

**ANALYSIS OF SUPPLY CHAIN RISK MANAGEMENT ON THE
PERFORMANCE OF SELECTED FOOD MANUFACTURING
FIRMS IN KIAMBU COUNTY, KENYA**

JOSEPH KARIUKI KAMAU

**A RESEARCH PROPOSAL SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
MASTER OF SCIENCE IN PPROCUREMENT AND SUPPLIES
MANAGEMENT DEGREE OF
MOUNT KENYA UNIVERSITY.**

OCTOBER 2024

Declaration and Approval

Declaration by the Student

This research project is my original work and has not been presented for a degree or other award in any other university.

Student Signature:  Date: 26/10/2024...

Joseph Kariuki Kamau

MPSM/2020/62466

Approval by the Supervisor

I affirm that the candidate completed the work described in this project under my supervision.

Supervisor's Signature:  Date: 28/10/2024

Dr. Phelista Njeru

School of Business and Economics



Dedication

I dedicate this work to my loving wife Evelyne and my daughter Halsey for the inspiration they accorded me during my studies.

Acknowledgement

My sincere gratitude my supervisor Dr. Phelista Njeru and the entire Mount Kenya University fraternity who gave me this opportunity to undertake in this research project. I had an opportunity to gain more knowledge about research and publication. I really appreciate.



Abstract

Unmanaged Supply Chain risks may result to huge losses for companies. Over the years many organizations including the food manufacturing companies have suffered due to low or poor risks management. There are numerous sources of risk that can arise either internally within a company or from the external business environment due to increased uncertainty in the business climate and the growing complexity of supply chains, which heightens the likelihood of disruptions. There has been a rising trend of supply chain risks in food manufacturing companies. The primary aim of this study is to investigate supply chain risk management and the performance of food manufacturing firms in Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets. The employees will consist of managing directors, productions and operations managers, procurement managers and logistics managers as the key respondents. Since the population is small a census shall be done. The research approach will entail a descriptive design. A preliminary investigation involving 10 food manufacturing firms in Murang'a County will be carried out to evaluate the reliability and validity of the measuring instruments. The reliability of the study instrument will be assessed using Cronbach's alpha, with a threshold of 0.7 indicating satisfactory reliability. The study will primarily gather quantitative data, which will be analyzed using various statistical methods. Response rates will be determined, and descriptive statistics such as mean, median, standard deviation, and proportions will be computed using Statistical Package for Social Sciences (SPSS) version 28. Both qualitative and quantitative methodologies will be employed to analyze the collected data. Content analysis will be utilized for qualitative data, while descriptive statistics like frequencies, percentages, mean, and standard deviation will be employed for quantitative data. Additionally, inferential statistics such as Pearson Correlation and multiple regression analysis will be conducted to examine relationships between variables. Specifically, the Pearson Correlation coefficient will be utilized to ascertain the associations among variables.

TABLE OF CONTENT

Declaration and Approval

ii

Dedication	iii
Acknowledgement	iv
Abstract	v
TABLE OF CONTENT	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
ABBREVIATIONS AND ACRONYMS	xii
CHAPTER ONE INTRODUCTION	1
1.0 Introduction	1
1.1 Background of the Study	1
1.1.1 Global Perspective of Supply Chain Risk Management	2
1.1.2 Regional Perspective of Supply Chain Risk Management	3
1.1.4 Local Perspective of Supply Chain Risk Management	4
1.1.5 The Kenya Manufacturing Sector	7
1.2 Statement of the Problem	9
1.3 Purpose of the Study	11
1.3.1 Objectives of the Study	11
1.4 Research Questions	11
1.5 Significance of the Study	12

1.6 Scope of the Study	13
1.7 Limitations of the Study	14
1.7.1 The Scope	Error! Bookmark not defined.
1.7.2 The Volume of Data	Error! Bookmark not defined.
1.7.3 Confidentiality	Error! Bookmark not defined.
1.8 Delimitation of the Study	15
1.9 Operational Definition of Key Terms.	15
CHAPTER TWO
17 LITERATURE REVIEW	
..... 17	
2.0 Introduction	17
2.2 Empirical Review	17
2.2.1 Transportation Infrastructure and Supply Chain Risk Management ..	17
2.2.3 Strategic Sourcing and Supply Chain Risk Management	24
2.2.4 Supply Chain Re-engineering and Supply Chain Risk Management .	26
2.3 Theoretical Framework	33
2.3.1 Systems Theory	33
2.3.2 Contingency Theory	35
2.3.3 Strategic Choice Theory	36
2.3.4 Complex Adaptive System	38
2.4 Conceptual Framework	39
2.5 Research Gaps	41

CHAPTER THREE	
44	
RESEARCH METHODOLOGY	
44	
3.0 Introduction	
44	
3.2 Research Design	
44	
3.3 Target Population	45
3.4 Sample and Sampling Technique	46
3.5 Sample Population	47
3.6 Construction of Research Instruments	47
3.7 Validity and Reliability of Research Instruments	48
3.7.1 Pilot Test	50
3.8 Data Collection Methods and Procedure	50
3.9 Data Analysis and Presentation	51
3.10 Ethical Consideration	52
CHAPTER FOUR	
53	
RESULTS AND DISCUSSION	
53	
4.0 Introduction	
53	
4.1 Pilot Results	53
4.2 Response Rate	54
4.3 Demographic and Background characteristics	55
4.4 Descriptive Results.....	57
4.4.1 Descriptive findings on Influence of Logistics Systems	57

4.4.2 Descriptive findings on effects of Operational Flexibility	59
4.4.3 Descriptive findings on Influence of Strategic Sourcing	61
4.4.4 Descriptive findings on Influence of Supply Chain Re-Engineering..	65
4.4.5 Descriptive findings on Performance of food manufacturing firms ...	67
4.5 Inferential Statistics Analysis	70
4.5.1 Correlation Analysis	70
4.5.2 Regression Analysis	73
4.6 Discussion of the Key Findings	76
CHAPTER FIVE	79
SUMMARY, CONCLUSION AND RECOMMENDATIONS	79
5.0 Introduction	79
5.1 Summary of the Findings	79
5.1.1 The influence of logistics systems on the performance of food manufacturing firms	79
5.1.2 The effects of operational flexibility on the performance of food manufacturing firms	79
5.1.4 The influence of supply chain re-engineering on the performance of food manufacturing firms	81
5.2 Conclusion	81
5.3 Recommendations	82
5.3.1 Recommendations Based on the Research Findings	82

5.3.2 Further Research Recommendations	83
--	----

Reference	84
------------------------	-----------

Appendix I: Letter of Introduction	100
.....	100

Appendix II: Consent Form	101
---------------------------------	-----

Informed Consent Form	101
------------------------------------	------------

Appendix III: Questionnaire	104
--	------------

Appendix IV: List of Selected Food Manufacturing Firms in Kiambu County, Kenya	107
---	-----

Appendix VI: Turnitin Report	109
------------------------------------	-----

LIST OF TABLES	v
-----------------------------	----------

Table 3. 1 Target Population	44
------------------------------------	----

Table 3. 2: Sample Size	45
-------------------------------	----

LIST OF FIGURES

Figure 2 1 Conceptual Framework	40
---------------------------------------	----

ABBREVIATIONS AND ACRONYMS

CAS – Complex Adaptive System

GDP - Gross domestic product

GOK – Government of Kenya

KAM – Kenya Association of Manufacturers

KDB - Kenya Dairy Board

KNBS - Kenya National Bureau of Statistics

MTP - Medium Term Plan

PPP - Public-Private Partnerships RBV

- Resource Based View

SCRM – Supply Chain Risk Management SCV

- Supply Chain Vulnerability





CHAPTER ONE INTRODUCTION

1.0 Introduction

This chapter include the study's history, problem statement, aims, research questions, importance, and scope, in that order.

1.1 Background of the Study

Various factors, such as political, economic, technological, environmental, and social aspects, continually impact operations within the food industry, influencing the efficiency, cost, variety, quality, and availability of products. Even when there is an abundance of food that is affordable and diverse, it is individuals' choices that determine the nutritional value of their diets (Sibbel, 2012). This journey includes production, processing, distribution, consumption, and disposal stages. Food reaches consumers through these supply chains, where it systematically moves from producers to end-users, while the money spent by consumers circulates back along the chain to those involved in its production (Agricultural Marketing Service, 2023). Disruptions in the supply chain can greatly complicate enterprises' operational environments, emphasizing the importance of lean and adaptable global operations, particularly in food manufacturing industries, which can have an influence on productivity. Skipper (2019) and Scholten and Fynes (2014) emphasized the increasing intricacy of overseeing global supply chains and aligning with evolving customer demands, thereby highlighting firms' recognition of their susceptibility to external risks. Supply chain resilience is emerging as a critical factor in mitigating risks such as demand fluctuations, forecasting inaccuracies, and supplier inadequacies. As a result, by using

supply chain resilience, industrial organizations may proactively prevent and effectively overcome interruptions.

1.1.1 Global Perspective of Supply Chain Risk Management

The UK emerged as the forerunner in comprehensively studying supply chain risk management within businesses. This pioneering study exposed critical gaps in knowledge and preparedness. Businesses were highly concerned about vulnerabilities, yet research was limited, and general awareness of the issue was lacking. The study concluded with a pressing need for a systematic approach to managing these vulnerabilities throughout the supply chain (Pettit *et al.*, 2013).

Disruptions aren't always negative. Sheffi's research (2015) highlights how they can spark unexpected success stories. For instance, after the 1994 Northridge earthquake, ridership on the Los Angeles Metro skyrocketed by 20 times. Similarly, FedEx seized an opportunity during a UPS strike in 1997 by filling the gap and capturing new customers. Likewise, Dell used the 2002 West Coast port lockout to their advantage, promoting air-freighted LCD monitors instead of bulkier CRTs that relied on sea transportation. These examples showcase how disruptions can be springboards to impress customers, build loyalty, and gain a competitive edge through smart recovery and adaptation to the new market landscape (Pettit *et al.*, 2013).

Historical events of historical significance have illustrated the vulnerability of supply systems to disturbances (Scholten *et al.*, 2014).

1.1.2 Regional Perspective of Supply Chain Risk Management

Africa's business environment is booming and constantly changing (Cawood, 2014). This makes it a magnet for multinational corporations and supply chains eager to expand and explore new opportunities (Cawood, 2014). But

success in Africa isn't guaranteed. The market is fiercely competitive and unpredictable, demanding a deep appreciation for cultural differences, local situations, and how institutions function (Sebitosi, 2015). Businesses entering Africa face a complex web of risks and challenges, including the forces of globalization, the rise of technology and digital documentation, pressure to cut costs due to intense competition, and securing funding for viable projects (Heckroodt, 2016)

To unlock East Africa's full potential, everyone needs to work together. This means extensive partnerships, investments, sharing knowledge, long-term commitments, and a constant focus on improvement. Governments, suppliers, and buyers must collaborate to ensure sustainable progress and build resilient supply chains (Berg *et al.*, 2015).

Unexpected uncertainties cost the region's manufacturers more than \$330 million yearly, and they also cost the government \$67 million in lost tax income (Kihara, 2017). Through effective supply chain management, businesses may reduce waste and deliver goods more quickly. The foundation of SCM is the notion that almost every product that reaches the market is the outcome of the work of numerous companies known as the "seven supply chain." Despite the long history of these supply networks, most businesses have just recently given them a passing glance (Wisner, Tan & Leong, 2014). In today's interconnected global environment, most organizations recognize the potential for experiencing supply chain disruptions. These disruptions can stem from diverse sources, including workforce strikes, adverse weather events, or mechanical failures of transportation vehicles (Blackhurst *et al.*, 2014). Such disruptions encompass unforeseen and unplanned occurrences

that interrupt the typical flow of goods, materials, and/or services (Craighead *et al.*, 2017).

Traditional risk management focuses on identifying and measuring risks, but it struggles with unforeseen events. Supply chain risk management takes a different approach. It acknowledges that some disruptions are inevitable and focuses on proactive strategies. Building on traditional methods like risk assessment and planning, supply chain risk management goes further. It equips organizations to adapt, survive, and even prosper in the face of unexpected challenges and uncertainties (Pettit *et al.*, 2010; Knemeyer *et al.*, 2019)

1.1.4 Local Perspective of Supply Chain Risk Management

Kenya's economic expansion is vulnerable to external disturbances, notably affected by worldwide economic trends, regional stability, security issues, and disruptions in the supply chain due to weather conditions. Internally, the stability of politics and unity within the nation are pivotal factors in bolstering business assurance and maintaining policy continuity. The authorities in Kenya must institute adaptable strategies to promptly address macroeconomic risks and unforeseen disruptions (Republic of Kenya, 2019). Kenya's manufacturing industry hit a snag in 2012. The growth rate dipped to 3.1%, down from 3.4% the year before (ROK, 2015). Several factors were to blame: high production costs, fierce competition from imports, expensive loans, and a drought early in the year.

Since 2007, Kenya has faced numerous interruptions in its supply chains. In their examination titled "supply chain disruption in the Kenya floriculture industry," Guyo *et al.* (2017) pinpointed natural calamities, logistics process structuring, labor union strikes, and operational mechanics as the primary

instigators of these interruptions. To alleviate supply chain interruptions, the study proposed the adoption of thorough business continuity strategies to counteract the impact of natural disasters, the creation of redundant logistical processes, the development of innovative policies to tackle labor union strikes.

In early 2012, Kenya's agriculture sector encountered challenges due to severe frost affecting tea production and delayed onset of the long rains, which hindered agricultural activities (GOK, 2019). The Kenyan Constitution of 2010 gave county governments more control over agriculture. This allows them to work with private companies (PPPs) to improve farming yields and efficiency. There are a number of ways PPPs could be used, such as building better facilities to store and transport food (cold chain infrastructure) and using technology to collect and share data. The idea is that these partnerships would help small businesses that process agricultural products (cottage industries) and teach farmers new skills. However, despite giving counties more responsibility for agriculture, there haven't been many improvements and it seems to be getting worse (ROK, 2019).

Likewise, according to the Kenya National Bureau of Statistics (KNBS, 2019) Economic Survey, the overall number of tourist arrivals in 2017 stood at 1,780,768, showing a slight decrease of 0.3 percent compared to the 2016 figure of 1,785,382. The estimated tourism earnings for 2018 amounted to KSh 96.02 billion, indicating a decrease of 1.92 percent from the KSh 97.90 billion recorded in 2017. Various factors including market uncertainties preceding elections, escalated air travel costs to Kenya, dwindling passenger figures, elevated taxation, and negative international media coverage regarding security issues along the coastal region of Kenya resulted to this

decline. The Kenya Economic Report (2019) proposed that the government should adopt strategies to stimulate growth in the sector. Kenya's plan to strengthen its tourism industry involves a few key things. First, they need to fully enforce the tourism laws set in 2011. They also plan to invest more in infrastructure, improve security for tourists, and build special resort towns as part of their long-term Vision 2030 goals.

Kiambu's food processing firms are integral to Kenya's economy, but recent years have brought forth new threats due to advancements in technology, market speculations, and increasing complexity within the sector. Despite this, a significant portion of food production in the region is directed towards the informal sector. The annual food production in Kiambu is reported to be 108.9 million tonnes, with the majority, 75.5 million tonnes, produced in Githunguri, while the remaining 33.4 million tonnes are produced in the subcounties (Kiambu County Annual Report 2021). For example, raw milk is received by cooperatives and further processed into fresh mala, yogurt, butter, or ghee products. The county hosts 415 registered cooperatives, with 330 of them actively engaged in operations. Milk production in Kiambu involves both small dairy farmers and large herds of dairy cows, often employing zerograzing techniques. However, despite the significant potential, production levels are not optimal, leading to operations falling below peak capacity (Kenya Dairy Board, 2021).

In 2014, following a period of milk scarcity in Kenya due to increased demand, Brookside, alongside other milk processors, invested US\$35 million (Kshs. 3.5 billion) to establish the nation's second milk powder plant. This strategic move aimed to capitalize on the surplus milk volumes during Kenya's peak milk production period, ensuring a stable milk supply for the nation

(Kenya Dairy Board, 2021). While government initiatives focus on sector-wide enhancements, stakeholders within the food production network play a crucial role in influencing transaction costs through supply chain responsiveness. It's recognized that these factors exert varying degrees of influence at different stages of the production network. Consequently, it's crucial to establish the correlation between managing supply chain risks and the performance of production networks among food processors in Kiambu County, Kenya. This is essential for offering potential pathways for future coordination and improvement of performance within the food manufacturing industry.

1.1.5 The Kenya Manufacturing Sector

The volume of the Food market is projected to reach 17,530.00 million kilograms by 2028, with an expected volume growth of 5.7% in 2025. On average, each person is estimated to consume 248.20 kilograms of food products in 2024 (KAM Report, 2023).

The manufacturing sector constitutes 70% of Kenya's GDP, while the building, construction, mining, and quarrying industries collectively make up the remaining 30% (KAM, 2015). Recognizing its importance, Kenya Vision 2030 has highlighted the pivotal role of this sector, emphasizing that achieving a consistent annual GDP growth rate of 10% necessitates a robust manufacturing component. Despite being underutilized, the manufacturing sector holds substantial potential to drive GDP growth and generate employment. Unlike agriculture, which is constrained by land limitations, manufacturing offers significant opportunities for poverty alleviation and job creation (Bigsten et al., 2014; ROK, 2019).

The processing industry has consistently accounted for approximately 10% of the GDP, yet its portion of wage employment has been declining. Targets outlined in the initial Medium Term Plan (MTP) 2008-2012, particularly regarding the sector's GDP contribution and the execution of flagship projects, largely went unmet in pursuit of Vision 2030 goals. The goal of Vision 2030 is to have a competitive, strong, and diverse manufacturing sector that can spur job creation and economic expansion. It has the capacity to diversify the country's economy and provide foreign exchange profits through exports. The sector has only modestly grown in spite of this. Kenya's manufacturing sector is a major contributor to the economy, ranking third in terms of Gross Domestic Product (GDP) and job creation. The government's Vision 2030 plan identifies manufacturing as a key driver of future economic growth. An earlier plan (2008-2012) aimed for a significant boost in manufacturing's contribution to GDP, targeting a 10% annual increase. This growth was expected to come from local, regional, and international markets. The industry is divided into a number of main sub-sectors and has about 3,700 industrial units. The industry, which is mostly agro-based, has low levels of employment, export volumes, value addition, and capacity utilization; these findings can be partially explained by the sector's limited connections with other industries. Only a small part (5%) of Kenya's manufactured goods are involved in skill-intensive industries like pharmaceuticals, with the remainder (95%) consisting of basic products including food, beverages, building materials, and basic chemicals. Kenya's manufacturing sector depends heavily on imports, especially for machinery and raw materials (capital and intermediate goods). This is because these industries are not well-developed within Kenya itself (KAM, 2016). Interestingly, even though they rely heavily

on imports, Kenya still manages to export a quarter (25%) of its goods. However, the passage doesn't tell us exactly how much Kenya contributes to the regional market.

1.2 Statement of the Problem

Food processing companies grapple with various supply chain risks, encompassing logistics, operational flexibility, strategic sourcing, and supply chain reengineering risks, all of which have historically led to substantial losses for these firms. Over the past five years, the 29 selected food manufacturing firms in Kiambu County have encountered dwindling profitability. For example, Kenya Nut Ltd and Jungle Nut company witnessed a decline in profitability from Ksh.2 billion in 2021 to Ksh.1.4 billion in 2022 and from Ksh.10 million in 2021 to Ksh.9.6 million in 2022, translating to 3.5% and 2.8% respectively. Despite this decline, the operational costs for Kenya Nut Ltd rose by 9% and 8% for Jungle Nut, attributed to logistics, strategic sourcing, and operational flexibility risks. These risks can originate from within the company or external business environments, given the uncertain business climate and the intricate nature of supply chains, increasing the likelihood of disruptions. Consequently, risk management is becoming increasingly crucial in supply chain management for food processing firms.

Kenya boasts one of the largest consumer markets in Africa. Household final consumption surged to 76.3 billion U.S. dollars in 2020, a significant rise from 28.2 billion U.S. dollars recorded in 2009. The burgeoning middle class has been a driving force behind the expansion of the retail market and the flourishing of e-commerce activities. Projections indicate that e-commerce revenue is expected to surpass 1.5 billion U.S. dollars in 2021. However,

Kenya still grapples with significant challenges that hinder its ability to reduce vulnerability to internal and external shocks while striving for a more inclusive growth trajectory. Notably, nearly 70 percent of the population lacked the financial means to purchase food in 2019, a concerning trend that has persisted despite the country's robust economic development in recent years (Statista, 2023).

Kiambu County is experiencing rapid urbanization, boasting a population of approximately 2.4 million people. Enterprises involved in food production rely heavily on suppliers for the raw materials essential for their manufacturing processes. It's important to recognize that while financial metrics remain crucial, they are not the sole determinants of success for companies. Factors such as sustainable sourcing, environmental considerations, and community social responsibility obligations are increasingly gaining prominence, particularly in shaping a firm's brand identity (Kiambu County Economic Report, 2023). Moreover, the food manufacturing firms in the county struggle to meet the growing demand due to its high population. This study aims to investigate how logistics systems, operational flexibility, strategic sourcing, and supply chain re-engineering can address the challenges encountered by food processing companies in Kiambu County, Kenya.

1.3 Purpose of the Study

The study seeks to analysis of Supply Chain Risk Management on the Performance of Selected Food Manufacturing Firms in Kiambu County, Kenya

1.3.1 Objectives of the Study

1. To determine the influence of logistics systems on the performance of selected food manufacturing firms in Kiambu County, Kenya.
2. To examine the effects of operational flexibility on the performance of selected food manufacturing firms in Kiambu County, Kenya.
3. To establish the influence of strategic sourcing on the performance of selected food manufacturing firms in Kiambu County, Kenya.
4. To analyze the influence of supply chain re-engineering on the performance of selected food manufacturing firms in Kiambu County, Kenya.

1.4 Research Questions

1. To what extent logistics systems influence the performance of food manufacturing firms in Kiambu County in Kenya?
2. What is the effect of operational flexibility on the performance of selected food manufacturing firms in Kiambu County, Kenya?
3. How strategic sourcing affect the performance of selected food manufacturing firms in Kiambu County, Kenya?
4. What is the effect of supply chain re-engineering on the performance of selected food manufacturing firms in Kiambu County, Kenya?

1.5 Significance of the Study

This research was designed to help purchasing managers in factories. It taught them how to better manage the flow of materials and information throughout their supply chains, especially when faced with unexpected problems. The focused on proactive strategies, where managers address critical issues

beforehand to make their companies and supply chains more adaptable. This allowed them to handle both major disruptions and everyday challenges. In particular, the study emphasized how proactive management builds resilience and why different types of organizations need to have risk mitigation processes in place for their supply chains.

The study translated theoretical concepts into actionable advice, offering practical guidance for managers in manufacturing firms to implement and promote specific risk management strategies. These approaches aimed to develop adaptive capabilities, enabling companies to adequately prepare for, respond to, and recover from disruptions. Such insights empower management to allocate resources efficiently, prioritize tasks, and reduce the supply chain's vulnerability to unforeseen events.

The study enhanced the current body of knowledge concerning strategies for managing supply chain risks, with a specific emphasis on organizational factors and a scientific viewpoint. It extends the ongoing conversation surrounding the mitigation of supply chain disruptions. An examination of existing literature highlights that this topic remains relatively underdeveloped, particularly within developing nations, despite its recognized importance by certain researchers. Consequently, this research served as a valuable resource for local scholars seeking to delve deeper into the realm of supply chain risk management.

This study aims to provide a descriptive analysis of the collaboration between manufacturing firms and government/regulatory bodies.

It shed light on how these interactions work to enhance opportunities for manufacturing firms, including addressing current regulatory challenges, aligning quality standards, and addressing security threats such as terrorism.

By fostering such collaborations, the government aims to realize a 20% contribution of GDP from manufacturing firms, aligning with Kenya Vision 2030. Shareholders benefited from the study findings as they assess managerial strategies and gauge the potential for achieving supply chain resilience in food processing companies to profit optimization.

1.6 Scope of the Study

This research zeroed in on how manufacturing companies, particularly those headquartered in Kenya, can manage risks in their supply chains. By using these techniques, manufacturers can better handle unexpected issues and adapt to changing demands from stakeholders, shareholders, and customers. Some examples of these techniques include redesigning supply chains (reengineering), being flexible in operations, carefully choosing suppliers (strategic sourcing), and being aware of potential risks. It's important to note that the study only looked at manufacturing companies within Kiambu County.

The research focused on manufacturing companies because the Kenyan government, in Vision 2030, recognizes their importance. This national plan aimed to transform Kenya into a powerful, middle-income industrial nation by 2030, able to compete globally and offer its citizens a high standard of living. This focused on manufacturing makes sense because, as seen in many developing economies, this sector is often the key driver of economic growth (KAM, 2015).

1.7 Limitations of the Study

The study experienced various limitations. The researcher conducting the study encountered difficulties due to the extent of the scope. This is because of the large population in the region and the researcher's limited access to

some food production companies, such as Brookside Dairy company, that are situated in restricted regions of Kiambu County. This suggested that not every person in every chosen organization encountered the same hazards in their food supply chain experienced the same circumstances as described in the study's findings. The study's participants motivated to provide higher-quality replies if the boundaries are more strictly defined.

Another problem with the data analysis process is the sheer amount of data that has to be processed. There was a delay in the study's conclusion because there was a lot of data to process. Survey data collection from the vast majority of respondents may need far longer than expected to process. At initially, some of those respondents could have been reluctant to provide the information, expressing concerns that it would be too delicate a topic to address in public. To allay the participants' fears, the researcher assured them that the study's focus would be limited to issues related to academic accountability. Consequently, the researcher upheld the highest level of secrecy about any information that is collected.

1.8 Delimitation of the Study

The researcher obtained the necessary assistance from management involved in research by utilizing the research permission (NACOSTI) and an introduction letter from the school outlining the study's goal.

It was necessary to concentrate more on getting primary data directly from respondents in order to facilitate data analysis within the allotted academic time period.

1.9 Operational Definition of Key Terms.

- Food Supply Chains – This is the processes that describe how food from a farm ends up on the tables. It includes production, processing, distribution, consumption and disposal.
- Logistics Systems - This is the network of companies, individuals, events, information, and assets that are involved in the actual movement of goods from supply to buyer.
- Operational Flexibility – This is the capacity to react to uncertainty in the corporate environment either proactively or reactively.
- Supply Chain Risks – These include risks, vulnerabilities, and exposures related to the goods and services moving through the supply chain as well as risks, vulnerabilities, and exposures related to the supply chain itself.
- Strategic Sourcing - With this sourcing strategy, many tactics are applied during the product or service procurement process.
- Supply Chain Re-Engineering - Organizations use this revolutionary approach to streamline their supply chain processes in order to increase productivity and competitiveness.
- Supplier Selection Criteria - An organization searches for certain metrics, measurements, and essential traits in a possible supplier.
- Supply Chain Mapping – In order to construct a worldwide map of

the company's supply network, this procedure involves capturing information about the businesses, suppliers, and persons engaged in the supply chain

Warehousing

– This is a process of storing goods in a

warehouse for the purpose of distribution, sale, or manufacturing.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The supply chain risk management practices of industrial companies in Kenya's Kiambu County are examined in this research. System theory, contingency theory, strategic decision theory, and complex adaptive theory are some of the ideas that will be examined in the literature study. It will also look at empirical research relevant to many fields of interest and identify gaps in the existing body of literature. In addition, the chapter will provide the conceptual framework that will guide the research and explain the independent variables of supply chain re-engineering, operational flexibility, risk awareness, and strategic sourcing.

2.2 Empirical Review

2.2.1 Transportation Infrastructure and Supply Chain Risk

Management

A study on Big Data Analytics for SMES' Performance Sustainability in PostCovid-19 Kenya was conducted by Musyoka C. & Wanjohi P. (2024). Small and medium-sized enterprises (SMEs) are vital to a country's economy

because they generate income and encourage innovation. They make up 90% of all enterprises and up to half of all jobs worldwide. But as supply chains battle to obtain credit, SMEs frequently have restricted access to credit from suppliers, which is made worse by liquidity issues, declining sales, and defaults. The susceptibility of Smashing is made further more acute by elements like as upfront payments, late fees for credit payments, and ongoing costs in Kenya's post-COVID-19 environment. The purpose of this study was to investigate how data science and big data analytics may support the performance of SMEs. Utilizing concepts from the Complex Adaptive System and Strategic Choice Theory, a descriptive survey approach was used on 287 managers of SMEs in each sub-county in Nairobi as the target population. Interviews were conducted with 260 respondents in total using a stratified sample technique But this study's main goal is to look at supply chain risk management and the productivity of certain food manufacturing companies in Kenya's Kiambu County. The particular goals are to ascertain the influence of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya; investigate the effects of operational flexibility on the performance of food manufacturing firms; and ascertain the impact of logistics systems on the performance of food manufacturing firms. System theory, contingency theory, strategic choice theory, and complex adaptive system theory are the ideas that underpin this investigation. There will be 191 workers from 20 stores and 29 carefully chosen food production companies in Kiambu County, Kenya.

A study by Muoki and Moronge (2021) assert that transport infrastructure is pivotal for streamlined logistics. Highlighting the importance of wellmaintained roads, ports, and airports, they emphasize how accessibility

ensures smooth goods movement, minimizing delays. The interconnected nature of transportation infrastructure enhances overall coordination, facilitating efficient goods flow. This underscores the crucial role of transport infrastructure in achieving effective logistics coordination and a streamlined supply chain. However, the primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

In another study Wasike and Juma (2020) emphasize the critical role of transportation costs in logistics coordination. Well-managed costs directly impact profitability and business competitiveness. Efficient cost management involves optimizing routes, transportation modes, and fuel efficiency, ensuring affordability and accessibility of logistics services. Strategic evaluation and optimization of transportation costs are essential for maintaining a competitive edge and enhancing overall logistics efficiency in a given region. The most effective and practical way to achieve transportation goals is through the use of transport practices, which include reduced costs, prompt transmission of information pertaining to transportation to consumers

and other businesses, enhanced productivity, and the best possible use of corporate resources. Transport's main objective is to transfer the consignments from point A to point B. Effective management of transportation is essential for fair pricing, fulfilling client deadlines and other shipping needs, and serving as a critical strategic connection between supply chain organizations. But this study's main goal is to look at supply chain risk management and the productivity of certain food manufacturing companies in Kenya's Kiambu County. The particular goals are to ascertain the influence of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya; investigate the effects of operational flexibility on the performance of food manufacturing firms; and ascertain the impact of logistics systems on the performance of food manufacturing firms.

System theory, contingency theory, strategic choice theory, and complex adaptive system theory are the ideas that underpin this investigation. There will be 191 workers from 20 stores and 29 carefully chosen food production companies in Kiambu County, Kenya.

According to Collins, M. M., & Patrick, N. (2021), having merchandise on hand benefits the connection more and results in customer satisfaction quickly, which boosts output. Remember that completed items, incomplete goods, and necessary raw materials need safety stock. A vital role for inventories is played by the whole manufacturing chain. It is utterly unbelievable and financially unfeasible for every item's supply to arrive at the exact location and time needed. As a result, it is always necessary to store a certain amount of inventory. When businesses have inventory, a significant number of investments can be avoided. A decrease in population might result in cheaper operating costs, particularly for stock storage costs kept in the

stockroom. But this study's main goal is to look at supply chain risk management and the productivity of certain food manufacturing companies in Kenya's Kiambu County. The particular goals are to ascertain the influence of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya; investigate the effects of operational flexibility on the performance of food manufacturing firms; and ascertain the impact of logistics systems on the performance of food manufacturing firms. System theory, contingency theory, strategic choice theory, and complex adaptive system theory are the ideas that underpin this investigation. There will be 191 workers from 20 stores and 29 carefully chosen food production companies in Kiambu County, Kenya.

2.2.2 Operational flexibility and Supply Chain Risk Management

Focusing on operational flexibility, this passage highlights a company's ability to adapt to changing demands (Erol *et al.*, 2010). Research suggests various strategies to achieve this within Supply Chain Risk Management. The conceptual framework include delaying production decisions (postponement), having a diverse group of suppliers (flexible supply base), adaptable transportation options, versatile workforce arrangements, and the ability to adjust how orders are fulfilled. Proponents argue that delaying decisions, like postponement, allows for greater flexibility and resilience during disruptions. The researcher used descriptive survey design with a target population of 106 respondents. Bulky theory and resource-based review theory were both employed in the study. This study's main goal is to look into the performance of a few chosen food manufacturing companies in Kiambu County, Kenya, and supply chain risk management. The particular goals are to ascertain the influence of supply chain re-engineering on the performance

of food manufacturing firms in Kiambu County, Kenya; investigate the effects of operational flexibility on the performance of food manufacturing firms; and ascertain the impact of logistics systems on the performance of food manufacturing firms. System theory, contingency theory, strategic choice theory, and complex adaptive system theory are the ideas that underpin this investigation. 191 workers from 29 carefully chosen food production companies in Kiambu County, Kenya, as well as 20 outlets, will comprise the study's target population.

As stated by Pettit, Croxton, and Fiksel (2013) flexibility fosters resilience in supply chains by facilitating rapid adaptation during turbulent circumstances.

Furthermore, it simplifies the ability of a supply chain to promptly react and recuperate, a process that can be aided by the presence of contingency measures (redundancy), such as backup solutions. Operational flexibility enables the smoother reallocation of resources, encompassing transportation and labor resources, as highlighted. Utilizing stratified random selection, the researcher selected 86 respondents as the target population. Value theory, size theory, and distribution channel theory were also employed in the study to evaluate the value of flexibility in handling disruptions, such as the usefulness of dual source. This study's main goal is to look into the performance of a few chosen food manufacturing companies in Kiambu County, Kenya, and supply chain risk management. Among the specific goals is figuring out how logistics systems affect food manufacturing companies' success, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain reengineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory,

Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets. According to Jüttner and Maklan (2016), sourcing flexibility is crucial for resilience because it allows switching to cost-effective supply sources, either by selecting the most economical option or by enhancing the company's bargaining power in price negotiations with suppliers. They elaborate that companies frequently utilize this tactic to guarantee the availability of suppliers for delivering top-notch materials as required.

Stress its benefits for lead time reduction, critical path management, and cost minimization as well. Through a conceptual framework, they suggest that supplier flexibility fosters agility and resilience, enhancing the company's response during pivotal moments. In terms of product adaptability, it provides a variety of adjustable goods, allowing for quick changes in product design. Managers play a critical role in developing purchasing strategies that align with and fulfill internal requirements to achieve this goal. However, despite the evident benefits of flexibility in enhancing agility and resilience, excessive product flexibility may result in complexity and challenges in managing all specifications within a single manufacturing plant.

The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya.

The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

2.2.3 Strategic Sourcing and Supply Chain Risk Management

Carla *et al.*, (2014). Deliberately implementing appropriate tactics that expertly balance risk and profit concerns is known as strategic sourcing. The four essential elements of strategic sourcing are as follows: managers may build strong supplier relationships by skillfully managing these elements. These include collaboration, relationships with suppliers, selection of suppliers, and administration of supplier bases. Because supply chain management is based on network theory, risk management requires a networking-oriented strategy. With 78 respondents in the sample, the researcher employed the census sampling approach. Value theory and resource-based review theory were both employed in the study. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

(Christopher & Peck, 2004). Did research on Collaboration among organizations within a supply chain works to fully integrate the network, facilitating a comprehensive approach vital for nurturing supply chain resilience. Collaboration is widely acknowledged in the literature as a crucial factor in bolstering supply chain resilience. At its essence, supply chain collaboration emphasizes the exchange of information and the application of shared knowledge throughout the chain, thereby diminishing uncertainty enhancing visibility and improving operational efficiency and effectiveness, and raising customer service standards. They used census sampling technique with a sample size of 202 respondents. The research also used Value Theory and strategic choice theory. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

2.2.4 Supply Chain Re-engineering and Supply Chain Risk Management

Redesigning a supply chain, also known as re-engineering, involves a comprehensive approach that considers every stage from concept to daily operations (Naim et al., 2000). Waiting for disruptions before building

safeguards is a recipe for disaster (Tomasini & Van Wassenhove, 2009). The key lies in proactive resilience – building preparedness into the supply chain from the start to ensure an efficient response when trouble hits (Ponomarov & Holcomb, 2009). Strong supply chain strategies act like a shield, allowing businesses to maintain operations even during major disruptions (Tang, 2006). This is achieved by minimizing risks and enabling adaptation without compromising the overall stability of the chain (Wieland & Wallenburg, 2012). To achieve this, all participants in the supply chain need a clear understanding of how everything works together (Christopher & Peck, 2004; Ponomarov & Holcomb, 2009) and be on the same page when responding to disruptions (Juttner & Maklan, 2011). It's essentially about building a more robust and collaborative network.

Understanding the ownership structure and existing measures within the supply network is essential in supply mapping. These maps serve as guides for management focus and aid in prioritizing planning efforts (Sheffi & Rice, 2005). They ensure that processes and structures are in place to absorb risks when they occur (Wieland & Wallenburg, 2012). Balancing operational efficiency with the need for redundancy is crucial, as it provides a buffer to facilitate recovery from disruptions (Zsidisin & Wagner, 2010).

This could entail using several suppliers or putting safety stocks in place. It is critical to have a thorough understanding of the cost-benefit trade-offs associated with risk management. Knowing how much, where, and how to hold inventory will help you handle disruptions more effectively and build resilience (Blackhurst et al., 2011). Members in the supply chain must work together to achieve this. Prior research has looked at how well businesses can bounce back from or adjust to supply chain disturbances. The term

"resilience" is frequently used by academics to characterize a firm's capacity to quickly adapt and respond to such disruptions. Peck and Christopher (2004) Several strategies for establishing a resilient supply network involve enhancing communication and comprehension among participants, refining supply chain engineering models, and enhancing the responsiveness of supply chain members. To enhance resilience, Chopra and Sodhi (2004) suggested measures such as enhancing capacity, responsiveness, flexibility, and capabilities, as well as procuring redundant suppliers and consolidating demand. Tang (2006) delineated various tactics that businesses can employ to mitigate supply chain disruptions. Postponement, establishing strategic stockpiles, maintaining a flexible supplier base, alternating between internal and outsourced production, and offering financial incentives to suppliers are among these strategies. These types of tactics are also commonly discussed in industry publications.

A number of proposals have been suggested, including using financial modeling to simulate interruption scenarios, implementing strategic inventory buffers, and enforcing stricter processes with suppliers through more formal contracts and purchase orders that have consequences for delays.

Carla et al. (2014) discovered that a significant portion of supply chain resilience is built through procurement actions. The literature analysis has shown certain intra- and inter-organizational issues that might impact supply chain resilience. Examples of intra-organizational problems include knowledge acquisition, inventory control, product development, and technology integration; examples of inter-organizational obstacles include transportation, supply chain design, and strategic sourcing.

Scholten *et al.* (2014) created a comprehensive framework that illustrates the connection between disaster management procedures and the essential capabilities needed to bolster supply chain resilience in their investigation of factors preceding the enhancement of supply chain resilience through mitigation processes. In order to promote resilience, they argued that management should formally implement procedures to build networks and infrastructures ahead of time. In addition, they emphasized that strengthening supply chain resilience requires an iterative and phased integration of processes and capacities, stressing that building and maintaining resilience is a continuous process rather than an isolated event. As a result of his research, mitigation processes have been identified as crucial preconditions for the growth of supply chain resilience capabilities, which makes it possible to carry out necessary procedures during the stages of readiness, reaction, and recovery. The researcher used A cross-sectional survey design with a target population of 101 respondents. The research also used resource-based theory and distribution channel theory. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191

employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

Giunipero *et al.* (2015) states that, in order to create readiness, this approach includes components like cooperation, inventory control, human resource management, predetermined plans, redundancy, and visibility. Additionally, the study showed that three important performance metrics financial performance, market share, and customer service can be used to measure how well SCRM works overall. These indicators help to quantify the ability to handle supply chain interruptions. A timeline can be used to graphically depict the negative effects that risk events have on an organization and the rate at which it returns to stable conditions. The researcher used descriptive survey design the research also used resource-based theory and theory of constraints. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets. According to Urciuoli, Mohanty, and Hints's (2014) study on energy supply chain resilience, modern oil and gas supply chains have put in place a wide range of contingency plans to minimize disruptions. These tactics include portfolio

diversification, contract flexibility, careful planning of transport capacity, and safety stock maintenance. These firms are faced with a number of security issues, including terrorism, conflicts, and vessel hijackings, which is a form of maritime piracy. The report highlights the European Union's efforts in addressing the shortage of oil and gas resources, which often clash with supply chain strategies. The study proposes that companies could gain advantages from negotiating agreements between buyers and sellers or accessing local supply markets. Additionally, the research recommends that enhancing collaboration with governments would enhance energy firms' capabilities in addressing current shortcomings in regulations, standardization of quality norms, and environmental advocacy led by automotive interest groups. This could potentially be achieved through establishing a PanEuropean business coalition capable of engaging with the European Union. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya.

The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets. Guyo, Kangongo, Bowen, and Ragui (2013) conducted a study in Kenya's floriculture business that identified the main causes of supply chain

interruptions. Natural calamities, labor union activity, logistical process design, and production function mechanics are a few of these. The report makes several recommendations for how to deal with these disruptions: creating comprehensive business continuity plans to lessen the impact of natural disasters on the supply chain; implementing innovative labor union dispute resolution procedures; and providing funding for research aimed at enhancing the robustness and scalability of production function mechanics. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

Juttner and Maklan (2011) uncovered several significant findings in their research endeavor aimed at conceptualizing and empirically exploring the correlation between supply chain resilience (SCRES), supply chain vulnerability (SCV), and supply chain risk management (SCRM). They discovered that knowledge management positively influenced SCRES, while supply chain risk (SCR) positively affected SCV. Moreover, knowledge management and the effect of supply chain risk (SCR) were found to support SCRM by enhancing the supply chain's flexibility, visibility, velocity, and

collaboration capabilities, thereby reducing SCV during disruptive risk scenarios. These advantageous outcomes were evident in both the distribution channels to customers and the upstream supplier networks of the supply chains. The primary aim of this study is to investigate supply chain risk management and the performance of selected food manufacturing firms in Kiambu County, Kenya. The specific objectives include determining how logistics systems impact the performance of food manufacturing firms, examining the effects of operational flexibility on their performance, establishing the influence of strategic sourcing, and analyzing the impact of supply chain re-engineering on the performance of food manufacturing firms in Kiambu County, Kenya. The theories that support this study are System theory, Contingency Theory, Strategic Choice Theory and Complex Adaptive System Theory. The study targets Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets.

2.3 Theoretical Framework

According to Camp (2010), a theory is a web of interconnected definitions, structures, and propositions that offer a formalized comprehension of events by showing how variables relate to one another in an effort to explain and forecast these phenomena. According to Cooper and Schindler (2008), a theory is an organized set of related definitions, concepts, and claims that are meant to explain and forecast reality. Four theories of supply chain resilience are examined in this context, along with the ways in which supply chain management and these ideas interact.

2.3.1 Systems Theory

Supply chain management is a simple and extremely important application of systems theory. Think about the complex network architecture of supply chains, which are made up of linked nodes created by the real, physical movement of items. These networks need to be effectively managed to guarantee the smooth flow of materials from suppliers to production facilities and, eventually, the delivery of completed goods to clients. Accordingly, industrial organizations may be thought of as open systems that are always interacting with and impacted by their external environment (Bertalanffy, 1951; Katz *et al.*, 1978).

Manufacturing companies are open systems that rely on constant external inputs to be in business, thus they need to have access to environmental resources. These businesses use environmental inputs throughout the production of completed goods and services by using raw materials (Frankel *et al.*, 2008; Skipper *et al.*, 2008).

Open systems are dynamic systems that, depending on the industry and a company's position in the supply chain, need varied requirements from the external environment. For instance, semi-finished products are regarded as a downstream input in the manufacturing process, but raw materials are often regarded as an upstream input. These inputs should ideally flow from the environment to the central company in line with the plan, meeting predetermined requirements of quantity and quality, to allow for self-sustenance. However, by interfering with the normal flow of commodities, unforeseen occurrences or disturbances might ruin this perfect working state (Svensson, 2000; Hendricks *et al.*, 2003; Kleindorfer *et al.* of 2005). Volatility characterizes the functioning of an unstable supply chain since it is unable to

maintain operations in the face of interruptions (Sheffi et al., 2015; Blackhurst et al., 2014). This makes a supply chain like that vulnerable to unanticipated circumstances. Effective supply chain risk management, on the other hand, can lessen or even completely stop disruptions. The robustness of the supply chain can be strongly impacted by certain design elements. According to Kathryn et al. (2014), less interaction complexity with high tight coupling results in a different proportion of disruptions and less downstream disturbances than more complicated orders. As a result, Kenyan manufacturing companies may minimize the ways in which different process stages interact with one another, which will decrease interactive complexity and, in turn, the possibility that risk occurrences at their facilities would have an impact on downstream production.

2.3.2 Contingency Theory

According to this viewpoint, there isn't a single set of management guidelines that can effectively lead each firm in all circumstance. Due to their inherent diversity and the unique challenges, they face, organizations necessitate a range of management approaches. According to Wren (2005), contingency theory is among a collection of behavioral theories asserting that there is no singular, optimal method to manage a business, structure an organization, or make decisions. In the late 1960s, a number of contingency techniques appeared at the same time. These theories' proponents said that Frederick Taylor's scientific management theories and Max Weber's bureaucracy were insufficient because they ignored environmental factors and failed to acknowledge that there isn't a single best approach to run an organization (Azjen, 2005). As a result, contingency variables include a wide range of variables, including individual variations, technology, organization size, and

environmental uncertainty. These factors shape and affect how people behave in specific contexts when running manufacturing companies. Contingency theory highlights how important it is to match an organization's actions, organizational structure, and processes, procedures, and practices with its current state and aspirations (including strategy, culture, goals, technology, personnel, and external environment) (Purcel et al., 2007). As such, in order to achieve their goals, businesses must create a variety of strategies because one approach may not be sufficient because of external factors.

Contingency theory suggests that management understanding is acquired through exposure to diverse case scenarios, where the most effective approach is determined by the specific circumstances, rather than relying on a universal principle applicable to all aspects of firm management (Wren, 2005). This assertion holds true as various manufacturing companies encounter distinct challenges. For instance, one company might grapple with material shortages, while another contends with labor strikes or slowdowns. Consequently, multiple approaches may be employed to address these challenges. This concept holds significance for manufacturing firms as it necessitates managers to employ diverse managerial methods to establish Supply Chain Resilience (SCRES) within manufacturing operations. For instance, supply chain disruptions encompass external threats such as economic downturns and internal issues like fires at major manufacturing facilities. Manufacturing managers should put established backup plans into action in order to react fast and take the necessary mitigating actions. This will help the company recover more rapidly by reducing the negative effects of disruptions.

2.3.3 Strategic Choice Theory

According to Child's 1972 introduction and refinement of Strategic Choice Theory (SCT), firms strive for higher performance levels and increased efficiency while keeping costs down. To succeed in Kenya, manufacturing companies need to give priority to contextual variables. Managers who adopt contemporary risk analysis technologies and make well-informed decisions for their firms have the potential to improve resilience.

The outcomes of an organization are significantly impacted by the strategic decisions made within it. This was emphasized by Child (1972), who established the theoretical groundwork for this idea in his seminal work on strategic choice. According to Child, the main focus of Strategic Choice Theory is on the political dynamics and governance structures of organizations rather than their operational mechanics. In order to achieve organizational goals, managers are thus urged to carry out structural changes, manage external variables, and choose relevant performance measures. SCT holds that managers have a great deal of control over organizational outcomes since they make decisions and bring about changes inside the company (Child, 1972; Ketchen & Hult, 2007).

The three levels at which strategic decisions are made are individual decisions at the bottom, functional decisions at the middle tier, and strategic planning at the top, according to Kochan, Katz, and McKersie (1986). According to the Strategic Choice Theory, managers are proactive downstream decisionmakers who are primarily in charge of spearheading significant decisions and organizational transformation projects. What Child (1972) refers to as "variation in organizational structure" is driven by three contextual factors: technology, organizational scale, and environmental variables.

This idea is applicable to the study since managers' decisions have a significant impact on how the organization performs. Managers in manufacturing organizations should therefore promote a culture of continuous commitment to communication and cooperation between various departments and organizational levels. This can be achieved by involving employees from different departments, supply chain partners, and organizational tiers in strategic planning processes. They should prioritize increasing risk awareness through training and educational initiatives in order to begin the process of enhancing resilience (Scholten *et al.*, 2014).

Manufacturing company managers should also strive to build strong relationships with their suppliers and make well-informed judgments. Carla *et al.* (2014) state that supply chain design, configuration, or re-engineering processes may be optimized, complexity can be decreased, and flow alignment can be improved across the chain with the use of strategic sourcing strategies.

2.3.4 Complex Adaptive System

A network of linked agents that dynamically adjusts to changes in the external environment and the agent system within it makes up a Complexity Adaptive System (CAS). For example, Kenyan manufacturing enterprises operate in a dynamic environment characterized by frequent interruptions, yet they nevertheless have to prosper in this setting. Because of this, the operational environment of these industrial companies is a mix of chaos and order, with complex nonlinear systems attempting to balance extreme instability and stability (Wycisk, McKelvey & Hülsmann, 2008).

According to Holland (1995) and Choi, Dooley, and Rungtusanatham (2001), a CAS is a system that gradually transforms via mechanisms of adaptation

and self-organization into a cohesive structure over time. Adaptation in a CAS refers to the agents' or components' responsiveness, adaptability, responsiveness, and oftentimes proactiveness in responding to inputs from other agents' or components' that effect it. For manufacturing companies to succeed in these systems, they must thus be proactive, show flexibility, reorganize their organizational structures, and make strategic decisions.

The components of a Complexity Adaptive System (CAS) obey ordergenerating principles, or schemas (McCarthy 2003; Pathak *et al.* 2007; Hasgall, 2013) to ascertain the responses of the CAS throughout the adaptation phase. The CAS environment is dynamic and rugged, and CAS agents must adjust quickly to fit in with the environment. As a result of coevolution, during adaptation to the CAS and its surroundings, new modifications might appear that call for learning and schema modifications to improve fitness. Furthermore, a CAS affects and modifies its surrounds, and the environment's entities pick up knowledge from the system's actions. Events might have disproportionately favorable or unfavorable outcomes. According to Urry (2005), this erratic cause-and-effect connection in CAS events is known as non-linearity.

This can be explained by the fact that the supply chain is intricate and sometimes operates outside the direct view and control of any central business. Therefore, managers need to become more adaptable in order to foster collaboration with other manufacturing businesses as well as stakeholders like suppliers, consumers, and governmental agencies. Manufacturing businesses' desire to strengthen their resilience through selforganization processes makes supply chain risk management a collaborative effort.

2.4 Conceptual Framework

Two essential terms for research are defined in this passage: variable and conceptual framework. According to Ordho (2008), a conceptual framework is simply a visual model that shows the connections between the many objects (variables) under study in the study. Kothari (2009) states that these variables can be any concept that can have several values, such as height, weight, or even wealth in a research study. This study examines how certain variables affect supply chain resilience in Kenyan manufacturing companies using a conceptual framework. According to Ordho (2008), the framework is a diagram that illustrates the connections between various elements (variables). Mugenda (2008) defines variables as quantifiable features that can take on multiple values. Strategic sourcing, supply chain re-engineering, operational flexibility, and risk awareness are the elements that influence resilience in this study. Supply chain resilience itself is the dependent variable because it is the result that the research is attempting to explain. These factors were selected in accordance with pertinent theories and current body of knowledge to carry out research on Kenyan food manufacturing companies' performance in supply chain risk management. Kiambu County.

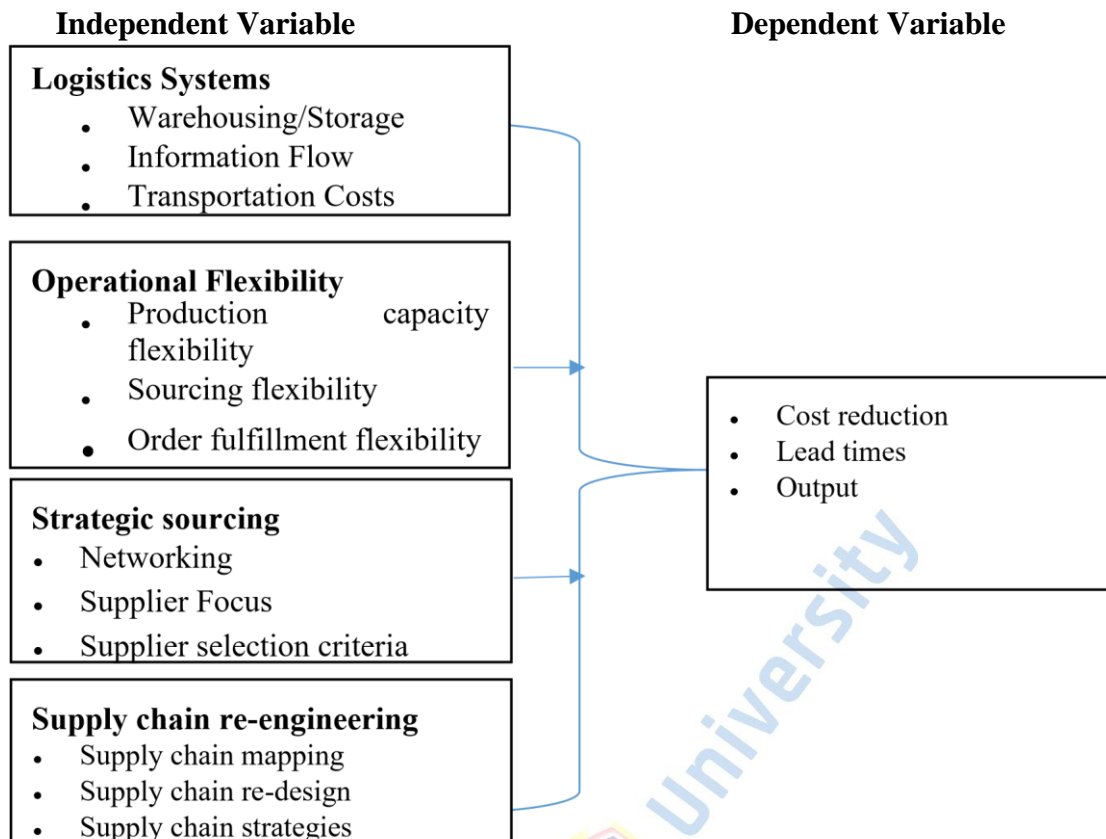


Figure 2 1 Conceptual Framework

2.5 Research Gaps

The lack of sufficient empirical research on SCRM highlights a significant knowledge gap, indicating an incomplete understanding of how SCRM operates in real-world scenarios. The implementation of theoretical propositions may not align with practical outcomes (Benjamin *et al.*, 2015). Moreover, most supply chain resilience studies have been conducted in industrialized nations, yet it is plausible that developing countries have suffered more from supply chain failures, particularly in terms of human casualties. For instance, compared to wealthier nations, the penetration of counterfeit medications into the pharmaceutical supply chain has happened more frequently in poorer nations and has resulted in more serious effects (Chika *et al.*, 2011). Furthermore, political instability—including violent occurrences and upheavals after elections as well as common problems like

bribery, corruption, and unethical corporate practices provide unique supply chain risks for poor nations (Transparency International, 2013). Additionally, variations in economic structures and cultural contexts between developed and developing nations imply that these environments may perceive and respond to threats differently. Furthermore, differing levels of economic development and infrastructure standards, such as transportation networks, suggest that certain disruptions may impact emerging economies more severely than their more developed counterparts. Therefore, exploring how SCRM challenges are addressed in developing countries represents a crucial area for future investigation (Benjamin *et al.*, 2015).

Furthermore, political instability (such as uprisings and violent occurrences after elections), bribery, corruption, and other unethical corporate practices are among the specific supply chain vulnerabilities that developing nations are particularly exposed to (Transparency International, 2013).

Again, it is possible that industrialized and developing nations would perceive threats and react to them differently due to the variations in their economies and cultures.

In contrast, because of differences in economic growth and the caliber of infrastructure, such as rail and road networks, certain emerging nations may be more susceptible to specific disruptions than their more established counterparts. Therefore, it is imperative to conduct future studies on how SCRM challenges are addressed in underdeveloped nations (Benjamin *et al.*, 2015). The resource-based view (RBV) traditionally focuses on internal resources within a company and does not extend to the firm level. However, SCRM differs in that it is a systemic issue affecting inter-organizational connections within a supply chain. Additionally, while RBV relies on

circumstances that are relatively predictable and permit the future valuation of resources, SCRM exhibits emergent characteristics as it responds to a nonlinear, dynamic, and unpredictable environment (Benjamin *et al.*, 2015; Kraaijenbrink, Spender & Groen, 2010). Moreover, the majority of findings derived from the literature review were qualitative, indicating a lack of quantitative methods to validate and support theoretical concepts.

In Kenyan manufacturing enterprises, supply chain resilience is still a relatively new idea and does not yet have a defined framework for building strong supply chain resilience. The majority of supply chain resilience research has been carried out in developed countries (Pereira *et al.*, 2014; Benjamin *et al.*, 2015). Different viewpoints and responses to dangers may arise between industrialized and developing countries due to differences in culture and economic standing. According to Benjamin *et al.* (2015), supply chain resilience is becoming a major problem in developing countries, hence more research is required.

To improve performance, manufacturing companies must make investments in better inventory stock-taking procedures. Focus should be placed on improving the stock chronicle rules and strategies, developing new increase registers for stocks, conducting spot checks, conducting consistent audits, entering records found in automated frameworks, taking stock comparisons, documenting every product in the store by implementing scanner tag numbers that barcode all new stock, verifying issues before distributing stock, and storing supply reports in a secure location accessible only to authorized staff (Collins, M. M., & Patrick, N. 2021).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter offers a thorough description of the research methodology that will be used. There are sections on the population, sampling frame, sample and sampling technique, instruments, data collecting procedure, data processing, pilot test, and measurement variables.

3.1 Research Methodology

The term "research methodology" refers to the particular steps or processes that are used to find, choose, process, and assess relevant material. In the methodology section of a research report, the reader is given the chance to assess the general validity and reliability of an inquiry (Kothari, 2008).

3.2 Research Design

A research design is a detailed plan outlining how a study will be conducted based on the information required to effectively examine the research questions. It also acts as a framework that guides the gathering and examination of data. It is an explanation of the structure, plan, and tactics of the inquiry with the goal of gathering data or responding to a range of inquiries

(Mugenda & Mugenda, 2003). The research design is the structure used to gather, measure, and analyze data (Cooper & Schindler, 2011; Kothari, 2009).

Cooper and Schindler (2011) claim that by outlining crucial methodological choices, study design assists the researcher in allocating limited resources.

But Kothari (2009) makes it clear that the design is a synopsis of the researcher's intended actions, from formulating a hypothesis and considering its operational ramifications to doing the final data analysis.

For this study, a cross-sectional survey design with both quantitative and qualitative methodologies was employed. In a quantitative approach, measurement is prioritized, and data is numerically evaluated to provide accurate descriptions. The scientific method, also referred to as the qualitative approach, historically was regarded as the conventional style of inquiry in both research and evaluation, according to Mugenda and Mugenda (2003).

Berg (2001) the application of common terms or phrases in qualitative research facilitates the methodical examination of data to draw meaningful conclusions and make recommendations about the social circumstances in which certain qualities are present, as well as the individuals who display them. Conversely, a cross-sectional survey design made it easier to collect data for the research at the same time. (Kothari, 2004). As a result, this design is suitable.

3.3 Location of the Study

The study targets Population was 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets. The employees consisted of managing directors, productions and operations managers, procurement managers and logistics managers as the key respondents.

3.4 Target Population

For this inquiry, a cross-sectional survey design with both quantitative and qualitative methodologies was employed. In a quantitative approach, measurement is prioritized, and data was numerically evaluated to provide accurate descriptions. The study targeted Population will be 191 employees from 29 selected food manufacturing firms in Kiambu County, Kenya and 20 outlets. The employees consisted of managing directors, productions and operations managers, procurement managers and logistics managers as the key respondents. Since the population is small a census was done.

Table 3. 1 Target Population

Category	Target	Population Percentage (%)
Managing Directors	49	25.65
Production & Operations Managers	48	25.14
Procurement Managers	49	25.65
Logistics Manager	45	23.56
Total	191	100

Source; Research 2024

3.5. Sample and Sampling Technique

A sample is a subset or segment of the target population. Using the characteristics of the sample, sampling was intended to provide insight into certain aspects or attributes of the entire population. The research employed

census sampling methodology. Cooper and Schindler (2006) state that a nonzero probability of selection is required for each sample.

3.6 Sample Population

Wilson (2003) came to the conclusion that a sample is an in-group of people drawn from the populace. In descriptive research, sample dimensions ranging from 10% to 50% were considered appropriate (Goswami, 2015). The Krecjier and Morgan table was used to obtain the 172 sample for this study. The target demographic as a whole was represented by this. With a non-zero selection probability of 0.101, the sample size was determined to be 0.101. This was a result of a sample size of 20 stores and 29 food production companies.

Table 3. 2: Sample Size

Category	Target Population	Sample Percentage	
		size	(%)
Managing Directors	49	44	25.58
Production & Operations Managers	48	44	25.58
Procurement Managers	49	44	25.65
Logistics Manager	45	40	23.56
Total	191	172	100

Source; Research 2024

3.7. Construction of Research Instruments

To collect data on the independent variables and the different variables under investigation, a standardized questionnaire was created. According to Mugenda & Mugenda (2003), a questionnaire is a research tool used to collect data from a large sample. Its goal is to translate the study objectives into particular questions, and the responses to each question offer the data needed to test hypotheses. A questionnaire had several benefits over other tools, such as the ability to gather data from large samples, the protection of anonymity, and the lack of bias because the data is given on paper. There were two sections to the questionnaire.

Data on the organization was in Part A. In Part B, participants asked to share details on the main topics of this investigation. The poll included both closed-ended and open-ended items. Closed-ended questions were intended to offer precise information, lessen information bias, and make data analysis easier, but open-ended questions let respondents express themselves freely.

3.8 Validity and Reliability of Research Instruments

In this study, the internal consistency approach was employed. Bollen (1989) defined dependability as the capacity of a measurement to remain stable under a variety of conditions while producing roughly the same results. Since the internal consistency method appears to be more stable than the other approaches, it used (Bryman, 2012; Cooper & Schindler, 2011). Researcher used the Cronbach's alpha statistic to verify internal consistency. According to Drost (2011), estimations of reliability for a test should be based on the average intercorrelations between each individual item in the test in order for

it to be considered internally consistent. When using Cronbach's Alpha coefficient for a reliability test, Pallant (2010) recommends that the result be more than 0.7. To compute Cronbach's alpha (α), the researcher followed these steps:

α is equal to $K / (K - 1) [1 - (\sigma_{\text{total}}^2) / \sum \sigma_k^2]$ -----

Formula (1) where K is the number of items, σ_{total}^2 is the variation of scores on the entire measurement, and $\sum \sigma_k^2$ is the sum of the k item score variances (Cronbach, 2004).

Construct validity was used by the researcher in this study. Validity, as defined by Mugenda & Mugenda (2003), is the degree to which conclusions drawn from the analysis of the data truly represent the phenomena under study. Another definition of validity is the degree to which an instrument measures what it purports to assess (Mugenda, 2008; Bryman, 2012). Consequently, study component meaning is a matter of validity.

Construct validity is the extent to which you were able to operationalize a concept, idea, or behavior (a construct) into a reality that continues to operate (Trochim, 2006). This research also makes advantage of content validity. Bollen (1989) defined content validity as a qualitative type of validity where the analyst assesses whether the measurements clearly define the concept's domain and appropriately represent it. Drost (2012) states that there are two primary methods for assessing content validity: either posing a series of questions about the test or instrument, or consulting judges who are subject matter experts.

By creating a questionnaire and operationalizing it according to the study factors, the content validity was examined. This made sure that each variable's items were adequate and representative of the study's goals and purposes.

Supervisors' and supply chain professionals' expert opinions were also used to confirm the content correctness.

3.8.1 Pilot Test

Cooper and Schindler (2011) state that the goal of a pilot test is to find defects in the equipment and design and to provide stand-ins for the data required to choose a probability sample. The same techniques used for the research or data collection will also be used for the pre-testing of the questionnaire.

Pretest participation should range from 1% to 10% of the target group (Mugenda & Mugenda, 2003). To verify the accuracy and consistency of the measuring tools, the researcher therefore carried out a pilot study involving ten food production companies in Murang'a County. Cronbach alpha will also be used to test the study tool, and a score of 0.7 was considered suitable.



3.9 Data Collection Methods and Procedure

According to Kombo and Tromp (2009), data collection is the process of gathering information to substantiate or confirm a claim. Two research assistants were employed and trained to guarantee high-quality data are acquired, and the respondents self-administered the questionnaire. Supply chain managers answered the surveys. These target participants already know enough about the strategies manufacturing companies are using to develop supply chain risk management, given their crucial position in top management engagement. The first step was to contact manufacturing organizations to ask them to explain supply chain management. The researcher waited for the surveys to be finished once they are sent to the supply chain managers who answered them.

3.10 Data Analysis and Presentation

According to Zikmund et al. (2012), data analysis is the process of using logic to comprehend collected data in order to identify recurring themes and provide an overview of the pertinent information that the study has uncovered. To make acquired data readable for analysis, data processing involves editing, categorizing, and tabulating the information (Kothari, 2009). The quantitative data for this study will be collected using the Statistical Package for Social Sciences (SPSS) version 27, and the response rate was calculated using descriptive statistics such as mean, median, standard deviation, and proportions. The gathered data was analyzed using both qualitative and quantitative methods. Researcher used content analysis to assess qualitative data. Quantitative data was evaluated using descriptive and inferential statistics. The researcher used in descriptive statistics: means, standard deviation, percentages, and frequencies. Pearson correlation and multiple regression analysis are examples of inferential statistics. The link between the variables was determined using the Pearson Correlation coefficient.

The multiple regression model was used to ascertain the impact of the independent factors on the dependent variable.

The multiple regression model displayed below was used in the investigation.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \text{Where:}$$

Y = Dependent variable; Manufacturing firms' performance β_0 = a constant indicating performance level in absence of any independent variables.

Then: β_1 , β_2 , β_3 , β_4 and β_5 are the regression coefficients.

X1= Logistics Systems

X2= Operational Flexibility

X3= Strategic Sourcing

X4= Supply Chain Re-engineering ε =

Error term of the regression

3.11 Ethical Consideration

Ethical values and concerns relating to information gathering were taken into account so as to guarantee that the respondents are not at threat. Privacy of the material gathered was upheld and permission from the contributing organizations and respondents pursued. Approval was also sort from all pertinent institutions including, the researcher sorts a certificate of Ethical Clearance from Mount Kenya University Ethical Review Committee and an authority letter to collect information from Mount Kenya University post graduate school. Additionally, the researcher sorts a research authorization

from the National Commission for Science, Technology and Innovation(NACOSTI).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The study sought to investigate supply chain risk management in manufacturing firms in Kenya. Data analysis results and discussion of major

research findings are presented and discussed in this chapter, with attention paid to how these findings relate to the study's guiding research variables and its stated goals. The data shown here was analyzed using the study's variables and tools. In addition to using descriptive statistics, inferential statistics were employed to check the validity of the hypotheses and help accomplish the study's goals.

4.1 Pilot Results

The assessment of an evaluation method's reliability hinges on its ability to consistently yield similar scores. Utilizing SPSS, we computed the Cronbach's Alpha correlation coefficient to gauge the reliability of the questionnaires utilized in our study. According to Taber (2018), Cronbach's Alpha values surpassing 0.7 are considered sufficient for reliability assessment. Table 4.1 showcases the Cronbach's Alpha values for each variable.

Table 4.1: Cronbach's Alpha for Reliability Assessments

Variable	Number of Items	Cronchachs Alpha value
Logistics Systems	4	0.699
Operational Flexibility	4	0.785
Strategic sourcing	4	0.646
Supply chain re-engineering	4	0.735
Average Alpha	4	0.7085

The reliability test, as depicted in Table 4.1, reveals varying degrees of internal consistency among the evaluated variables. Operational Flexibility emerges as the most reliable construct, with a Cronbach's Alpha value of 0.785, indicating robust consistency among its four items. Conversely, Strategic Sourcing exhibits comparatively weaker internal consistency, falling below the recommended threshold with a value of 0.646. Logistics Systems and Supply Chain Re-engineering both hover around the acceptable threshold, suggesting moderate reliability. With all four independent variables yielding alpha values exceeding 0.7, it signifies that the assessed constructs possess ample credibility to advance into more detailed phases of investigation.

4.2 Response Rate

The data presented in Table 4.2 illustrates the response rate. Out of a total of 191 participants, 161 individuals responded, representing an 85.00% response rate. Conversely, 30 participants did not respond, constituting a 15.00% nonresponse rate. These figures indicate a relatively high level of engagement with the survey, with the majority of participants providing responses. The robust response rate suggests a strong level of interest or investment in the survey's subject matter among the surveyed population.

Table: 4.2 Response Rate:

Response	Frequency	Percentage
Returned Questionnaires	161	85.00
Unreturned Questionnaires	30	15.00

Total	191	100.00
--------------	-----	--------

4.3 Demographic and Background characteristics

Table 4.3 presents the social demographic characteristics of the surveyed population, offering insights into the composition of respondents. The data indicates a slightly higher representation of males, comprising 60.49% of the total, compared to females at 39.51%. Age distribution reveals a diverse range, with the majority falling within the 20-39 years category (49.38%), followed by those below 20 years (30.86%) and above 50 years (19.75%).

Regarding academic qualifications, respondents with Bachelor's degrees form the largest group (50.00%), while postgraduates and diploma holders represent 24.69% and 25.30% respectively. In terms of work experience, the majority of respondents have less than 10 years of experience (44.44%), with similar proportions of individuals having 20-30 years (18.51%) and above 30 years of experience (19.14%). This data underscores a diverse representation across gender, age, educational attainment, and work experience, providing a comprehensive understanding of the demographic composition of respondents.

Table 4.3 Demographic and Background characteristics

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	98	60.49%
Female	63	39.51%

Age

Below 20 years	50	30.86%
20-39 Years	80	49.38%
above 50 years	32	19.75%
Total	161	100.00%

Academic Qualification

Post graduate	40	24.69%
Bachelor degree	81	50.00%
Diploma	40	25.30%
Total	161	100.00%

Work Experience

Below 10 years	71	44.44%
10-20 years	29	17.90%
20-30 years	30	18.51%
above 30 years	31	19.14%
Total	161	100.00%

4.4 Descriptive Results

4.4.1 Descriptive findings on Influence of Logistics Systems

The descriptive findings on Table 4.4.1 presents the influence of logistics systems. The data revealed that a majority of respondents (120)74.1% (Mean: 4.72, Standard deviation:0.91) strongly agreed that influence of warehouses management on the performance of food manufacturing firms. this implies that optimizing warehouse operations could yield substantial benefits for firms in terms of efficiency, cost reduction, and overall performance.

On the statement whether Information Flow has a great impact on the performance of food manufacturing firms, majority of respondents (134)82.7% (Mean: 3.02, Standard Deviation: 0.84). neither agreed nor disagreed with the statement. The implication here is that there is room for improvement in information flow practices within food manufacturing firms. Additionally, a substantial majority of respondents (140)86.41% (Mean: 3.98, Standard Deviation: 0.58) Transportation cost may influence the performance of food manufacturing firms 140(86.41) agree that transportation cost may influence the performance of food manufacturing firms This suggests that firms need to carefully manage transportation costs to remain competitive. Finally, a significant majority of respondents (110) 67.90% (Mean: 3.31, Standard Deviation: 1.47) neither agree or disagree on the assessment of current logistic systems' effectiveness for timely delivery yielded. This implies that there may be opportunities for firms to assess and potentially improve their logistic systems to ensure more reliable and efficient delivery of raw materials and finished products.

Table 4.4 Descriptive findings on Influence of Logistics Systems

Statement	Strongly Disagree		Neutral	Agree	Strongly	Mean Standard
	Disagree (F)	(F)	(F)	(F)	Agree (F)	
	1	2	3	4	5	
Warehouses management						

influence the							
performance	0(0.00)	2(1.23)	0(0.00)	40(24.69)	120(74.07)	4.72	0.91
of food							
manufacturing							
firms							
Information		Flow has a		great impact			
on							
performance	1(0.62)	1(0.62)	134(82.71)	3(1.85)	23(14.19)		
of food						3.02	0.84
manufacturing							
firms							
Transportation							
cost may							
influence the	2(1.23)	5(3.08)	0(0.00)	140(86.41)	15(9.26)	3.98	0.58
performance							
of food							
manufacturing							
firms							
Current		logistic					
systems are							
effective for						3.31	1.47
terms of							
timely	7(4.32)	5(3.08)	110(67.90)	11(6.79)	29(17.90)		
delivery of							
raw materials							

and finished products,

4.4.2 Descriptive findings on effects of Operational Flexibility

The results presented in Table 4.5 provide insights into the perceptions of respondents regarding the effects of operational flexibility within firms. The data reveals that majority of respondents (101) 62.34% (Mean: 4.01, Standard

Deviation: 1.75) agreed that firms possess the capability to acquire goods, materials, or services from various sources as needed. This suggests a positive outlook on the flexibility of firms in managing their supply chains.

Additionally, (100) 61.72% (Mean: 1.88, Standard Deviation: 1.97) of participants disagreed with the statement This highlights the need for firms to assess their order fulfillment processes and identify areas for improvement to better meet customer expectations.

On the statement whether Firms have the ability to adapt to changes in market conditions and customer demands. A majority of the respondents (121)74.69% Mean: 3.55, Standard Deviation: 1.39) agreed that firms have the ability to adapt to changes in market conditions and customer demands. This positive outlook reflects confidence in the adaptive capacity of firms to respond effectively to dynamic business environments.

Table: 4.5 Descriptive findings on effects of Operational Flexibility

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
	(F)	(F)	(F)	(F)	(F)		

1 2 3 4 5

<p>The firms possess the capability to acquire goods, materials, or services from various suppliers, locations, or supply chain</p>	2(1.62)	1(0.62)	24(14.81)	101(62.34)	34(20.98)		4.01	1.75
<p>channels as required. Customer demands and requirements in the fulfillment of orders are affected.</p>	50(30.86)	100(61.72)	0(0.00)	6(3.70)	6(3.70)		1.88	1.97

Firms have the ability to adapt to changes in market conditions and customer demands.	1(0.62)	36(22.22)	1(0.62)	121(74.69)	3(1.85)
---	---------	-----------	---------	------------	---------

4.4.3 Descriptive findings on Influence of Strategic Sourcing

The descriptive findings on the influence of strategic sourcing, as presented in Table 4.4.3, shed light on various aspects of sourcing practices within firms. The data reveals a significance majority of respondents (123)75.9269% Mean: 4.10, Standard Deviation: 1.93) agreed that firms to actively engage with suppliers and industry partners to foster collaborative relationships and networks, as evidenced. This indicated a strength in collaborative efforts within the supply chain to enhance mutual benefits and drive innovation.

Additionally, majority of the respondents (143)88.27% Mean: 3.91, Standard Deviation: 1.56) there is a consensus that firms conduct comprehensive supplier assessments to understand performance, reflected. This indicates a commitment to ensuring quality and reliability within the supply chain. Firms should continue to prioritize supplier assessments to identify strengths, weaknesses, and areas for improvement.

Moreover, a significance majority of respondents (100)61.77% (Mean: 2.48, Standard Deviation: 1.29) agreed on the importance of considering factors such as quality standards, regulatory compliance, and ethical practices when evaluating potential suppliers. This indicates a recognition among respondents of the importance of considering quality standards, regulatory compliance, and ethical practices when evaluating suppliers.

However, the influence of strategic sourcing on firms' competitiveness in the marketplace is perceived to be moderate a majority of respondents (102)62.96% (Mean: 3.58, Standard Deviation: 1.70) disagreed with the statement. These findings emphasize the importance of strategic sourcing practices while also indicating opportunities for firms to refine their strategies and strengthen competitiveness.



Table: 4.6 Descriptive findings on Influence of Strategic Sourcing

Statement	Strongly Disagree (F)	Disagree (F)	Neutral (F)	Agree (F)	Strongly Agree (F)	Mean	Standard Deviation

1 2 3 4

Firms

actively

engage with suppliers

and industry

4.10 1.93

partners to

123(75. 32(19.7

4(2.46 1(0.62) 2(1.23)

build

92) 5)

collaborativ

e

relationships

and

networks

Firms

conduct

143(88.

3.91 1.56

5(3.08) 2(1.23) 3(1.85)

comprehensi

27) 9(5.56)

ve supplier assessments

to understand

performance

,

Factors such

as

quality

standards,

compliance

with

regulations, 3.58 1.70 51(31.4 100(61.
and ethical 1(0.62) 8(4.93) 2(1.23)
8) 72) practices are considered when
evaluating potential suppliers
strategic sourcing
influence 2.48 1.29
102(62. 36(22.2 10(6.17
firms' 5(3.08) 9(5.55)
96) 2)) competitive ness in the
marketplace.

4.4.4 Descriptive findings on Influence of Supply Chain Re-Engineering

The descriptive findings on the influence of supply chain re-engineering, as depicted in Table 4.7, revealed that. A majority of respondents (98)60.49% (Mean: 2.03, Standard Deviation: 1.31) disagreed that Firms utilize supply chain mapping to gain insights into the flow of materials. This implies that Firms should consider investing more resources in understanding and visualizing the flow of materials within their supply chains to identify inefficiencies and opportunities for optimization.

Regarding the engagement of firms in supply chain re-design to meet customer demands and other factors, a majority of the respondents (130)

80.25% (Mean: 3.99, Standard Deviation: 2.44) agreed in the statement. This implied that that firms recognize the necessity of adapting their supply chains to meet evolving customer.

Concerning the influence of supply chain strategies on decision-making processes, a majority of (123)75.92% (Mean: 3.67, Standard Deviation: 2.44) agreed with the statement. This suggests a more nuanced understanding of the impact of supply chain strategies on decision-making processes. While there is general recognition of their importance, there may be varying perspectives on the extent of their influence and effectiveness.

Lastly on the statement whether Supply chain re-engineering impact collaboration and communication among stakeholders a majority of respondents (133)82.09 % (Mean: 3.17, Standard Deviation: 2.04). This implies the significant impact of supply chain strategies on decision-making processes within firms.

Table: 4.7 Descriptive findings on Influence of Supply Chain Re- Engineering

Statement	Strongly Agree (F)	Agree (F)	Neutral (F)	Disagree (F)	Strongly Disagree (F)	Mean	Standard Deviation
Firms utilize supply chain mapping to	31	47	20	5	1	3.17	2.04
Firms utilize supply chain mapping to	39	98	10	12	3	3.99	2.44
Firms utilize supply chain mapping to	39	98	10	12	3	3.67	2.44

gain insights
into the flow
of materials.

Firms 20(12. 5(3.08)) 5(3.08) 130(80.2 1(0.62) 3.99 2.44
engage in 34) 5)

supply chain
re-design to
adapt to
customer
demands and

other factors Supply

4(2.4
7) 10(6.17)
23(14.1
123(7
5.9
2(1.2
3) 3.67
2.44



chain 9) 2) strategies influence decision

making processes

Supply 1(0.62) 2(1.23) 133(82. 20(12.34 6(3.70) 3.17 2.04 chain re- 09)) engineering

impact

collaboratio

n and
communicat
ion among
stakeholders .

4.4.5 Descriptive findings on Performance of food manufacturing firms

The descriptive results from Table 4.8 shed light on several operational aspects of food manufacturing firms. In particular, concerning the implementation of cost reduction initiatives, a significant majority of respondents (120)74.07% (Mean:2.29, Standard Deviation: 2.05) disagreed regarding the implementation of cost reduction initiatives reflects the ongoing focus within food manufacturing firms on operational efficiency and cost optimization

On whether Strategies employed by your firm to enhance lead time efficiency significant majority of respondents (132)81.48 % (Mean:3.19, Standard Deviation: 1.55). agreed that strategies to streamline lead times highlights the significance of efficient supply chain management in food manufacturing operations

Additionally, a majority of respondents (142)87.65% (Mean:4.08, Standard Deviation: 1.77) agreed that recent innovations or improvements that have positively impacted your output levels. This highlights the significance of efficient supply chain management in food manufacturing operations. On whether solicit feedback from customers or stakeholders regarding your performance (122)75.30% (Mean:2.10, Standard Deviation: 0.99) strongly agreed with the statement this implies that solicitation of feedback reflects the

growing recognition of the importance of customer-centric approaches and stakeholder engagement in performance evaluation.

Table: 4.8 Descriptive findings on Performance of food manufacturing firm

Statement	Strongly Agree (F)	Disagree (F)	Strongly Disagree (F)	Mean	Standard Deviation (F)	Neutral	Agree
Cost reduction initiatives undertaken in your food manufacturing processes	10(6.17)	120(74.07)	12(7.40)	15(9.25)	5(3.08)	2.29	2.05
Strategies employed by your firm to enhance lead time efficiency.	1(0.61)	3(1.85)	16(9.87)	132(81.48)	10(6.17)	3.19	1.55
recent innovations	1(0.62)	1(0.62)	0(0.00)	142(87.65)	18(11.11)	4.08	1.77

or
 improvements that have
 positively
 impacted your
 output
 levels
 solicit 23(14.7(4.320) 2(1.23) 8(4.94) 122(75.3 2.10 0.99
 feedback 19) 0)
 from
 customers or
 stakeholders
 regarding
 your
 performance

4.5 Inferential Statistics Analysis

This section centers on the statistical inference of the study, highlighting the utilization of Pearson Correlation and multiple regression analysis as inferential statistical techniques.

4.5.1 Correlation Analysis

Pearson Correlation coefficient will be utilized to ascertain the relationship between variables, while the multiple regression model will be employed to assess the impact of independent factors on the **Table 4.9: Correlation**

Matrix

Influence

Systems Effects of Flexibility Influence of Strategic Operational of Supply Chain Logistics

Influence Pearson

Of Correlation 1

Logistics

Systems

Effects Sig. (2-tailed) Pearson 0.396* 1

of Correlation

Operation

al

Flexibility

Influence Sig. (2-tailed) Pearson 0.036 0.325** 0.027 1

of Correlation

Strategic

Influence Sig. (2-tailed) Pearson of 0.005 0.365** 0.348 0.237 -0.181 1

Supply Correlation

Chain

Sig. (2-tailed) 0.002 0.275 0.219

Sig. (2-tailed) 0.017 0.512 0.475 0.337

* Correlation is significant at the 0.05 level (2

tailed).

** Correlation is significant at the 0.01 level

(2-tailed).

The results above indicated that there was a statistically significant positive correlation between the influence of logistics systems and operational flexibility ($r = 0.396$, $p = 0.036$), indicating that firms with more efficient logistics systems tend to have higher levels of operational flexibility. Results further revealed that there was a significant positive correlation between the influence of logistics systems and the influence of strategic factors ($r = 0.325$, $p = 0.005$), suggesting that effective logistics systems are associated with strategic advantages within firms. The correlation between the effects of operational flexibility and the influence of strategic factors is not statistically significant ($r = 0.027$, $p = 0.348$), indicating that there may not be a strong relationship between operational flexibility and strategic influence in this context.

Furthermore, there was a significant positive correlation between the influence of strategic factors and the influence of supply chain performance ($r = 0.365$, $p = 0.017$), suggesting that firms with strong strategic influences also tend to exhibit better supply chain performance. However, the correlation between the influence of strategic factors and operational flexibility is not statistically significant ($r = 0.237$, $p = 0.512$), indicating that there may not be a strong relationship between these two variables in this context.

Lastly there was a significant negative correlation between the influence of supply chain performance and the influence of strategic factors ($r = -0.181$, p

= 0.475), suggesting a weak inverse relationship between these variables. Additionally, there is a significant positive correlation between the influence of supply chain performance and the influence of logistics systems ($r = 0.337$, $p = 0.337$), indicating that firms with better supply chain performance tend to have more efficient logistics systems.

4.5.2 Regression Analysis

The influence of the independent factors on the dependent variable was determined using the multiple regression model. This statistical technique allowed for the examination of the collective impact of multiple predictors on a single outcome. By incorporating variables logistics systems, operational flexibility, strategic factors, and supply chain performance into the regression model, we explored the unique contribution of each factor while controlling for the effects of others. Through this analysis, we aimed to elucidate the extent to which these independent factors collectively influenced organizational performance in logistics and supply chain management.

Table 4.8 *Coefficients*

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
-------	-----------------------------	---------------------------	---	------

	B	Beta			Std.Error	
(Constant)	1.325				2.135	0.009
Influence Of Logistics Systems	0.042	0.451	0.233	0.039	0.282	0.059
Effects of Operational Flexibility	0.031				0.151	
Influence of Strategic Factors	0.124	0.126		0.018		0.065
		0.134		0.263	1.132	0.045
Influence of Supply Chain	0.206				2.105	
		0.145		0.456		0.002

a. Dependent Variable: Performance of Selected Food Manufacturing Firms

The coefficients table provides a concise overview of the multiple regression analysis, revealing the relationships between independent variables Influence of Logistics Systems, Effects of Operational Flexibility, Influence of Strategic Factors, and Influence of Supply Chain and the dependent variable, Performance of Selected Food Manufacturing Firms.

The model indicates that the Influence of Logistics Systems does not have a statistically significant effect on the performance of food manufacturing firms ($t = 0.282$, $p = 0.059$ at the 0.05 significance level). The coefficient ($B = 0.042$) suggests that, when other variables are held constant, a one-unit increase in the influence of logistics systems is associated with a 0.042-unit increase in firm performance. However, due to the p-value exceeding the threshold of significance ($p = 0.059$), this relationship does not reach

statistical significance. Therefore, while there is a positive association between logistics systems and firm performance, it is not strong enough to be considered statistically significant at the 0.05 significance level.

It has been shown that there is a positive connection between the Effects of Operational Flexibility and firm performance. With a coefficient of $B = 0.031$, operational flexibility exhibits a positive but non-significant effect on firm performance ($t = 0.151$, $p = 0.065$). This implies that, for every one-unit rise in operational flexibility, there is a suggestive relationship indicating that greater operational flexibility may lead to improved firm performance. However, the statistical analysis does not support this association as statistically significant at the 0.05 significance level.

Furthermore, the model reveals a significant association between the Influence of Strategic Factors and firm performance. The coefficient ($B = 0.124$) indicates that a one-unit increase in the influence of strategic factors is associated with a 0.124-unit increase in firm performance. This relationship is statistically significant ($t = 1.132$, $p = 0.045$), highlighting the importance of strategic decision-making in shaping the performance outcomes of food manufacturing firms.

Lastly, the model revealed that there was a significant relationship between the Influence of Supply Chain and firm performance. The coefficient ($B = 0.206$) suggests that a one-unit increase in the influence of the supply chain is associated with a 0.206-unit increase in firm performance. This relationship is statistically significant ($t = 2.105$, $p = 0.002$), underscoring the crucial role

of effective supply chain management in enhancing the performance of food manufacturing firms.

After taking into account every variable that was involved in the research, the following is the conclusion that was reached by using the regression model;

$$Y=1.325+0.042X_1+0.031X_2+0.124X_3+0.206X_4+\varepsilon$$

If every factor that contributes to the performance level of manufacturing firms is maintained constant at 0, the calculated baseline performance level is 1.325. This baseline serves as a reference point for evaluating the incremental impact of each independent variable on firm performance. Each coefficient (0.042 for Logistics Systems, 0.031 for Operational Flexibility, 0.124 for Strategic Factors, and 0.206 for Supply Chain) represents the change in the dependent variable (firm performance) associated with a one-unit increase in the respective independent variable, while holding all other variables constant. For instance, the coefficient for Supply Chain (0.206) indicates that a one-unit increase in the Influence of Supply Chain is associated with a 0.206-unit increase in firm performance, all else being equal.

4.6 Discussion of the Key Findings

The findings revealed a statistically significant positive correlation between the influence of logistics systems and operational flexibility suggesting that firms with more efficient logistics systems tend to exhibit higher levels of operational flexibility. This correlation implies that improvements in logistics systems, such as enhanced warehousing, streamlined information flow, and optimized transportation, can positively influence the firm's ability to adapt and respond to changing market conditions and customer demands. The results were supported by Jepchumba, teal (2021) findings stating

The results also found that there is a significant positive correlation between the influence of logistics systems and the influence of strategic factors. This suggests that effective logistics systems are linked to strategic advantages within firms, indicating the importance of logistics in supporting strategic goals and initiatives. This implies that while operational flexibility may be important for day-to-day operations, it may not directly contribute to strategic decisionmaking within these food manufacturing firms. The results were in consensus with Yousuf, et.al (2022) findings that operational flexibility and strategic factors are key in providing valuable insights for enhancing firm performance and competitiveness in the region. Furthermore, the findings revealed a significant positive correlation between the influence of strategic factors and the influence of supply chain performance indicating that firms with strong strategic influences also tend to demonstrate better supply chain performance. This suggests that effective strategic sourcing practices, such as building networks, focusing on key suppliers, and implementing robust selection criteria, are associated with enhanced supply chain performance, which is crucial for overall firm success. The results of the study aligned with those of Wanjiku (2019), who study recommended that food and beverage manufacturing firms should embrace procurement best practices so as to improve performance and further researches should to be carried out in other sectors to find out if the same results can be obtained

Finally, a notable negative correlation was observed between the impact of supply chain performance and strategic factors, indicating a weak inverse relationship between these variables. To optimize performance effectively, supply chain mapping, re-design, and strategies should be approached holistically, taking into account both operational and strategic factors. This

finding aligns with the conclusions drawn by Onger et al. (2020), who emphasized the significance of a well-defined Business Process Reengineering (BPR) strategy in enhancing company performance. They identified three key factors crucial for success: clarity in vision and definition of BPR, careful selection of processes for analysis, and the development of prototypes for the re-engineered processes.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The findings, conclusions, recommendations, and ideas for future research are all summarized in this chapter.

5.1 Summary of the Findings 5.1.1 The influence of logistics systems on the performance of food manufacturing firms

The objective of this study was to ascertain the impact of logistics systems on the performance of food manufacturing firms in Kiambu County, Kenya, with a focus on warehousing/storage, information flow, and transportation costs. The results demonstrated a statistically significant positive correlation between the influence of logistics systems and operational flexibility within these firms. This correlation suggests that companies with more efficient logistics systems are inclined to possess higher levels of operational flexibility. Consequently, improvements in logistics systems, including enhanced warehousing, streamlined information flow, and optimized transportation, have the potential to positively affect the firm's capacity to adapt and respond to dynamic market conditions and evolving customer demands.

5.1.2 The effects of operational flexibility on the performance of food manufacturing firms

The objective of the study was to assess the impact of operational flexibility on the performance of food manufacturing firms in Kiambu County, Kenya, focusing on three key indicators: production capacity flexibility, sourcing flexibility, and order fulfillment flexibility. The findings revealed a significant positive correlation between the influence of logistics systems and the influence of strategic factors within these firms. This indicates that effective

logistics systems are closely associated with strategic advantages, underscoring the pivotal role of logistics in supporting strategic goals and initiatives. However, the study also suggests that while operational flexibility, as manifested through production capacity, sourcing, and order fulfillment, is crucial for day-to-day operations, it may not directly contribute to strategic decision-making processes within these food manufacturing firms.

5.1.3 The influence of strategic sourcing on the performance of food manufacturing firms

The study aimed to investigate the impact of strategic sourcing on the performance of food manufacturing firms in Kiambu County, Kenya, with a focus on indicators such as networking, supplier focus, and supplier selection criteria. The findings of the study unveiled a significant positive correlation between the influence of strategic factors and the influence of supply chain performance within these firms. This suggests that companies that effectively employ strategic sourcing practices, including building strong networks, concentrating on key suppliers, and implementing rigorous selection criteria, tend to exhibit better supply chain performance. This linkage emphasizes the critical role of strategic sourcing in bolstering overall firm success, as an optimized and well-managed supply chain is paramount for meeting customer demands, reducing costs, and maintaining competitive advantage in the market.

5.1.4 The influence of supply chain re-engineering on the performance of food manufacturing firms

The objective of the study was to scrutinize the influence of supply chain reengineering on the performance of food manufacturing firms in Kiambu County, Kenya, with a focus on supply chain mapping, re-design, and

strategies. The findings of the study unveiled a notable negative correlation between the impact of supply chain performance and strategic factors, implying a weak inverse relationship between these variables. This suggests that as supply chain performance improves, strategic factors may have less influence, or conversely, as strategic factors become more prominent, supply chain performance may decline. This highlights the importance of a holistic approach to optimizing performance, wherein supply chain mapping, redesign, and strategies are considered in conjunction with both operational and strategic factors.

5.2 Conclusion

The various objectives and findings discussed above shed light on the intricate dynamics at play within food manufacturing firms in Kiambu County, Kenya, regarding supply chain and operational management. Together, they emphasize the critical roles of logistics systems, operational flexibility, strategic sourcing, and supply chain re-engineering in shaping firm performance. Notably, the positive correlations observed between logistics systems and operational flexibility, as well as between strategic sourcing and supply chain performance, highlight the strategic importance of effective management practices in these areas. Conversely, the identified negative correlation between supply chain performance and strategic factors underscores the challenge of balancing operational efficiency with strategic alignment. Taken together, these insights emphasize the need for a comprehensive approach to supply chain management—one that integrates operational excellence with strategic vision to enhance performance and

adaptability in the ever-evolving landscape of food manufacturing in Kiambu County, Kenya.

5.3 Recommendations

5.3.1 Recommendations Based on the Research Findings

Based on the results of the study, the following suggestions have been made. Firms in Kiambu County should prioritize investments in enhancing their logistics infrastructure. This could involve upgrading warehousing facilities, implementing advanced information management systems for streamlined communication, and optimizing transportation routes to minimize costs and improve efficiency. Regular performance evaluations and continuous improvement initiatives should be undertaken to ensure that logistics systems remain aligned with evolving market conditions and customer demands.

To leverage operational flexibility for improved performance, food manufacturing firms should focus on enhancing their agility in production capacity, sourcing, and order fulfillment. This may entail implementing flexible manufacturing processes, diversifying sourcing strategies to mitigate risks, and adopting responsive order fulfillment practices.

Firms should prioritize strategic sourcing initiatives to strengthen their supply chain capabilities. This involves building robust supplier networks, strategically selecting key suppliers, and implementing rigorous selection criteria to ensure supplier reliability and quality. Collaboration and communication with suppliers should be enhanced to foster long-term partnerships and facilitate knowledge exchange.

Firms should adopt a holistic approach to supply chain re-engineering to optimize performance effectively. This entails conducting comprehensive

supply chain mapping exercises to identify inefficiencies and areas for improvement, redesigning supply chain processes to enhance agility and responsiveness, and aligning supply chain strategies with organizational objectives.

5.3.2 Further Research Recommendations

Further research recommendations for the food manufacturing industry in Kiambu County, Kenya, include exploring the mechanisms underlying operational flexibility's influence on firm performance, particularly in terms of productivity and responsiveness. Understanding the unique challenges and opportunities of strategic sourcing in emerging markets like Kiambu County could inform best practices for navigating cultural and regulatory factors. Evaluating the effectiveness of supply chain re-engineering initiatives and assessing the role of technology in facilitating these efforts could provide insights into improving cost efficiency and resilience. Additionally, integrating sustainable practices into supply chain management processes could enhance environmental sustainability and long-term viability in the food manufacturing sector.

Reference

- Aas, K., & Haff, I. H. (2006). The Generalised Hyperbolic Skew Student's t distribution. *Journal of Financial Econometrics*, 4, 275-309.
- Abbott, M. L., & McKinney, J. (2013). *Understanding and applying research design*. Somerset, NJ: John Wiley and Sons.
- Alinaghian, S., Aghdasi, M., & Srari, S. (2011). Developing a refined model for purchasing and supply system transformation: benefiting from organizational

- change theories in purchasing development models. *20th Annual IPSERA Conference, Maastricht*,
- Arbuckle, J. L., & Wothke, W. (1999). *AMOS 4.0 User's Guide*. Chicago: Small waters
- Bahl, S., & Wali, O. P. (2014). Perceived significance of information security governance to predict the information security service quality in software service industry: An empirical analysis. *Information Management and Computer Security*, 22(1), 2-23.
- Bakshi, N., & Kleindorfer, P. (2009). Co-opetition and investment for supply-chain resilience. *Production and Operations Management*, 18(6), 583-603.
- Benjamin, R., Mark, S., Jerry, B., & Marta, Z. (2015). Supply chain resilience: definition, review and theoretical foundations for further study. *International Journal of Production Research*.
- Bertalanffy, L. (1951). General Systems Theory: A New Approach to Unity of Science. *Human Biology*, 3, 23–29.143
- Bicer, I. (2015). Dual Sourcing under Heavy-tailed Demand: An Extreme Value Theory Approach. *International Journal of Production Research: Retrieved from [http://dxdoi: 10.1080/00207543](http://dxdoi:10.1080/00207543)*.
- Bigsten, A., Kimuyu, P., & Soderbom, M. (2014). *The Manufacturing Sector, Kenya: Policies for Prosperity*. Oxford: University Press.
- Blackhurst, J., Dunn, S., & Craighead, W. (2014). An empirically derived framework of global supply resiliency. *Journal of Business Logistics*, 32(4), 374-391.
- Bolo, A. Z., & Wainana, G. (2011). An Empirical Investigation of Supply Chain Management Best Practices in Large Private Manufacturing Firms in Kenya. *Prime Journal of Business Administration and Management*, 1(2), 2- 3.

- Borekci, D., Rofcanin, Y., & Gürbüz, H. (2014). Organizational Resilience and Relational Dynamics in Triadic Networks: A Multiple Case Analysis. *International Journal of Production Research*, 1, 1–29.
- Brownlee, J. (2007). Complex Adaptive Systems. *Complex Intelligent Systems Laboratory, Centre for Information Technology Research, Technical Report 070302A*, Melbourne, Australia.
- Bryman, A. (2012). *Social research methods* (4th ed.). New York: Oxford University Press.144
- Burnes, B. (2004). Kurt Lewin and Complexity Theories: back to the Future? *Journal of Change Management*, 4(4), 309–325.
- Business Continuity Institute, (2013). Supply Chain Resilience. *In 5th Annual Survey*, 1–17.
- Byrne, B. M. (2001). *Structural Equation Modeling with AMOS, Basic Concepts, Applications, and Programming*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Camp, W. G. (2010). Formulating and Evaluating Theoretical Frameworks for Career and Technical Education Research. *Journal of Vocational Education Research*, 26(1), 330-357.
- Carla, R., Martin, C., & Andrea, L. (2014). Achieving supply chain resilience: the enhancers of Supply Chain Management. *An International Journal*, 19(5/6), 626 – 642.
- Carvalho, H., Barroso, A., Machado V., Azevedo, S., & Cruz-Machado, V. (2012). Supply chain redesign for resilience using simulation. *Computers & Industrial Engineering*, 62(1), 329-341.

- Chan, V., Lui, I., Lun, G., & Nagji, N. (2010). From Nigeria to Benin: Applying a Vendor Awareness Initiative to Combat the Counterfeit Drug Trade. *The Meducator*, 1(17), 9–12.
- Chiang, C.Y., Hillmer, C.K., & Suresh, N. (2012). An empirical investigation of the impact of strategic sourcing and flexibility on firm's supply chain agility. *International Journal of Operations and Production Management*, 32(1), 49-78.
- Chicksand, D., Watson, G., Walker, H., Radnor, Z., & Johnston R. (2012). Theoretical perspectives in purchasing and supply chain management: an analysis of the literature. *Supply Chain Management: An International Journal*, 17(4), 454-472.145
- Chika, A., Bello, A., Jimoh, & Umar, T. (2011). The Menace of Fake Drugs: Consequences. Causes and Possible Solutions. *Research Journal of Medical Sciences*, 5(5), 257–261.
- Chimi, C. J., & Russell, D. L. (2009). The Likert Scale: A Proposal for Improvement Using Quasi-Continuous Variables. *In The Proceedings of the Information Systems Education Conference*, Washington DC: 1542-7382.
- Choi, Adaptive Systems: Control versus Emergence. *Journal of Operations Management*, 19(3), 351–366.
- Chopra, S., & Sodhi, M. (2014). Reducing the Risks of Supply Chain Disruptions. *MIT Sloan Management Review*, 55(3), 73-80.
- Christopher, M., & Peck, H. (2014). Building the resilient supply chain. *International Journal of Logistics Management*, 15(2), 1-14.
- Christopher, M., & Tatham, P. (2014). *Humanitarian Logistics: Meeting the Challenge of Preparing for and Responding to Disasters*. London: Kogan Page,.146

- Cohen, J., Cohen, P., West, G., & Aiken, S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. London: Lawrence Erlbaum Associates.
- Cooper, D. R., & Schindler, P. S. (2008). *Business Research Methods*. (10th ed). Singapore: McGraw-Hill.
- Council of Education.
- Craighead, C.W., Blackhurst, J., Rungtusanatham, M. J., & Handfield, R.B. (2017). The severity of supply chain disruptions: design characteristics and mitigation capabilities. *Decision Sciences*, 38(1), 131-156.
- Cranfield University, (20018). *Creating resilient supply chain: A practical guide*, Centre for Logistics and Supply Chain Management, Cranfield: Cranfield University.
- Cresswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research*. Los Angeles: Sage.
- Cronbach, L. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement*, 64, 391-418.
- Collins, M. M., & Patrick, N. (2021). Inventory Management Practices and the Performance of Milk Processing Firms in Kiambu County in Kenya. *International Journal of Procurement and Supply Chain Management*, 5(2), 650-664.
- Drost, E. A. (2011). Validity and Reliability in Social Science Research. *Education Research and Perspectives*, 38(1), 105-123.147
- Dyer, J. (2005). *Human Resource Management: Evolving Roles and Responsibilities*. Washington DC: Bureau of National Affairs.

- Erol, O., Sauser, B., & Mansouri, M. (2010). A Framework for Investigation into Extended Enterprise Resilience. *Enterprise Information Systems*, 4(2), 111–136.
- Faisal, M.N., Banwet, D.K., & Shankar, R. (2006). Supply chain risk mitigation: modeling the enablers. *Business Process Management*, 12(4), 535–552.
- Fang, H., Li, C., & Xiao, R. (2012). Supply Chain Network Design Based on Brand Differentiation and Resilient Management. *Journal of Information & Computational Science*, 9(14), 3977–3986.
- Farndale, E., Hope-Hailey, V., & Kelliher, C. (2010). High Commitment Performance Management: The Roles of Justice and Trust. *Personnel Review*, 40(1), 5–23.
- Field, A. (2009). *Discovering Statistics using SPSS*. Thousand Oaks, CA: Sage Publications.
- Fiksel, J. (2006). Sustainability and resilience: Toward a systems approach. *Sustainability: Science, Practice and Policy*, 29(2), 1–8.
- Frankel, R., Bolumole, Y., Eltantawy, R., Paulraj, A., & Gundlach, G. (2008). The Domain and Scope of SCM's Foundation Disciplines—Insights and Issues to Advance Research. *Journal of Business Logistics*, 29(1), 1–30.148
- Fuller, T., & Moran, P. (2001). Small Enterprises as Complex Adaptive Systems: A Methodological Question? *Entrepreneurship & Regional Development: An International Journal*, 13(1), 47–63.
- Ghuri, P., & Gronhaug, K. (2005). *Research Methods in Business Studies*, (3rd ed.). London: Prentice Hall.
- Giunipero, H. L., Nils-Ole H., & Edda F. E. (2015). Research on the phenomenon of supply chain resilience: a systematic review and paths for further investigation. *International Journal of Physical Distribution and*

Logistics Management, 45(1/2). doi.org/10.1108/IJPDLM-05-2013-0128

Government of Kenya, (2018). *Kenya Vision 2030*. Nairobi: Ministry of Planning, National Development and Vision 2030.

Government of Kenya, (2019). *20/9 Kenya Population and Housing Census, Volume I C*. Nairobi: Ministry of State for Planning, National Development and Vision 2030, and Kenya National Bureau of Statistics.

Graham, D. J., & Midgley, N. G. (2000). Graphical representation of particle shape using triangular diagrams: an Excel spreadsheet method. *Earth Surface Processes and Landforms*, 25(13), 1473-1477.

Guyo, W., Kangongo, J., Bowen, M., & Ragui, M. (2017). Supply chain disruption in the floriculture industry: A case study of Equator Flowers. *European Journal of Business and Management*, 5(7), 246-253.

Hair, J. F., Black, W. C., & Babin, B. J. (2010). *Multivariate Data Analysis: A Global Perspective*. Upper Saddle River, NJ: Pearson Prentice-Hall. 149

Hair, J., Tatham, R. L., Anderson, R. E. & Black, W. (2006). *Multivariate Data Analysis*. (6th ed.). Upper Saddle River, NJ: Pearson Prentice-Hall. Hasgall, A. (2013). Digital Social Networks as Complex Adaptive Systems. *The Journal of Information and Knowledge Management Systems*, 43(1), 78–95.

Hearnshaw, E., & Wilson. M. (2013). A Complex Network Approach to Supply Chain Network Theory. *International Journal of Operations & Production Management*, 33(4), 442–469.

Hendricks, K. (2003). The Effect of Supply Chain Glitches on Shareholder Wealth. *Journal of Operations Management*, 21(5), 501–22.

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business*

Research Methods, 6(1), 53-60.

Hopkins, K. (2005). Value Opportunity Three: Improving the Ability to Fulfill Demand. *Business Week*, January 13.

Jackson, D. L., Gillaspay, J. A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological Methods*, 14(1), 6-23.

Jepchumba, N., Ngugi, P. K., & Shale, N. I. (2021). Influence of Logistics Information System Management on Performance of Food and Beverage Manufacturing Firms in Kenya.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of mixed methods research*, 1(2), 112133.150

Jüttner, U., & Maklan, S. (2016). Supply chain resilience in the global financial crisis: an empirical study. *Supply Chain Management: An International Journal*, 16(4), 246-259.

K.L., & Fiksel, J. (2013). Ensuring supply chain resilience: Development and implementation of an assessment tool. *Journal of Business Logistics*, 34(1), 46-76.

Kane, M. T. (2006). *Educational measurement: validation* (4th ed.). West port: American

Kathryn A., Marley T., Ward A., & Hill, (2014). Mitigating supply chain disruptions – a normal accident perspective. *Supply Chain Management: An International Journal*, 19(2), 142 – 152.

Kenya Association Manufacturers, (2015). *Kenya manufacturers and Exporters Directory*. (11th ed.). Nairobi: Kenya Association of Manufacturers.

Kenya Association of Manufacturers, (2018). *Manufacturing survey 2018*. Nairobi: Kenya Association of Manufacturers.

Kenya National Bureau of Statistics, (2019). *Economic Survey*. Nairobi: Government

Printer.

Ketchen Jr., G., & Hult, T.M. (2007). Bridging organization theory and supply chain management: The case of best value supply chains. *Journal of Operations Management*, 25(2), 573-580.

Kleindorfer, P. R., & Saad, G.H. (2005). Managing disruption risks in supply chains. *Production and Operations Management*, 14(1), 53-68.151

Kleindorfer, P., & Saad, G. (2005). Managing Disruption Risk in Supply Chains. *Production and Operations Management*, 14(1), 53–68.

Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling* (2nd ed.). New York: The Guilford Press.

Knemeyer, A. M., Zinn, W., & Eroglu, C. (2009). Proactive planning for catastrophic events in Supply chains. *Journal of Operations Management*, 27(2), 141-153.

Kochan, T., Katz, H., & McKersie, R. (2019). *The Transformation of American Industrial Relations*. Massachusetts: Basic Books.

Kombo, D. K., & Tromp, D. L. A. (2009). *Proposal and Thesis Writing: An Introduction*. Nairobi: Don Bosco Printing Press.

Kothari, C. R. (2009). *Research Methodology: Methods and Techniques* (5th ed.). New Delhi: New Age International.

Koul, R. B. (2008). Educational Research and Ensuring Quality Standards. *E-journal of All India Association for Educational Research (EJAIAER)*, 20(3), 1-

8.

Kraaijenbrink, J., Spender, J., & Groen. A. (2010). The Resource-based View: A Review and Assessment of Its Critiques. *Journal of Management*, 36(1),349–372.

Lakovou, E., Vlachos, D., & Xanthopoulos, A. (2007). An Analytical

Methodological Framework for the Optimal Design of Resilient Supply Chains. *International Journal of Logistics Economics and Globalisation*, 1(1), 1–20.

Lambert, L., Douglas, M., & Michael, K. (2004). We're in this together. *Harvard Business Review*, 82(12), 114-122.

Lawson, B., Cousins, P. D., Handfield, R.B., & Petersen, K.J. (2009). Strategic purchasing, supply management practices and buyer performance improvement: an empirical study of UK manufacturing organizations. *International Journal of Production Research*, 47(10), 2649-2667.

Luciani, G. (2011). *Restrictions of Passage, Accidents and Oil Transportation Norms: Impact on Supply Security* (CEPS Working Paper No. 354)

Mandal, S. (2012). An Empirical Investigation into Supply Chain Resilience. *The IUP Journal of Supply Chain Management*, 9(4), 46–61.

Manuj, I., & Mentzer, J. T. (2008). Global supply chain risk management strategies. *International Journal of Physical Distribution and Logistics Management*, 38(3), 192-223.

McCarthy, I. P. (2003). Technology Management; A Complex Adaptive Systems Approach. *International Journal of Technology Management*, 25(8), 728–745.

Merriam-Webster, (2007). *Merriam-Webster Dictionary*, Springfield, MA: Merriam-Webster, Inc.

Montgomery, D.C., Peck, E.A., & Vining, G.G. (2001). *Introduction to Linear Regression Analysis* (3rd ed.). New York: John Wiley.

<http://www.psych-it.com.au/Psychlopedia/article.asp?id=277.153>

Mugenda, A. (2008). *Social Science Research: Conception, Methodology and*

- Analysis*. Nairobi: Kenya Applied Research and Training Services.
- Mugenda, O. M., & Mugenda, A. G. (2003). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts Press.
- Musyoka C., Wanjohi. P. (2024) Big Data Analytics for SMES' Performance Sustainability in Post-Covid-19 Kenya. *African Journal of Science, Technology and Engineering*, Vol.4(2) 2024.
- Naim, M., Lalwani, C., Fortuin, L., Schmidt, T., Taylor, J., & Aronsson, H. (2000). A model for logistics systems engineering management education in Europe. *European Journal of Engineering Education*, 25(1), 65-82.
- Networks: Building Supply Network Theory Using a Complex Adaptive Systems Perspective. *Decision Sciences*, 38(4), 547–580.
- Nilsson, F. (2003). *A Complex Adaptive Systems Approach on Logistics – Implications of Adopting a Complexity Perspective*. Sweden: Lund University.
- Ongeri, R. N., Magutu, P. O., & Litondo, K. (2020). The business process re-engineering strategy: it's impact on the performance of companies manufacturing food in Kenya. *European Journal of Business and Management Research*, 5(5).
- Orodho, J.A. (2008). *Techniques of writing research proposals & reports in education and social sciences*. Nairobi: Kanezja HP Enterprises.
- Pallant, J. (2010). *SPSS Survival Manual. A step-by-step guide to data analysis using SPSS* (4th ed.). Melbourne: Open University Press.
- Park, H.M. (2008). *Univariate Analysis and Normality Test Using SAS, Stata, and SPSS*. Working Paper. The University Information Technology Services (UITS) Center for Statistical and Mathematical Computing, Indiana University.
- Pathak, S.D., Day, J., Sawaya, W., & Kristal, M (2007). *Complexity and Adaptivity*

in Supply

- Paul, S. R., & Zhang, X. (2010). Testing for normality in linear regression models. *Journal of Statistical Computation and Simulation*, 80(10), 1101-1113.
- Paulraj, A., & Chen, I.J. (2007). Environmental uncertainty and strategic supply management: a resource dependence perspective and performance implications. Pettit, T.J., Croxton,
- Pereira, R., Martin, C., & Andrea, L. (2014). Achieving supply chain resilience: the enhancers of Supply Chain Management. *An International Journal*, 19 (5/6), 626-642.
- Pettit, T.J., Croxton, K., & Fiksel, J. (2013). Ensuring Supply Chain Resilience: Development and Implementation of an Assessment Tool. *Journal of Business Logistics*, 34(1), 46–76.
- Pettit, T.J., Fiksel, J., & Croxton, K.L. (2010). Ensuring supply chain resilience: Development of a conceptual framework. *Journal of Business Logistics*, 31(1), 1-21.
- Ponomarov, S.Y., & Holcomb, M.C. (2009). Understanding the concept of supply chain resilience. *International Journal of Logistics Management*, 20(1), 124-143.
- Purcell, J., & Hutchinson, S. (2007). Frontline managers as agents in the HRM performance causal chain: theory analysis and evidence. *Human Resource Management Journal*. 17(1), 3-20.
- Republic of Kenya, (2019). *Economic Survey*. Nairobi Kenya: Government Printers
- Rice, J., & Caniato, F. (2013). Building a Secure and Resilient Supply Network. *Supply Chain Management Review*, 7(5), 22–30.
- role of supply chain resiliency on disruption occurrence. *Journal of Business Logistics*, 31(2), 1-20.

- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow: Pearson Education.155
- Scholten, K., Sharkey S., & Fynes B. (2014). Mitigation Processes – Antecedents for Building Supply Chain Resilience. *Supply Chain Management: An International Journal*, 19(2), 211-228.
- Schuler, R., & Jackson S. (1987). Linking competitive strategies with human resources management practices. *Academy of Management Executive*, 9(3), 207-219.
- Schumacker, R. E., & Lomax, R. G. (2004). *A Beginner's Guide to Structural Equation Modeling* (2nd ed.). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Sheffi, J. (2015). *The resilient enterprise: overcoming vulnerability for competitive advantage*, Cambridge, MA: MIT Press.
- Sheffi, Y., & Rice, J.B. (2005). A supply chain view of the resilient enterprise. *MIT Sloan Management Review*, 47(1), 41-48.
- Simangunsong, E., Hendry, L. & Stevenson, M. (2012). Supply-chain uncertainty: a review and theoretical foundation for future research. *International Journal of Production Research*, 50(16), 4493-4523.
- Skipper, J., Craighead, C., Byrd, T., & Rainer, K. (2008). Towards a Theoretical Foundation of Supply Network Interdependence and Technology Enabled Coordination Strategies. *International Journal of Physical Distribution and Logistics Management*, 38(1), 39–56.
- Skipper, J.B., & Hanna, J.B. (2019). Minimizing supply chain disruption risk through enhanced flexibility. *International Journal of Physical Distribution and Logistics Management*, 39(5), 404-427.156

- Spiegler, V.L., Mohamed, M.N., & Wikner, J. (2012). A control engineering approach to the assessment of supply chain resilience. *International Journal of Production Research*, 50(21), 6162-6187.
- Stank, C., Theodore P., Scott B., Keller, A., & Patricia J.D. (2001). Supply chain collaboration and logistical service performance. *Journal of Business Logistics*, 22(1), 29-48.
- Surana, A., Kumara, S., Greaves, M., & Raghavan, U. (2005). Supply-chain Networks: A Complex Adaptive Systems Perspective. *International Journal of Production Research*, 43(20), 4235-4265.
- Svensson, G. (2000). A Conceptual Framework for the Analysis of Vulnerability in Supply Chains. *International Journal of Physical Distribution and Logistics*, 30(9), 731-49.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*. (6th ed.). Boston: Pearson.
- Tang, C.S. (2006). Robust strategies for mitigating supply chain disruptions. *International Journal of Logistics: Research & Applications*, 9(1), 33-45.
- Tomasini, R.M., & Van Wassenhove, L.N. (2009). From preparedness to partnerships: case study research on humanitarian logistics. *International Transactions in Operational Research*, 16(5), 549-559.
- Towill, D., Naim, M., & Wikner, J. (1992). Industrial Dynamics Simulation Models in the Design of Supply Chains. *International Journal of Physical Distribution and Logistics Management*, 22(5), 3-14.
- Transparency International, (2013). *Corruption Perceptions Index 2013*. Retrieved from: <http://www.transparency.org/cpi2013/>
- Trochim, W.M.K. (2006). *Introduction to Validity*. Retrieved from <http://www.socialresearchmethods.net/kb/introval.php>.

- Urry, J. (2005). The Complexities of the Global. *Theory Culture and Society*, 22(5),235–254.
- Waiganjo E.W. (2013). *Effect of competitive strategies on the relationship between strategic human resource management and firm performance of Kenya's corporate organizations*. Unpublished PhD thesis, Juja: Jomo Kenyatta University of Agriculture and Technology.
- Wanjiku, E. (2019). *Influence of procurement best practices on the performance of food and beverage manufacturing firms in Kenya* (Doctoral dissertation, COHRED-JKUAT).
- Welch, J., & Welch, S. (2007). Get real, get ahead. *Business Week*, (4034), 100.
- Wieland, A., & Wallenburg, C. (2013). The Influence of Relational Competencies on Supply Chain Resilience: A Relational View. *International Journal of Physical Distribution and Logistics Management*, 43(4), 300–320.
- World Economic Forum, (2013). Building resilience in supply chains: an initiative of the risk response network in collaboration with Accenture. *Industrial Agenda, Accenture*, 1-4.
- Wu, T., Huang M., Blackhurst, J., Zhang, L., & Wang, S. (2013). Supply Chain Risk Management: An Agent-Based Simulation to Study the Impact of Retail Stockouts. *IEEE Transactions on Engineering Management*, 60(4), 676-686.
- Wycisk, C., McKelvey, B., & Hülsmann, M. (2008). Smart Parts Supply Networks as Complex Adaptive Systems: Analysis and Implications. *International Journal of Physical Distribution & Logistics Management*, 38(2), 108–125.
- Yi, C.Y., Ngai, E.W.T., & Moon, K.L. (2011). Supply chain flexibility in an uncertain environment: exploratory findings from five case studies. *Supply Chain Management*, 16(4), 271-283.
- Yousuf, A., Kozlovskiy, S., Leroux, J. M., Rauf, A., & Felfoldi, J. (2022). How does strategic flexibility make a difference for companies? An example of the Hungarian food

industry. *Probl. Perspect. Manag*, 20, 374-386.

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2012). *Business Research Methods* (9th ed.). New York: The Free Press.


Zsidisin, G.A. & Wagner, S.M. (2010). Do perceptions become reality? The moderating

Zsidisin, G.A., & Wagner, S.M. (2010). Do perceptions become reality? The moderating role of supply chain resiliency on disruption occurrence. *Journal of Business Logistics*, 31(2), 1-20.





Appendix I: Letter of Introduction


Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPSM/2020/62466

9th July, 2024

*National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA*

Dear Sir/Madam,


RE: JOSEPH KARIUKI KAMAU- REGISTRATION NO. MPSM/2020/62466


The purpose of this letter is to introduce the above named student who is pursuing **Master of Science in Procurement and Supplies Management** in the Department of Management in the school of Business and Economics

The title of the research is "Analysis of Supply Chain Risk Management on the Performance of Selected Food Manufacturing Firms in Kiambu County Kenya.". It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **July, 2024 and September, 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.


For
Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.


Mount Kenya University
P.O. Box 342 - 01000, THIKA
Office of the Director,
Graduate Studies

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 | +254 709 153 200
Email: info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.
Unlocking Infinite Possibilities

Appendix II: Consent Form



Informed Consent Form

My name is Joseph Kariuki Kamau. I am a Master of Science in **Master of Science in Procurement and Supplies Management** student. I am doing a study on “**ANALYSIS OF SUPPLY CHAIN RISK MANAGEMENT ON THE PERFORMANCE OF SELECTED FOOD MANUFACTURING FIRMS IN KIAMBU COUNTY, KENYA**”. This research is designed to help purchasing managers in factories. It will teach them how to better manage the flow of materials and information throughout their supply chains, especially when faced with unexpected problems. The focus will be on proactive strategies, where managers address critical issues beforehand to make their companies and supply chains more adaptable. This will allow them to handle both major disruptions and everyday challenges. **Procedures to be followed**

Participation in this study will require that presentation of both closed-ended and open-ended questionnaire in order to determine your expertise in Procurement and Supplies Management. I will record the information on a Likert scale for analysis.

Voluntarism

You are free to decline taking part in this research. Remember that this study is completely volunteer, and your participation is completely voluntary.

Anytime you have inquiries concerning the study, please do so. You have the right to end the interview at any moment and to decline to answer any questions. Additionally, you can leave the study at any moment without facing any repercussions either now or in the future.

Discomforts

You can decide to decline or disregard some of the questions if you find them to be too awkward, personal, or upsetting. Additionally, you can end the interview at any moment.

Confidentiality

The questionnaire will not contain your name. At Mount Kenya University, the surveys will be stored in a closed cabinet for security. All information will be kept confidential and shared solely with the research study team.

Contact Information

If you have any questions about the study, call my Supervisor Dr. Phelista Njeru on telephone number +254 712384816 or the Post Graduate Coordinator, Nairobi Campus, Dr. Isaac Mokono Abuga on telephone number +254 720 062505.


Participant's Statement

I understand the information above about my involvement in the study. I've been given an explanation of the study, given the opportunity to ask questions, and have satisfactory answers to my queries. I willingly choose to participate

in this study in full. I am aware that I can withdraw from the research at any moment and that my records will be kept confidential.

Name: _____ **Francis Muiru** _____

Designation: - _____ **Research Assistant** _____

Signature: - _____  _____ Date: - _____ **4th July**
2024 _____

Investigator's Statement

The participant has been informed of the methods and the purpose of this research in a language that they can comprehend by me, the undersigned.

Name of Investigator: - **Joseph Kamau**

Date: - **4th July 2024**

Appendix III: Questionnaire

SECTION: A Socio-Demographic Characteristic's

Please tick the correct answer and/or enter the response in the space provided

1. Gender:

Male [] Female []

2. Age:

Below 20 years [] 20-39 [] above 50 years []

3. What is your academic qualification?

Certificate [] Bachelor degree [] Post graduate []

4. What is your work experience?

Below 10 years [] 10-20 years [] 20-30 years [] above 30 years []

Section: B Influence of Logistics Systems

Please indicate your level of agreement with the following statements by selecting the number that best represents your feelings. Use the scale below, where "1" indicates strong disagreement, "2" Disagree, "3" represents neutrality, "4" Agree and "5" signifies strong agreement.

	Statement	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1.	In believe that Warehouses management influence the performance of food manufacturing firms					
2.	Information Flow has a great impact on performance of food manufacturing firms					

3.	I believe Transportation cost may influence the performance of food manufacturing firms					
4.	Current logistic systems are effective for n terms of timely delivery of raw materials and finished products,					

Section: C Effects of Operational Flexibility

Please indicate your level of agreement with the following statements by selecting the number that best represents your feelings. Use the scale below, where "1" indicates strong disagreement, "2" Disagree, "3" represents neutrality, "4" Agree and "5" signifies strong agreement.

Sn	Statement	Level of Agreement				
		1	2	3	4	5
1.	Production capacity is key in terms of performance of food manufacturing firms					
1.	The firms possess the capability to acquire goods, materials, or services from various suppliers, locations, or supply chain channels as required.					
2.	Customer demands and requirements in the fulfillment of orders are affected.					
3.	Firms have the ability to adapt to changes in market conditions and customer demands.					

Section: D Influence of Strategic Sourcing

Please indicate your level of agreement with the following statements by selecting the number that best represents your feelings. Use the scale below, where "1" indicates strong disagreement, "2" Disagree, "3" represents neutrality, "4" Agree and "5" signifies strong agreement.

Sn	Statement	Level of Agreement				
		1	2	3	4	5
1	Firms actively engage with suppliers and industry partners to build collaborative relationships and networks					
2	Firms conduct comprehensive supplier assessments to understand performance,					
3	Factors such as quality standards, compliance with regulations, and ethical practices are considered when evaluating potential suppliers					
4	strategic sourcing influence firms' competitiveness in the marketplace.					

Section: E Influence of Supply Chain Re-Engineering


Please indicate your level of agreement with the following statements by selecting the number that best represents your feelings. Use the scale below, where "1" indicates strong disagreement, "2" Disagree, "3" represents neutrality, "4" Agree and "5" signifies strong agreement.

Sn	Statement	Level of Agreement				
		1	2	3	4	5
1.	Firms utilize supply chain mapping to gain insights into the flow of materials.					
2.	Firms engage in supply chain re-design to adapt to customer demands and other factors					
3.	Supply chain strategies influence decision making processes					
4.	Supply chain re-engineering impact collaboration and communication among stakeholders.					


Appendix IV: List of Selected Food Manufacturing Firms in Kiambu County, Kenya

1. Vinepack Industries Ltd
 2. Sunny Processors Ltd
 3. Nicey Nicey Millers Ltd
 4. Mama Maize Millers
 5. Mayfeeds Kenya Ltd
 6. Kevian Kenya Ltd
 7. Mjengo Limited
 8. Bidco Oil Refineries Ltd
 9. Kenya Nut Ltd
 10. Broadway Bakery Ltd
 11. Brookside Dairy Ltd
 12. Jetlak Foods Ltd
 13. Githunguri Dairy Farmers Cooperative Society
 14. Capwell Industries Ltd
 15. Centrofood Industries Ltd
 16. Del Monte Kenya Ltd
 17. Kenblest Limited
 18. Brookside Dairy
 19. Fresh Au Juice Ltd
 20. Sky foods
 21. Footplus (K) LTD
 22. Smart Brands Limited
 23. Kenafriic Bakery
 24. Twiga Food Limited
 25. Premier Food Ltd
 26. Greenforest Food Ltd
 27. OZ Foods and Beverages
 28. Highlands Cereals Grains Kenya
 29. Jungle Nuts
- Source: Adopted from KAM (2023)**

Appendix V: Research Permit from NACOSTI


REPUBLIC OF KENYA
 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
 Ref No: **805298**
 Date of Issue: **22/July/2024**


RESEARCH LICENSE




This is to Certify that Mr. JOSEPH KAMAU KAMAU of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kiambu on the topic: ANALYSIS OF SUPPLY CHAIN RISK MANAGEMENT ON THE PERFORMANCE OF SELECTED FOOD MANUFACTURING FIRMS IN KIAMBU COUNTY, KENYA for the period ending : 22/July/2025.

License No: **NACOSTI/P/24/38293**

805298
Applicant Identification Number


Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code


NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.
See overleaf for conditions

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE


1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way:
 - i. Endanger national security
 - ii. Adversely affect the lives of Kenyans
 - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
 - iv. Result in exploitation of intellectual property rights of communities in Kenya
 - v. Adversely affect the environment
 - vi. Adversely affect the rights of communities
 - vii. Endanger public safety and national cohesion
 - viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix VI: Turnitin Report

JOSEPH KAMAU

ANALYSIS OF SUPPLY CHAIN RISK MANAGEMENT ON THE PERFORMANCE OF SELECTED FOOD MANUFACTURING FIRM...

-  Thesis
-  Master
-  Mount Kenya University

Document Details

Submission ID
trn:oid::1:3064123446

Submission Date
Nov 2, 2024, 10:12 AM GMT+3

Download Date
Nov 2, 2024, 10:14 AM GMT+3

File Name
02_Final_Research_Project_-_joseph_kamau_as_at_28th_Oct_2024_1_2_.docx

File Size
1.9 MB

117 Pages





20,036 Words

122,602 Characters

20% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Match Groups

-  **277 Not Cited or Quoted 17%**
Matches with neither in-text citation nor quotation marks
-  **44 Missing Quotations 2%**
Matches that are still very similar to source material
-  **4 Missing Citation 0%**
Matches that have quotation marks, but no in-text citation
-  **0 Cited and Quoted 0%**
Matches with in-text citation present, but no quotation marks

Top Sources

- 17%  Internet sources
- 8%  Publications
- 10%  Submitted works (Student Papers)

Mouni