the study objectives.

4.3.1 Supply chain resilience practices adopted

The respondents were asked to indicate the supply chain resilience practices their organisations adopted. Their response is as indicated in table 4.2.

Table 4. 2: Supply chain resilience practices adopted

Practice	Frequency	Percentage (%)
Agile	13	28.9
strategic collaboration	15	33.3
risk management culture	7	15.6
supply chain reengineering	10	22.2
Total	45	100.0

Source: Research data (2020)

The findings indicate 28.9% of the organisations adopted the agile resilience practice, 33.3% adopted strategic collaboration as their resilience practice, 15.6% adopted risk management culture and 22.2% adopted supply chain reengineering to be their supply chain resilience practice to counter the demand and supply shocks caused by COVID 19. This illustrates that organisations studied practices supply chain resilience to counter the unforeseen COVID 19 disruption. This is consistent with Forkmann et al. (2016) study that established that entities make use of supply chain resilience practices to counter complexity in the supply chain function, emerging risks and uncertainty and technological revolution.

The outcome of this objective is supported by strategic choice theory in that management adopts various practices in the different retail organisations to manage the unprecedented supply and demand shocks caused by the global pandemic. The strategic choice theory believes that different organisations will make use of different practices which strategically fit their objectives to better realise their objectives. The theory tries to explain why a majority of the organisations used strategic collaboration, agile is used to a high extent, supply chain reengineering was used by a significant number of retailers while risk management culture was adopted by a limited number of retailers in Nairobi County, Kenya.

4.4 Extent of adoption of supply chain resilience practices

The research was seeking to determine the supply chain resilience practices adopted by supermarkets in Nairobi. The study subjects are to rank the adoption based on a scale of 1 to

5, where 1= to a very small extent, 2= to a small extent, 3= to a medium extent, 4=to a large extent and 5=to a very large extent. The following subsequent categories will present resilience practices that were categorised into the risk management culture, strategic collaboration, supply chain reengineering and agile. The tables below provide the findings.

4.4.1 Risk management culture

The respondents were implored to rate their retail organisations' adoption of risk management culture on a Likert scale. Table 4.3 shows their response.

Table 4. 3: Risk management culture

Risk management culture	Mean	Std. Deviation
The culture of risk management has enhanced risk identification and reduction	4.0000	1.15470
Improved performance as a result of risk delegation, risk avoidance and risk-taking culture	3.8571	.89974
Continuous improvement initiatives are based on the risk management culture	3.7143	.75593
Risk management has enhanced the identification and maintenance of a risk register for effective risk management	3.5714	.97590
The staff anticipates future risks in the organization and institute measures to identify and manage the risks	3.5714	.97590
Overall score	3.74284	0.952434

Source: Research data (2020)

The overall mean($M=3.74$, $SD=0.95$),illustrated most of the respondents significantly agreed that their retail entity adopted risk management culture to counter COVID 19 disruption implying the practice was adopted to a high extent. The study finding ($M=4.0$, $SD=1.15$) showed the culture of risk management has enhanced risk identification and reduction have been adopted to a very high extent. The finding ($M=3.85$, $SD=0.89$), showed improved performance as a result of risk delegation, risk avoidance and risk-taking culture practice were used to a high extent. The finding ($M=3.71$, $SD=0.97$) illustrated that the continuous improvement initiatives are based on the risk management culture was adopted to a high extent. The finding ($M=3.57$, $SD=0.97$), illustrated the staff anticipation of future risks in organization and institute measures to identify and manage risks was used to a high extent.

The study finding ($M=3.57$, $SD=0.97$) showed risk management has enhanced the identification and maintenance of risk register for effective risk management were also adopted to a high extent.

The findings are concurrent to the ones undertaken by Liu et al. (2018), who undertook a study on the liner shipping industry’s organization performance, resilience in their supply chains and policies in their management. The researcher noted that risk management bears an affirmative impact on the performance of an entity and management is advised to invest in risk management so as to realize their supply chains performance values. The research outcomes were also concurrent with the research undertaken by Flori and Leoni, (2017), which ascertained companies that had instituted enterprise risk management, had a high performance as they were limited to risk exposure.

4.4.2 Strategic collaboration

The respondents were implored to rate the adoption of strategic collaboration on a Likert scale. The table below shows their response.

Table 4. 4: strategic collaboration

Strategic collaboration	Mean	Std. Deviation
Collaboration with the state has enabled enforcement of curfew rules stores close on time	3.8000	1.01419
Open communication channels with employees have reinforced the sense of the fight against COVID 19 as a responsibility of all employees	3.7333	1.22280
Open communication lines with suppliers resulted in quick adaptation to the changes in the availability of supplier to deliver	3.6667	1.17514
Maintenance of a good relationship has encouraged the flow of feedback between the organization and the suppliers	3.6000	1.29835
Collaboration with competitors has provided for the management of stock of essential products and manage pricing.	3.4000	1.24212
Overall score	3.64	1.19052

Source: Research data (2020)

The study's overall mean ($M=3.64$, $SD=1.90$), illustrated that most of the study population were in agreement that their supermarkets adopted strategic collaboration as a supply chain resilience practice implying that the practices were used to a medium extent. The mean ($M=3.8$, $SD=1.04$) illustrated Collaboration with the state has enabled enforcement of curfew rules and stores to close on time was adopted to a very large extent. The finding ($M=3.73$, $SD=1.2$) showed Open communication channels with employees have reinforced the sense of the fight against COVID 19 as a responsibility of all employees was adopted to a high extent. The finding ($M=3.66$, $SD=1.17$) illustrated open communication lines with suppliers resulted in a quick adaptation to changes in the availability of suppliers to deliver was adopted to a medium extent. ($M=3.6$, $SD=1.29$) illustrated Maintenance of a good relationship has encouraged the flow of feedback between the organizations and suppliers was adopted to a medium extent. Lastly, ($M=3.40$, $SD=1.24$) showed Collaboration with competitors has provided for the management of stock of essential products and the managing price was adopted to a small extent.

The findings in the study are concurrent to the study undertaken by Wafula and George (2015), who studied the effect of supplier collaborations on an organizations performance. They noted that networking and development of communication channels between an institution and their suppliers improved as a result of strategic collaboration as a result of improving customer service. The research undertaken by Kopfer et al. (2005) sought to determine the effect of performance collaboration between key suppliers, ascertained cooperation bears a significant affirmative effect on the performance of a firm based on their capability in innovation and the firm's financial results.

4.4.3 Supply chain reengineering

The respondents were implored to rate their retailers' use of supply chain reengineering on a Likert scale. The following table 4.5 indicates their responses.

Table 4. 5: supply chain reengineering practices

Supply chain reengineering	Mean	Std. Deviation
Reengineering of the supply chain has created specialization resulting in sustainability of operations	4.1000	.99443
Reengineering of the supply chain has enhanced expertise in the organization	3.8000	.78881
New suppliers have been contracted to provide essential products as a result of disrupted supplies from overseas	3.6000	.96609
Reengineering of the supply chain has reduced the cost of operations by delegating to firms with core competence	3.5000	1.26930
Overall score	3.75	1.0046575

Source: Research data (2020)

The overall average mean ($M=3.75$, $SD=1.1004$) indicated the study respondents were in agreement that the supermarkets adopted supply chain reengineering as a supply chain resilience practice to a very large extent. The mean ($M=4.1$, $SD=0.994$) illustrated reengineering of the supply chain has created specialization resulting in sustainability of operations implying the practice was used to a very large extent. The finding ($M=3.8$, $SD=0.78$) illustrated the reengineering of the supply chain has enhanced expertise in the organization was adopted to a large extent. The finding ($M=3.60$, $SD=0.966$) shows new suppliers have been contracted to provide essential products as a result of the disrupted supplies from overseas, implying the practice was adopted to a large extent. The mean ($M=3.5$, $SD=1.269$) showed Reengineering of the supply chain has reduced the cost of operations by delegating to firms with core competence, implying the practice was used to a large extent.

The findings of the research are in concurrence with the ones in the study undertaken by Zhu et al. (2018), on supply chain reengineering in Tonghui Agricultural cooperative in Inner

magnolia that ascertained the practice resulted in price advantages in the procurement function and efficacy in strategic activities designed. The study by Clark and Hammond, (1997) on reengineering the reordering process to enhance performance in the supply chain demonstrated the potential improvement a firm realizes when they extend the reengineering concept into their supply chains.

4.4.4 Agile

The study respondents ranked adoption of agile as a supply chain resilience practice on a Likert scale. Table 4.6 below indicates their responses.

Table 4. 6: Agile

Agile practices	Mean	Std. Deviation
Minimum number of employees in retail stores at all times to minimize the risk of transmission	4.1538	.80064
The choice to run supermarket as semi-dark stores for online stores as distribution centres to fulfil online orders increasing revenue	3.9231	1.03775
Maximum utilization of delivery vans and distribution centres to reduce cost enabling continuous process flow	3.6923	.85485
Limit the purchase of essential products to regulate demand and provide the essentials to a maximum number of customers	3.5385	1.05003
Identification of products that are uneconomic to offer and only offer them when economies make sense	3.4615	1.12660
Offering huge discounts on non-essential stocks to increase their sales	3.4615	1.05003
Overall score	3.705	0.9866

Source: Research data (2020)

The overall mean ($M=3.705$, $SD=0.9866$), show the study respondents agreed their supermarkets adopted agile as a supply chain resilience practice, illustrating the practice was adopted to a very high extent. The mean ($M=4.15$, $SD=0.80$) illustrated the Minimum number of employees in retail stores at all times to minimise the risk of transmission was adopted to very high extents. The mean ($M=3.92$, $SD=1.03$), showed the choice to run supermarkets as semi-dark stores for online sores distribution centres to fulfil online orders increasing revenue was adopted to a very high extent.

The mean ($M=3.69$, $SD=0.85$) illustrated Maximum utilisation of delivery vans and distribution centres to reduce cost enabling continuous flow was adopted to a very high extent. The finding ($M=3.53$, $SD=1.05$), shows limiting the purchase of essential products to regulate demand and provide essentials to a maximum number of customers was adopted to a very large extent. The finding ($M=3.46$, $SD=1.12$) showed the Identification of products that are uneconomic to offer and only offering them when economies make sense was used to a medium extent. The study finding ($M=3.46$, $SD=1.05$) illustrated that the offering of huge discounts on non-essential stocks to increase their sales was adopted to a medium extent.

The outcome of the research is the same as the one in the study undertaken by Park (2011) examining the impact and flexibility in SME supply chain resilience. The study noted that flexible practices related to supply chain resilience had an affirmative effect on SME performance. In addition, the study on supply chain resilience on Sri Lankan apparel industry's performance and competitive advantage by Abeysekara, Wang and Kuruppuarachchi (2019), ascertained agility bear the greatest influence on the performance of a company and competitive benefits.

4.5 Supply chain resilience practices and performance

To determine the correlation which exists between supply chain resilience practices and performance, a linear regression analysis was used. The outcomes are shown in the sections detailed below.

4.5.1 Supply chain resilience and profit

To be able to determine the correlation between supply chain resilience practices and profit, a regression analysis was used and the outcome is as shown in the tables below. The resilience practices studied are risk management culture (RSK), strategic collaboration (COLL), supply chain reengineering (SCR) and agility (AG).

Table 4. 7: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.858 ^a	.736	.207	.44247

a. Predictors: (Constant), strategic collaboration, Supply chain reengineering, risk management culture, Agile

Source: Research data (2020)

Table 4.7 above table indicates the R square is 0.73 which translates to 73% implying 73% of profit variation can be attributed to supply chain resilience practices. This shows the regression model is relevant statistically.

Table 4. 8: Anova Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.091	4	.273	13.93	.019 ^b
	Residual	.392	2	.196		
	Total	1.482	6			

a. Dependent Variable: profit

b. Predictors: (Constant), COLL, SCR, RSK, AG

Source: Research data (2020)

The value of F statistics value of 13.93 was relevant as shown by the P-value of 0.019 was lower than 0.05, showing the model is relevant and sound. The P-value is below 0.05 which implies the supply chain resilience practices have a relevant relationship with profit in supermarkets.

Table 4. 9: Regression coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	5.893	2.608		1.260	.003
SCR	.480	.532	.459	2.902	.002
AG	.025	.582	.022	2.043	.019
RSK	.508	.869	.362	3.585	.018
COLL	.064	.238	.157	3.270	.012

a. Dependent Variable: profit

Source: Research data (2020)

The findings show supply chain reengineering ($t=2.902$, $P<0.05$), Agile ($t=2.04$, $P<0.05$), risk management culture ($t=3.58$, $P<0.05$) and strategic collaboration ($t=3.27$, $P<0.05$)

(supply chain resilience practices), all bear an affirmative significance with profit as shown by P values which are below 0.05. This means supply chain reengineering, agile, risk management culture and strategic collaboration influence profit in the supermarkets in Nairobi.

The findings tally with the findings of the research by Ji et al. (2020), which ascertained that the adoption of practices of supply chain resilience results in increased profit levels. Subsequently, the study by Li et al. (2017) on financial performance across supply chain resilience dimensions showed that the supply chain resilience dimensions significantly influences performance in a firms finances. The study also ascertained that preparing the supply chain as a resilience measure influences the financial performance of an organization. The findings from the study by Chunsheng et al. (2019) on the supply chain resilience value on flexibility, culture and integration revealed that the financial performance of an organization can be achieved through Supply chain resilience efforts.

4.5.2 Supply chain resilience and reliability

The results of the correlation between supply chain resilience practices and reliability are in the table shown in the tables below

Table 4. 10: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.768 ^a	.702	.629	.52379

a. Predictors: (Constant), strategic collaboration, Supply chain reengineering, Risk management culture, Agile

Source: Research data (2020)

Findings indicated in the above table show the R square as 0.702. The R square translates to 70% which shows that 70% of the reliability is attributed to the use of supply chain resilience practices (strategic collaboration, supply chain reengineering, agile and risk management culture). The model bears statistical relevance.

Table 4. 11: Anova Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.791	4	4.198	4.720	.002 ^b
	Residual	.549	2	.074		
	Total	1.339	6			

a. Dependent Variable: reliability

b. Predictors: (Constant), strategic collaboration, Supply chain reengineering, Risk management culture, Agile

Source: Research data (2020)

The F value of 4.72 is significant as indicated by the P-value of 0.002 that is below 5%, a predictor which illustrates the model is relevant and sound. The P value s below 0.05 showing the supply chain resilience practices have statically relevant relations with reliability and affects the reliability of supermarkets in Nairobi County. This is consistent with the literature reviewed as it shows improved performance may be enhanced by developing reliable means to avail products and services needed by customers despite the prevailing market and business environment.

Table 4. 12: Regression coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.783	3.317		3.236	.003
	SCR	.175	.364	.226	4.481	.013
	AG	.363	.508	.338	2.716	.021
	RSK	.972	.686	.660	1.417	.002
	COLL	.070	.183	.180	3.384	.001

a. Dependent Variable: reliability

Source: Research data (2020)

Findings shown in the above table indicate, supply chain resilience practices (supply chain reengineering ($t= 4.48$, $P< 0.05$), agile ($t=2.71$, $P< 0.05$), risk management culture ($t=1.417$, $P<0.05$) and strategic collaboration ($t=3.38$, $P<0.05$) all have a relevant and affirmative relationship with reliability as shown by the P values that are less than 0.05. This means the supermarkets performance is affected by supply chain reengineering, agile, risk management culture and strategic collaboration.

The study results are concurrent with the outcome of the study undertaken by Dubey et al. (2019), which established supply chain resilience limit the domino effect in the supply chain and enhances fast recovery after supply chain disruptions. The study by Shukor et al. (2020) on the effect of integrating supply chain on manufacturing entities supply chain agility and flexibility, ascertained that integration of the supply chain bears a positive effect on the entity's reliability. Research on supply integration of the supply chain, risks management and flexibility in manufacturing by Chaudhuri, Boer and Taran, (2018) ascertained that internal integration, risk management in the supply chain bear a strong effect on a manufacturer's reliability.

4.5.3 Supply chain resilience and responsiveness

To determine the correlation between supply chain resilience practices and responsiveness a regression analysis was undertaken. The supply chain resilience practices studied are strategic collaboration, supply chain reengineering, agile and risk management culture. The outcomes are shown in the tables that follow.

Table 4. 13: Model summary

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	.937 ^a	.778	.632	.38890

a. Predictors: (Constant), strategic collaboration, Supply chain reengineering, Risk management culture, Agile

Source: Research data (2020)

Based on the above table, the R square is 0.778 which translates to 77.8% of the variation in responsiveness can be linked to the use of supply chain resilience practices. This shows the regression model was relevant statistically.

Table 4. 14: Anova analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.162	4	.540	16.573	.030 ^b
	Residual	.302	2	.151		
	Total	2.464	6			

a. Dependent Variable: responsiveness

b. Predictors: (Constant), strategic collaboration, Supply chain reengineering, Risk management culture, Agile

Source: Research data (2020)

The F value of statistics of 16.57 was relevant as shown by the P-value of 0.030 that is below 0.05, showing the model is relevant and sound. The P-value is below 0.005 implying that supply chain resilience practices bear a statistical and relevant relationship with responsiveness in supermarkets in Nairobi County.

Table 4. 15: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.018	2.463		3.407	.000
	SCR	.268	.270	.255	2.990	.003
	AG	1.221	.377	.837	3.240	.024
	RSK	.207	.509	.104	1.407	.034
	COLL	.263	.136	.496	1.932	.023

a. Dependent Variable: responsiveness

Source: Research data (2020)

Supply chain reengineering ($t=2.99$, $P<0.05$), agile ($t=3.24$, $P<0.05$), risk management culture ($t=1.40$, $P<0.05$) and strategic collaboration ($t=1.93$, $P<0.05$) (Supply chain resilience practices) had relevant and affirmative correlation with responsiveness as their P values were below 0.05. This illustrated that supply chain reengineering, strategic collaboration, agile and risk management culture affects the supermarkets' responsiveness.

The findings are consistent with research undertaken by Fattahi, Govindan, and Keyvanshokoo (2017), which noted when supply chain networks exploit both contingency and mitigation strategies to obtain supply chain resilience because of possible disruptions,

supply chains remain responsive to the needs of their customers as the risks are limited. The study by Sabahi and Parast, (2020) on supply chain resilience and firm innovation indicated that an organization with more innovative environments would be resilient to disruptions as they develop capabilities in collaboration and agility that enhances their flexibility. A study by Sukati et al. (2012) on competitive advantage by the integrating the supply chain to realize responsiveness ascertained integrating the supply chain, which is a supply chain resilience practice, affects affirmatively supply chain responsiveness and a company's competitive advantage.

4.6 Relationship between supply chain resilience practices and overall performance

The research was seeking to ascertain the correlation that existed between supply chain resilience practices adoption and performance. Linear regression was used and the results are as indicated below.

4.6.1 Correlation analysis between supply chain resilience practices and performance

The coefficients of Pierson correlation assumes values range from +1 to-1 where; 0=no relationship and 1= a significant relationship exists between the study variables (Schober, Boer & Schwarte, 2018).

Table 4. 16: Pearson correlation coefficient matrix

Pearson correlation		Supply chain performance	Supply chain resilience
Supply chain performance	Pearson Correlation	1	.840*
	Sig. (2-tailed)		.018
Supply chain resilience	Pearson Correlation	.840*	1
	Sig. (2-tailed)	.018	

Source: Research data (2020)

The study results indicate the existence of a significant correlation between supply chain resilience practices adoption and performance with a value of 0.840. The figure translates to 84%.

4.6.2 Regression analysis of supply chain resilience practices and performance

The summary of the regression model of the research is as presented in table 4.17 below

Table 4. 17: Regression model summary

Mode	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.840 ^a	.705	.646	.15903

a. Predictors: (Constant), supply chain resilience

Source: Research data (2020)

Table 4.17 above indicates the R square is 0.705. This translates to 70%, implying that 70% of the variation in a retail organisations supply chain performance is directly attributed to supply chain resilience practices adopted. It is a good fit as it leaves only 30% of supply chain performance unexplained.

4.6.3 Analysis of variance

To be able to determine the analysis of variance which is used in the determination of the P and F, regression analysis was used. The table below shows the findings.

Table 4. 18: ANOVA analysis

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.428	4	.107	33.539	.003 ^b
Residual	.001	2	.000		
Total	.429	6			

Source: Research data (2020)

The F value of statistics 33.5 is significant as shown by the P-value (0.003), which is below 5%, illustrating a fit and significant regression model. The P-value is below 5% implying that supply chain resilience practices bear a compelling relationship with the supply chain performance in supermarkets in Nairobi. The findings are similar to the one by Hobbs (2020), who ascertained supply chain resilience practices affect the food supply chains performance in the corona virus pandemic period.

4.6.4 Regression coefficients

The coefficients of regression were used in determining the value of supply chain resilience practices, the constant, the t value and p values as indicated below.

Table 4. 19: Coefficients

Model	Unstandardize d Coefficients		Standardize d Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.15 2	.100		11.553	.007
Risk management culture	.620	.033	.822	18.663	.003
Strategic collaboration	.225	.009	1.015	24.630	.002
Supply chain reengineering	.091	.020	.161	4.457	.047
Agile	.173	.022	.284	7.762	.016

Source: Research data (2020)

The linear equation established is as below:

$$Y=1.152+0.620X_1+0.225X_2+0.091X_3+0.173X_4$$

X₁= Risk management culture

X₂= strategic collaboration

X₃= Supply chain reengineering

X₄=Agile

From the table, risk management culture ($\beta=0.620$, $P=0.003 < 0.05$) has an affirmative and significant impact on supply chain performance in supermarkets. Strategic collaboration ($\beta=0.225$, $P=0.002$) bears a positive effect on the supermarkets' supply chain performance. Supply chain reengineering ($\beta=0.91$, $P=0.047 < 0.05$) has an affirmative and significant impact on the supply chain performance of supermarkets. Agile ($\beta=0.173$, $P=0.016 < 0.05$) has an affirmative effect that is significant on supply chain performance in supermarkets.

This model shows that holding all factors constant, a single change in supply chain reengineering unit would result in a 0.091 growth in supply chain performance, one unit

change in agile would result to 0.173 change in performance of the supply chain. A change by a single unit in risk management culture would result to a 0.620 improvement in an entity's supply chain and a single unit change in strategic collaboration would cause a 0.225 growth in supermarkets supply chain performance.

The research findings show supply chain resilience practices have a significant affirmative relationship with supermarkets supply chain performance. The findings are similar to the ones in the study undertaken by Munywoki (2016) on the effect of strategies for managing risks in supply chains on performance of automotive retailers in Nairobi ascertained existence of a positive correlation between the two concepts. In another study, McFadden et al. (2015) studied the influence the food retailers have on the improvement of supply chain resilience across the world. The study ascertained food supply chains across the world are not stable and are prone to disruption, shocks and this can be managed by instilling stakeholder engagement across significantly large areas and alteration of operations. The study findings are in concurrence with one of the studies undertaken by Aigbogun, Ghazali, and Razali (2014), who studied the framework which improves supply chain resilience in the Pharmaceutical industry in Malaysia, ascertained strategic collaboration and agility aids in the reduction of risks of disruption. The findings are in concurrence with the literature review in that retail organization which adopted supply chain resilience practices gained a competitive edge that was reflected in their profit levels, responsiveness and reliability.

The research relies on the dynamic capability theory which gives relevance to the entity's alignment of their abilities, resources and their resources to be able to counter the abrupt change in their business environments, as a result, boosting their competitive edge and improving their performance.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter is about the summary of the study findings, conclusion, study recommendations, subsequent study limitations and future study suggestions

5.2 Summary of the findings

The main aim of the research was to ascertain the supply chain resilience practices adopted by supermarkets in Nairobi County and determine the correlation between supply chain resilience practices and performance in supermarkets in Nairobi County, Kenya. The study findings ascertained that supermarkets in Nairobi County made use of supply chain resilience practices to counter supply and demand shocks to a very significant extent. The resilience practices which were adopted to a very large extent are strategic collaboration, agile, supply chain reengineering and risk management culture. This indicates that the first objective of the study was realized.

Furthermore, the research findings indicate there is an existence of an affirmative correlation between supply chain resilience practices and Nairobi supermarkets performance. This is illustrated by the positive correlation between the dependent variables of profit, responsiveness and reliability and the independent variables made up of strategic collaboration, supply chain reengineering, agile and risk management culture. This shows the second objective of the study was realized. Resilience techniques to be adopted by supermarkets will be based on collaboration by players across the value chain to come up with measures that they will depend on when their operations are disrupted, agility basing on their response time, visibility across the supply chain and formulation the culture of risk mitigation across the value chain as these have a positive effect on their performance.

5.3 Conclusions of the study

Considering findings and the literature reviewed, it is conclusive there exists a compelling relationship between supply chain resilience practices and performance in supermarkets in Nairobi, Kenya. The research, therefore, concludes that the use of supply chain resilience practices affects how organizations supply chain performance to a very large extent. The improvement in supply chain performance is reflected through profit, responsiveness and reliability. This indicates that supply chain resilience practices contribute significantly to the performance of retail stores in Nairobi County, Kenya to counter the supply and demand shocks caused by the unforeseen global pandemic of COVID 19.

5.4 Recommendations of the study

The study recommendation is to all the strategic level managers and middle-level managers in small and medium supermarkets in Nairobi, Kenya and other counties are to increase their investment in and adopt supply chain resilience practices to be able to significantly and positively impact their supply chain performance.

Furthermore, the study recommends an increase in awareness to the impact of supply chain resilience practices on supermarkets performance across the country as this would assist retailers to plan properly for any unforeseen disruptions on a global scale. The study recommends retailers to come up with clear guidelines and policies on supply chain resilience practices they adopt which would guide them during an unforeseen crisis period across the global supply chains to keep them in business.

5.5 Limitations of the study

The research was confined to the use of primary data with no use of secondary data, as questionnaires were the only tool used to collect primary data. They are significant as they provide firsthand information from the source, however, they are faced with several problems

such as the respondents giving false information or declining to give information. In addition, not all questionnaires issued were returned as a good number was not returned based on reasons such as respondents being too busy to participate and presence of company rules barring works to give information about the entity. Moreover, the researcher targeted supply chain managers and at times their roles were delegated to junior employees who were not well informed giving inaccurate information on the questionnaires. The study is limited to the context of small and medium retailers in Nairobi County only and should not be used to generalize other sectors. The quality of the study was not compromised based on the above limitations and further studies are to consider these limitations to avoid misleading and irrelevant information that is the basis of inferential statistics.

5.6 Suggestions for further studies

There exist several other factors apart from the practices adopted for supply chain resilience, which affect performance in supply chains that future researchers are to focus on. Future researchers should also make use the controlling, intervening and moderating variables as this study only relied on the dependent and independent variables. Also, supply chain resilience practices should be studied in the context of the large multinational retailers, wholesale and online models across the other counties apart from Nairobi. The researchers are also to consider the adoption of supply chain resilience practices in other sectors during the crisis period and not the retail industry in their research. There exist other supply chain resilience practices apart from the ones that the study is based on and further research should make considerations for them to be studied.

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APPENDIX I: INTRODUCTION LETTER



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4 November 2020

TO WHOM IT MAY CONCERN

INTRODUCTORY LETTER FOR RESEARCH **BRIAN WAKASALA - REGISTRATION NO.D67/10655/2018**

The above named is a registered Master of Science in Supply Chain Management student at the University of Nairobi, School of Business. He is conducting research on "*Supply Chain Resilience and Performance of Supermarkets in Nairobi County, Kenya*".

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your co-operation will be highly appreciated.

A circular blue stamp from the University of Nairobi, dated 11 NOV 2020, is partially visible behind the signature.
A handwritten signature in black ink, appearing to read 'Mary Kinoti', is written over the stamp.
Prof. Mary Kinoti
Associate Dean, Graduate Business Studies
School of Business

MK/jkm

APPENDIX II: QUESTIONNAIRE

Introduction

Please provide the information required by filling the blanks or ticking against an answer that is most appropriate.

SECTION A: Biographic information

1. Please state the name of the supermarket(optional).....
2. Please state your job title.
 Warehouse manager logistics manager
 Supervisor other (specify).....
 Operations Manager
3. How many years has the supermarket been in operation?
 Less than a year 1-5 years
 6-10 years Over 10 years
4. Tick the most appropriate supply chain resilience practice adopted in the supermarket to counter disruption caused by COVID 19.
 - a) Agility in the supply chain
 - b) Strategic collaboration
 - c) Risk management culture
 - d) Supply chain reengineering

SECTION B: Extent of adoption of supply chain resilience

5. The following are some of the supply chain resilience practices that have been embraced by companies to optimize the performance of the retail industry during the COVID 19 supply chain disruption. Please show the extent your organization has adopted the following Practices. Please rank on a scale of 1-5; (where: 1- to a very small extent, 2- to a small extent, 3- to a medium extent, 4- to a large extent and 5- to a very large extent). Tick where it is appropriate.

Measure	Rating				
	1	2	3	4	5

A. Risk management culture					
Risk management has enhanced the identification and maintenance of a risk register for effective risk management					
The culture of risk management has enhanced risk identification and reduction					
Improved performance as a result of risk delegation, risk avoidance and risk-taking culture					
Continuous improvement initiatives are based on the risk management culture					
The staff anticipates future risks in the organization and institute measures to identify and manage the risks					
B. Strategic collaboration					
Open communication channels with employees have reinforced the sense of the fight against COVID 19 as a responsibility of all employees					
Open communication lines with suppliers resulted in quick adaptation to the changes in the availability of supplier to deliver					
Collaboration with competitors has provided for the management of stock of essential products and manage pricing.					
Collaboration with the state has enabled enforcement of curfew rules stores close on time					
Maintenance of a good relationship has encouraged the flow of feedback between the organization and the suppliers					
C. Supply chain reengineering					
Statement	1	2	3	4	5
Reengineering of the supply chain has enhanced expertise in the organization					
Reengineering of the supply chain has reduced the cost of operations by delegating to firms with core competence					
New suppliers have been contracted to provide essential products as a result of disrupted supplies from overseas					
Reengineering of the supply chain has created specialization resulting in sustainability of operations					

D. Agile					
Statement	1	2	3	4	5
Maximum utilization of delivery vans and distribution centers to reduce cost enabling continuous process flow					
The choice to run supermarket as semi-dark stores for online stores as distribution centers to fulfil online orders increasing revenue					
Minimum number of employees in retail stores at all times to minimize the risk of transmission					
Identification of products that are uneconomic to offer and only offer them when economies make sense					
Limit the purchase of essential products to regulate demand and provide the essentials to a maximum number of customers					
Offering huge discounts on non-essential stocks to increase their sales					

SECTION C: Supply chain performance outcomes from the adoption of supply chain resilience practices in operations of the organization.

6. The following are a number of outcomes in performance that organizations experience after implementation of supply chain resilience practices across their operations. Please show the extent the outcomes your organization has experienced. Please rank on a scale of 1 – 5, (where: 1- strongly disagree, 2- disagree, 3- not sure, 4- agree, 5- strongly agree). Tick where it is appropriate.

Supply chain performance Outcome	Rating				
	1	2	3	4	5
Profit					
Increased profit margin					
Maximizing on new customer trends and priorities					
Increased returns on investment					
Profit from customers being at home by increasing the number of delivery slots					
Reliability					
Timely delivery of services					
Quick response to customer queries					

Reduced queuing time					
Reduced stock-outs					
Responsiveness					
Ensures efficient cost management					
Efficient utilization of resources					
Reduction in the number of defects and returns					
Complaints are handled within a short period					

Others (please specify)

.....
.....
.....

THANK YOU!

APPENDIX III: SMALL AND MEDIUM SUPERMARKETS IN NAIROBI.

1. Acacia Supermarket
2. Bluemart supermarket, Nairobi
3. Chandarana Supermarket
4. Cleanshelf Supermarket
5. Cosby Supermarket, Nairobi
6. DnD Supermarket-Innercore Branch, Umoja, Nairobi
7. Eastmatt Supermarket
8. Easy Mart Supermarket
9. Elipa Supermarket , Nairobi
10. Galmart Supermarket
11. G-Mart Supermarket
12. Home Depo Supermarket
13. Horyal Supermarket, Nairobi
14. Ibrahims Electronics Supermarket
15. Ibrahims Supermarket
16. Jaharis Supermarket
17. Jazeer Supermarket Ltd, Nairobi
18. Jds Supermarket
19. Jeska Supermarket Ltd
20. Jeska Supermarket Ltd, Nairobi
21. Karen Supermarket, Nairobi
22. Karrymart Supermarket
23. Kassmart Supermarket
24. Kenton Supermarket, Nairobi
25. Kibao Supermarket
26. Kimsa Supermarket
27. Leestar Supermarket
28. Maathai Supermarket
29. Maguma Andu Supermarket
30. Marketways supermarket, Nairobi
31. Mesora Supermarket

32. Midas Supermarket
33. Mustard Supermarket, Nairobi
34. Naivas Supermarket
35. Ng`Ororgaa Supermarket
36. Pakmatt Supermarket
37. Quickmart Supermarket
38. Rikana Supermarket
39. Saltes Supermarket
40. Selfridge Supermarkets
41. Seraben Supermarket
42. Skymart Supermarket
43. Society Store Supermarket
44. Stage Mart Supermarket
45. Stop and Shop Supermarket
46. Suntec Supermarket
47. Tumaini Supermarket
48. Tuskys Supermarket
49. Uchumi Supermarket
50. Ukwala Supermarket
51. Vantage Supermarket Ltd, Nairobi
52. Wagon Shopping Limited
53. Waiyaki Way Supermarket

Source: Licensing Department Nairobi City County