

**DETERMINANTS OF SUPPLY CHAIN RESILIENCE
AMONG FOOD PROCESSING FIRMS IN NAIROBI
COUNTY, KENYA**

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DECLARATION

I, the undersigned, declare that this research project is my original work and has not been submitted to any other college, institution or university for academic credit.

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DEDICATION

To my son Bob Danns; you can be whoever you want to be under the sky

TABLE OF CONTENTS

DECLARATION.....	i
ACKNOWLEDGEMENTS	ii
DEDICATION.....	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vii
ABBREVIATIONS AND ACRONYMS.....	viii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background to the Study.....	1
1.1.1 Supply Chain Resilience	2
1.1.2 Food Processing Firms in Nairobi County.....	3
1.2 Research Problem	3
1.3 General objective	4
1.3.1 Specific objectives.....	4
1.4 Value of the study	4
CHAPTER TWO: LITERATURE REVIEW	5
2.1 Introduction.....	5
2.2 Theoretical Framework.....	6
2.2.1 Dynamic Capabilities View	6
2.2.2 Relational View of the Firm.....	7
2.3 Determinants of Supply Chain Resilience	8
2.4 Empirical literature	9
2.5 Research Gap	12
2.6 Conceptual Framework.....	13
CHAPTER THREE: RESEARCH METHODOLOGY	14
3.1 Introduction.....	14
3.2 Research Design.....	14
3.3 Study Population.....	14
3.4 Data Collection	15

3.5 Data Analysis	16
CHAPTER FOUR.....	17
DATA ANALYSIS AND INTERPRETATION.....	17
4.1 Introduction.....	17
4.2 Response Rate.....	17
4.3 Demographic Information.....	17
4.3.1 Age	17
4.2.2 Education.....	18
4.2.3 Work experience	18
4.4 Descriptive Statistics.....	19
4.4.1 Supply Chain Resilience	19
4.4.1 Absorptive Capability and Supply Chain Resilience	20
4.4.2 Adaptive capability and supply chain resilience	21
4.4.3 Adaptive Capability and Supply Chain Resilience	22
4.5 Inferential Statistics	23
4.5.1 Correlation Analysis.....	23
4.5.2 Regression Analysis	24
CHAPTER FIVE	25
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	25
5.1 Introduction.....	25
5.2 Summary of Key Findings	25
5.3 Conclusion	25
5.4 Recommendations.....	26
5.5 Areas of Further Study.....	26
REFERENCES.....	27
APPENDICES	27
APPENDIX 1: RESEARCH QUESTIONNAIRE	32

LIST OF FIGURES

Figure 2.1: Conceptual Framework	15
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LIST OF TABLES

Table 3.1: Target Population and Sample Size.....	15
Table 3.2: Operationalization of variables.....	15
Table 4.1 Response Rate.....	17
Table 4.2: Respondents' Age.....	18
Table 4.3: Respondents' Education Level.....	18
Table 4.4 Respondents' experience.....	19
Table 4.5: Supply chain resilience descriptive statistics.....	19
Table 4.6: Absorptive capability descriptive statistics.....	20
Table 4.7: Innovation capability descriptive statistics.....	21
Table 4.8: Innovation capability descriptive statistics.....	22
Table 4.9: Correlation Analysis.....	23
Table 4.10: Regression coefficients.....	24

ABBREVIATIONS AND ACRONYMS

DC	Dynamic Capabilities
DCV	Dynamic Capability View
EAC	East African Community
EFA	Exploratory Factor Analysis
IS	Information Systems
MVA	Manufacturing Value Added
RBV	Resource Based View
SCA	Sustainable Competitive Advantage
SCM	Supply Chain Management
WoS	Web of Science

ABSTRACT

The COVID-19 pandemic caused huge disruptions in global and domestic business as countries and borders were closed to contain the spread of the virus. This means companies' supply chain resilience was tested. Hence, this study looked into determinants of supply chain resilience among food processing firms in Nairobi County, Kenya. Out of this topic, three independent variables were identified: absorptive capability, innovation capability, and adaptive capability on SCR. The theoretical framework was based on the dynamic capabilities view and relational view of the firm. A descriptive research design was adopted from which a target population of 102 food processing firms was identified. Out of this population, the sample size was determined as 192 managers from each of the firms using stratified random sampling. The regression analysis indicated that innovative capability, absorptive capability, and adaptive capability had a positive and significant effect on SCR in that order. The study recommends that food processing firms to provide continuous training to their staff on risk management so as to promote a culture in which risks are anticipated and strategies for responding to these risks can be proposed from the staff so as to enhance the organizations' supply chain resilience. Secondly, there is need for food processing firms to motivate staff to share knowledge within the organisation on risk management so as to promote knowledge sharing during supply chain disruptions and thereby enhance the capacity of the supply chain to be resilient during any future operational crisis that may arise.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The resilience of supply chains has emerged as a key operations management topic. Modern supply chains are more complex and larger in scale, due to global sourcing. With climate change, natural disasters tend to occur more frequently and severely. Under this environment, the chance for disruptions among supply chains is ever present especially in areas susceptible to natural disasters (Chaidilok, 2017). The impact of supply chains disruptions in operations management is manifested in sales decrease as a result of failure to meet end-customer demand due to late delivery, partially completed orders, and product unavailability (Katsaliaki, Galetsi, & Kumar, 2020).

According to Liu (2020), the COVID-19 pandemic caused diverse disturbances to supply chains and this resulted in practitioners and researchers reassessing the risks and benefits in international sourcing and finding means by which to enhance supply chain resilience (SCR). Majority of international firms operations crumbled during the COVID-19 pandemic and managers from these corporations are searching for means for their supply chains can be readjusted to reduce incidence of future disruptions and its effects (Agarwal & Seth, 2021). There is a need for businesses and supply chains to be resilient and improve on how they react and detect risks that may have disastrous financial outcomes (Kosgey, 2021).

SCR is the power of a supply chain to anticipate unplanned occasions, answer to these disturbances, and mend from at the crucial time thereby keeping things moving at the expected performance level (Kosgey, 2021). The reactions to supply chain disturbances and how firms can survive them have caused practitioners and academia to reexamine resiliency of supply chains on both local and international scale. The literature on SCR has increased drastically in the past decade and is now becoming a mainstream subject in academia. SCR has also become one of the most investigated subjects based on the consequences of COVID-19 pandemic from an operations management perspective.

The study adopts dynamic capability view (DCV) which proposes that firms with dynamic capabilities (DCs) can notice changes in the market and take advantage of these opportunities. DCs allow companies to capitalize on opportunities in the market by deploying and redeploying their internal resources (Teece, Pisano, & Shuen, 1997). The DCV contributes to how companies can be able to achieve their Sustainable Competitive Advantage (SCA) The relational view of the firm proposed by Dyer and Singh (1998) is the second theory used and describes competitive advantage by concentrating on company networks as units of analysis recommending that firms should invest in inter-firm sharing of knowledge and relation-specific assets and a huge probability for relational rents (Blackhurst, Dunn, & Craighead, 2011).

1.1.1 Supply Chain Resilience

Ochieng (2018) measured SCR by risk management culture, agility, supply chain reengineering, and collaboration. Similarly, Gitonga (2021) included risk management, supply chain re-engineering, lean and agile strategy, and strategic collaboration were as indicators for SCR. SCR was defined by Brandon-Jones, El-Beheiry, and Afia (2014) as the power of a structure to maintain its new form or shift to a new and more desired state after some disturbance and requires a mix of adaptability and flexibility. According to Neboh and Mbhele (2020), define SCR as a critical research area that is growing in the supply chain agenda that aims to reduce disruptions with little or no effect on retail business operations.

Weick and Sutcliffe (2007) describe SCR as capacity of the company to avoid unexpected shock or collapse (absorption capacity); the ability of a company to invent new futures (renewal capacity); and ability of a firm to be stronger from disruptive experiences (ownership capacity). Likewise, Wang and Ahmed (2007) grouped capability factors into three dimensions and described them as dynamic capabilities which consist of innovative, absorptive, and adaptive capabilities. Arani (2017) measured supply chain resilience by using market share growth, customer services, and firm profitability.

1.1.2 Food Processing Firms in Nairobi County

In many African countries, food processing is a significant part of manufacturing and makes a large contribution to the national economies. Food processing is the most critical subsector of the manufacturing sector in Kenya as it represents for more than half of the manufacturing value added (MVA) and has been recognized as a beginning point for the nation's industrialization process (Wamalwa, Kamau, & McCormick, 2020). However, the growth of the sector was slowed by food manufacturing more so in processing and preservation of fish, tea processing, biscuits and sugar manufacturing (KIPPRA, 2020).

In the manufacture of food products, activities include; coffee processing, beverage manufacturing, dairy product processing, bakery and grain mill product manufacturing, processed and preserved fish; sugar processing; and tea processing (Kenya national Bureau of Statistics [KNBS], 2021). The COVID-19 pandemic had an effect on the duration work on agriculture-related activities indicating that food processing and employees from other associated trades had the highest different between the actual hours worked and usual hours worked in a week (KIPPRA, 2021).

1.2 Research Problem

Most evident has identified different factors result in SCR of different firms in different sectors from a global, regional, and local perspective. Pettit, Fiksel, and Croxton (2019) distinguished determinants of SCR into vulnerability and capability factors. Vulnerability factors are those that may limit ability of systems to resist and survive for the incoming disruptions while capability factors have positive outcomes to SCR improvement implying that capability factors result to resilience resulting in less disruption cost. In the East African Community (EAC) region, trade distribution and food production were affected by food supply chains due to COVID-19 (KNBS, 2021). These contractions in the food manufacturing subsector were in coffee processing (-12.6%); beverage (-16.7%); dairy product (-5.7%); bakery product (-3.5%); grain mill product (-6.4%) and processed and preserved fish (-3.8%).

There are several studies that have been done on SCR among manufacturing firms in Kenya. These include Arani (2017) study on enhancers for building supply chain

resilience which found that re-engineering supply chains, strategic sourcing, risk awareness and operational flexibility were significant predictors of achieving SCR. Muricho and Muli (2021) research on influence of SCR practices on performance found that risk management in supply chains, agility, supply chain integration, and collaboration had an effect on performance. Kosgey (2021) assessed effect of SCR on organizational performance and established positive effects of environmental uncertainty and information management on performance. Gitonga (2021) study on SCR and operational performance found that risk management, supply chain re-engineering, lean and agile strategy, and strategic collaboration had effects on performance. However, there is paucity of studies examining capability factors influence on SCR of food processing firms which this study aims to contribute knowledge.

1.3 General objective

The main objective was to establish determinants of supply chain resilience among food processing firms in Kenya.

1.3.1 Specific objectives

The study was guided by the following specific objectives;

- i. To establish contribution of absorptive capability on SCR of food processing firms in Nairobi County
- ii. To investigate influence of innovation capability on SCR of food processing firms in Nairobi County
- iii. To evaluate influence of adaptive capability on SCR of food processing firms in Nairobi County

1.4 Value of the study

The policy and legislative framework of a sector has an important function in providing support for adopting strategies to assist firms deal with challenges. Hence, policy and decision makers benefit from results which will provide information and make recommendations which if adopted may lead to policy design that will provide support for food processing firms cope with SCR during local and/or global disruptions in the future. The top management might find the results useful by identifying determinants that

have a positive effect on SCR will be identified and this information if implemented will allow food processing to become resilient. The study may also be of importance to food processing consumers as the findings and recommendations if adopted will lead to a more resilient supply chain and consumers enhancing access food products in time and constantly. To scholars and academia, the study adds literature on food processing SCR while also contributing to existing theoretical framework. The study will also make suggestions for future research study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature presenting theories adopted under the subheading of theoretical framework. The second subsection presents literature on determinants of SCR

followed by empirical studies capabilities and SCR from a global, regional, and domestic perspective. The research gaps are identified from this empirical review and summarized in a conceptual framework.

2.2 Theoretical Framework

A theoretical framework is defined as the support or structure that describes and introduces the concepts under investigation in a research along with their definition and how these can be associated with existing literature on the subject and how other studies have used these concepts (Shepherd & Suddaby, 2017).

2.2.1 Dynamic Capabilities View

The dynamic capability view (DCV) elaborates the process of attaining SCA (Teece et al., 1997) and has been one of the widely adopted perspectives in strategic management recently (Schilke, 2014). Dynamic capabilities (DCs) allow companies to identify market changes and recognize market opportunities and enable firms to capitalize on these opportunities by deploying or redeploying their internal resources (Teece et al., 1997). According to (Teece, 2014), DCs establish a difference in firms' competitive positions in a similar sector and may not be matched across organisations as they are based on the individual company processes founded on their culture and employees.

The core of DCV is that companies make an attempt to shift from the present operational capabilities to reorganized capabilities. The DCV is widely perceived as a process associated with the ability of a firm to reconfigure the basis of its resources so as to respond efficiently in its field of operation. In addition, DCs are perceived to be focusing on the intentional shifts of resource basis. This leads to the different models of dynamic capabilities that have been used in operations management studies. Teece (2007) listed sensing, seizing, reconfiguring as dimensions while Eisenhardt and Martin (2000) defined dynamic capabilities as sensing, integrating, learning, and coordinating.

The DCV is used to understand the concept of competitive advantage as these capabilities have progressive effects on operational performance. DCs are created when individuals and teams use their knowledge and skills to acquire, integrate, and change resources available in the firm to competitive advantage (Morgan, 2012). In this study the dynamic

capabilities theory is adopted as it contributes to the identification of independent variables – absorptive, adaptive, and innovative capabilities of firms to navigate supply chain disruptions.

2.2.2 Relational View of the Firm

Dyer and Singh (1998) are credited to developing the relational view used to understand industry structure by focusing on competitive advantage through networks and dyads of firms as units of analysis. It assumes that partners invest in relational specific assets which have a huge probability for relational rents and among firms knowledge sharing routines. These relational competencies include managing supplier relationships initiatives, communication networks, and monitoring systems with a positive association to SCR (Blackhurst, Dunn, & Craighead, 2011).

In their study, Wieland and Wallenburg (2013) showed that relational view places foundation for comprehending how powerful relational competencies can enhance resilience in agility and robustness. The crucial parts of resilience are visibility and expectation and together can be enhanced by investing in procedures to share knowledge about pertinent changes in time before the change happens (Pettit, Fiksel & Croxton, 2010). Robustness can be attained by gaining knowledge about likely knowledge that will happen in the future while agility requires visibility to gain knowledge on the present changes that are occurring (Zsidisin & Wagner, 2010). Speed and preparedness are the other two critical aspects to attain resilience (Ponomarov & Holcomb, 2009). Robustness requires readiness so as to preserve stability while agility requires speed so as to achieve stability.

The relational view of the firm therefore insists that firms should be engaged in fostering more communication, cooperation, and integration so as to achieve agility as well as robustness dimensions of SCR. The theory has been successfully adopted in previous studies (Dubey et al., 2017; Kariuki, Ngugi, & Odhiambo, 2018) to explain the relationship between different factors and their role in achieving SCR.

2.3 Determinants of Supply Chain Resilience

There is a plethora of research that has identified different determinants of SCR among firms in different sectors from a global, regional, and local perspective. These studies are highlighted in this section of the introduction. In an empirical desk review of literature on SCR, Pettit, Fiksel, and Croxton (2019) distinguished determinants of SCR into vulnerability and capability factors. Vulnerability factors are those that may limit ability of the systems to resist and survive for the incoming disruptions while capability factors pose positive outcomes of SCR indicating that an increase in capabilities leads to the shrinking of the resilience triangle and thus less costs of disruptions.

In their study, Falasca, Zobel, and Cook (2008) listed three determinants of SCR as node criticality, complexity, and density. In another study done in the Thai, Pickert and Rittippant (2015) identified the determinants of SCR as investments in information management capabilities, cooperative organizational structures, anticipation and preparedness, and risk management capabilities. In China, Liu (2020) analyzed the four aspects of internal capabilities: robustness, resource redundancy, operation flexibility, and management of information in enhancing SCR with all these four having positive effects on SCR. Qui, Jin, Li, and Wang (2022) explored the association between outcomes, social, and process control mechanisms and SCR (proactive and reactive resilience) among Chinese firms finding that social and process control had positive effects on SCR while outcome control had no effect.

In India, Dubey et al. (2017) considered visibility, cooperation, and information sharing, trust and behavioural uncertainty as antecedents of SCR confirming supply chain cooperation, trust, and visibility had an effect on SCR. Rajagopal (2018) identified asset centralization, single sourcing, supply uncertainties, and lack of operational changes in response to disruptions as barriers for SCR among manufacturing firms in India. In another study done in India's automotive sector, Agarwal and Seth (2021) identified 11 barriers to SCR which were grouped into four clusters consisting of independent, linkage, dependent, and autonomous based on their dependent and driving power which assisted managers in tackling them strategically.

In South Africa, Neboh and Mbhele (2020) conceptualised the antecedents to consist of supply chain collaboration, reengineering, risk culture, and agility. In a study done in Kenya, Arani (2017) identified the enablers to building SCR as risk awareness, flexibility, supply chain reengineering and strategic sourcing establishing that all these factors were significant predictors of SCR. In another study done in the Petroleum industry, Lambaino et al. (2018) found that risk reduction strategies had a weak but positive effect on SCR.

According to Liu (2020), majority of research in supply chain has laid emphasis on the concepts, features, and significance of SCR from a theoretical lens with no in-depth investigation into the components or factors to enhance SCR in practice. There is a vital need in testing and proposing theoretical models so as to find precursors and costs of SCR. This study therefore aims to examine the factors that are identified in past literature on SCR focusing on the food processing firms in Kenya.

2.4 Empirical literature

In their study, Falasca, Zobel, and Cook (2008) incorporated node criticality, complexity, and density as a proposed decision support mechanism to evaluate SCR by adopting a simulation-based study design to assist in quantifying the relationship among disruptions in a supply chain. The study adopted characteristics at a strategic level. The study was proposing a model but does not indicate which of the three factors had an effect to SCR which this study aims to do. The study also relied on desk research to make inferences that were neither specific to any industry and thus conclusions may not be generalizable to manufacturing firms.

In Japan, Todo, Nakajima and Matous (2015) assessed how networks in supply chains affect firm resilience before and after an Earthquake. The outcome revealed that there were two contrasting effects of firm resilience of companies in the supply chain expansion networks. One, the more a company was connected in several supply chain networks, there was more probability of supply and demand disruptions which delayed recovery. Two, companies benefitted from diverse networks with clients and suppliers being able to substitute the surviving companies and acquire support from them.

In Thailand, Pickert and Rittippant (2015) explored resilience field by looking into impact of relational capabilities on performance and SCR. Resilience was categorized reactive or proactive and broken further into agility and robustness. The study collected data from 137 top management in supply chain management (SCM) and decision-making processes and tested using exploratory factor analysis (EFA). The study identified determinants of SCR as investments in information management capabilities, cooperative organizational structures, anticipation and preparedness, and risk management capabilities.

In Malaysia, Krishnan and Pertheban (2017) undertook an investigation into using SCR strategies concurrently as a dynamic capability looking at how companies ambidexterity lessen the negative consequences of disruptions of supply chain and enhance performance of the business. The sample consisted of 164 SMEs in manufacturing sector. Out of the findings, a dynamic SCR capability-building process was a precursor of supply chain performance; the study found that visibility, inventory management, diversification, and predefined decision plans as dynamic SCR capabilities. The sample consisted of SMEs which have different operational levels in comparison to large scale firms which will be included in this research.

Using the pharmaceutical manufacturing sector in Malaysia as a case, Aigbogun, Ghazali, and Razali (2014) investigated capabilities and vulnerabilities in supply chain by developing a framework for improving SCR by conducting a desk research approach as the first phase. The second phases consisted of conducting interviews with critical supply chain employee from seven firms. The study found that visibility, reserve capacity, flexibility, collaboration, supplier dispersity were critical for firms ability to proactively create a hardy supply chains capable to avoid risks and bounce back from any disruptions to mitigate as much as possible the vulnerabilities.

In a multi country study, Wieland and Wallenburg (2013) did a study on relational competencies for achieving SCR in in Switzerland, Germany, and Austria using a confirmatory method building from the relational view of the firm. The data was collected from 1,517 employees from SCM in small, medium and large companies and

analysed using structural equation modeling (SEM). Cooperative and communicative relationships had positive impact on resilience while integration did not have any effects.

In Qatar, Al Naimi, Faisal, and Sobh (2021) conducted an investigation into antecedents of resilience using information from SCR literature and gathering information from 253 firms to understand the role of the antecedents of SCR. The antecedents considered were culture of risk management, dexterity, association, integration, and supply chain reconfiguration. SCR was measured using eight measures of a seven point Likert scale. The sample consisted of managers and entities in the supply chain of selected firms. Agility, culture of risk management, and collaboration all had a positive effect on SCR while integration did not.

In the United Kingdom, Dubey et al. (2017) used the RBV and relational views to evaluate SCR in 250 manufacturing firms adopting a hierarchical moderated regression analysis. Collecting information from 780 material, supply chain, purchasing, and logistics managers; the antecedents of SCR were grouped into those from the RBV (connectivity in the supply chain, visibility, and sharing of information) and relational view (trust and cooperation). The findings revealed that trust, cooperation, and visibility all had a positive effect on SCR.

In South Africa, Neboh and Mbhele (2020) adopted a quantitative approach to investigate SCR among retail supermarkets selected via purposive sampling strategy and including 306 supervisors and managers in retail supermarkets. The antecedents' studies included technology advancement, business model, location, transport network, environmental changes, capacity, and political influence. After analysis, technology advancement, transport network, and changes in environment lead largely to indicators affecting SCR in the retail sector.

Using a different sector, Wasike (2014) assessed supply chain agility and information systems (IS) in the service industry at the Technical University of Kenya. Ninety six top, middle and lower level staff recruited and who recieved interview guides and questionnaires to collect data. Information systems service competence and Information Technology (IT) Services Management Skills were used as indicators of information

systems. Focusing on inputs, outputs, external influences, and internal operations were adopted as indicators for supply chain agility. The results confirmed importance of IS service competencies enhanced efficiency and speed while skills on managing network enhanced cooperative competencies. Data center management improved virtual integration which influenced quick service delivery in agility of a supply chain.

In a sample of manufacturing firms in Kenya, Arani (2017) adopted a mixed method design to investigate enhancers of SCR in a target population of 613 firms from which 62 firms were included into the sample size representing 14 industrial sectors. Supply reengineering, risk awareness, and operational flexibility were representative of enhancers while SCR was measured by market growth, profitability, and customer service. The study found out that strategic sourcing, supply chain re-engineering, operational flexibility and risk awareness were significant predictors of SCR.

Katsaliaki et al. (2020) identified and analyzed 951 studies based on their profile from the Web of Science (WoS) where practice and reactive strategies were identified. The proactive strategies adopted included maintaining redundancy (additional production capacity, high safety-stock), installing SCM software (transport, warehouse, management systems and vendor managed inventories), joint relationship efforts, decision synchronization, better coordination, demand forecasting, information sharing, and flexibility (alternative transportation depots, alternative suppliers for sourcing, and modes for delivery). The recovery stage strategies consisted of incorporating backup suppliers, buffer stocks, and redundant capacity to continue production.

2.5 Research Gap

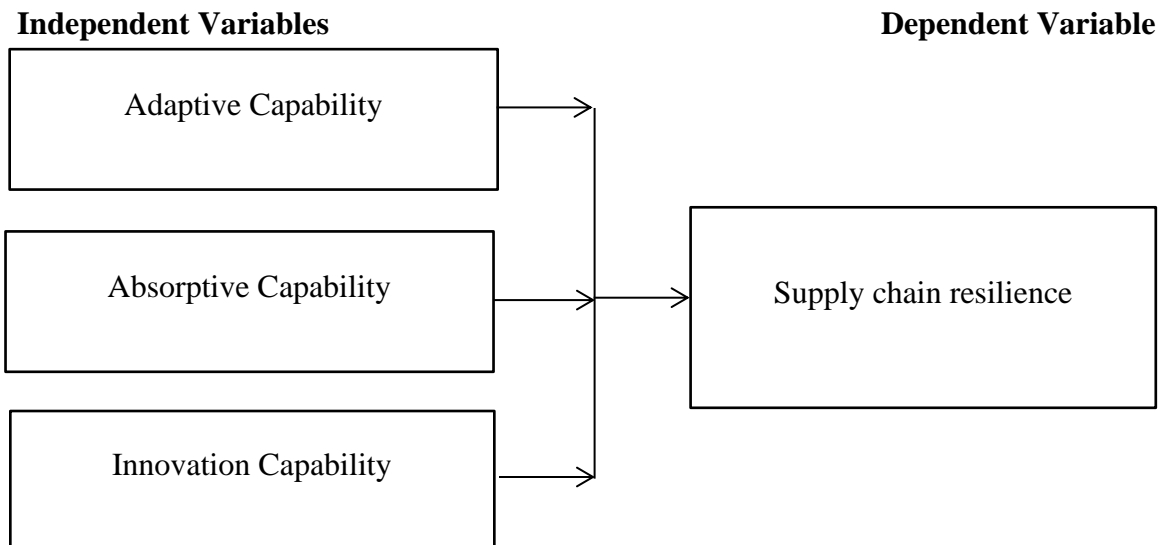
The review indicates abundant research on determinants of SCR among manufacturing firms exists; however, much of it predates the COVID-19 pandemic which was a global event that resulted in supply chain disruptions of huge proportions. The timeliness of this study is exploring SCR post-COVID-19 pandemic. Further, much of this research has been done from a global and regional perspective and less in the local manufacturing sector. Moreover, most research has identified that there are diverse factors that can influence SCR of firms; however, the dynamic capabilities approach has not been

extensively used to assess this relationship which is a gap that was filled by grouping the different factors into three determinants based on the dynamic capabilities model.

2.6 Conceptual Framework

Figure 2.1 shows independent variables which are the absorptive, adaptive, and innovation capabilities of firms which are hypothesized to influence the extent to which an organisation can be able to attain SCR as the dependent variable.

Figure 2.1: Conceptual Model



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides description of research methodology while outlining the justification for using these concepts. These include the research design, study population, data collection, and data analysis.

3.2 Research Design

A descriptive research design was adopted which aims to determine the context of a research problem while Nassaji (2015) states that the design is useful in classifying and drawing a research problem. Walliman (2011) defines the design in its ability to make observation by gathering data. Based on these definitions of the design, the design is suitable for this research as it collected data for observations so as to determine the present context of the subject under study, in this case, SCR in an effort to draw and classify the relationship between variables.

3.3 Study Population

The 102 firms in Nairobi County under the umbrella of food processing firms as defined by the Kenya Association of Manufacturers (KAM) are the units of analysis. The units of observation are materials managers, supply chain manager, logistics manager, and purchasing managers in each of the 102 firms making for a 408 target population. Sampling methods can be categorized into non-probability and probability methods. In the former, chances for inclusion into a sample size are known and are equal for all units in the sample; non-probability methods are however less scientific and random and are based on the discretion of a researcher. In this case, the probability sampling approach is used.

Stratified random sampling involves placing a population is identified into unique categories which are referred to as strata. It involves partitioning a population into subgroups from which even random samples are taken from each stratum (Al-Kateb & Lee, 2014). In this case, the strata were based on the different managers from each food processing in Nairobi County. Yamane (1967) sampling formula is used to determine 192 respondents as shown in Table 3.1. The formula was presented as:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = Sample size

N = Population

e = Acceptable sampling error

Table 3.1: Target Population and Sample Size

Respondents	Population	Sample size
Materials manager	102	48
Supply chain manager	102	48
Logistics manager	102	48
Purchasing manager	102	48
Total	408	192

Source: Kenya Association of Manufacturers (2022).

3.4 Data Collection

The researcher used a structured questionnaire designed of close-ended and Likert scale items for the demographic information and variable information respectively. The sections consisted of: demographic information on respondents (manager position, work experience, education level), adaptive capability, absorptive capability, innovation capability, and SCR as shown in Table 3.2.

Table 3.2: Operationalization of variables

Variables	Type of variable	Indicators	Scale
Adaptive capability	Independent	<ul style="list-style-type: none"> • Tracking goods • Information systems • Monitoring operations • Information sharing 	5-point Likert scale
Absorptive capability	Independent	<ul style="list-style-type: none"> • Risk management • Employee training • Knowledge creation • Firm integration 	5-point Likert scale

Innovation capability	Independent	<ul style="list-style-type: none"> • Firm sensitivity • Firm response • Risk awareness • Searching for new opportunities 	5-point Likert scale
Supply chain resilience	Dependent	<ul style="list-style-type: none"> • Operation continuity • Coping with disruption • Quick response to disruption • Disruption preparation • Learning from disruptions 	5-point Likert scale

Source: Researcher (2022)

3.5 Data Analysis

Upon completing data collection, the information was put into statistical software for analysis conducted in two steps. The first step was using descriptive statistical tools to summarize the data to make it easier to identify trends and make meaning of the streams of data collected. These included using mean and standard deviation for the Likert scale items and frequency distributions for the close-ended data. This was followed by conducting Pearson's (*r*) correlation to measure association while multiple linear regressions were adopted to determine causal relationships. The model was thus:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

α = Autonomous function

ε = Error term

$\beta_1, \beta_2,$ and β_3 = Slope of the function of each function attribute

Y = Supply chain resilience

X_1 = Adaptive capability

X_2 = Absorptive capability

X_3 = Innovation capability

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents data in tables and interpretations by the researcher. It consists of different subsections including that of the response rate, demographic information, descriptive findings and inferential findings.

4.2 Response Rate

The response rate achieved was 73.9 percent which means 142 of 192 questionnaires were returned as shown in Table 4.1. This is deemed acceptable based on Mugenda and Mugenda (2019) recommendation for researchers to attain at least a 50.0 percent response rate.

Table 4.1 Response Rate

Category	Frequency	Percent
Administered questionnaires	192	100.0
Returned questionnaires	142	73.9
Non-response	50	26.1

4.3 Demographic Information

This section presents demographic features of the sample which is important so as to identify those that the findings can be generalized to. The age, education, and experience of respondents are thus presented herein.

4.3.1 Age

In terms of their ages, the findings indicate that 57.7 percent were in the 47 – 57 age group followed by 19.0 percent who indicated being 58 years and above. The least represented age group was between 25 – 35 years and accounted for 2.1 percent while 21.1percent were in the 36-46 age groups.

Table 4.2: Respondents' Age

Age in years	Frequency	Percent
25-35	3	2.1
36-46	30	21.1
47-57	82	57.7
58 and above	27	19.0
Total	142	100.0

4.3.2 Education

Most respondents had a postgraduate level of education as shown by 74.6 percent followed by 16.2 percent who had a diploma level and 9.2 percent having an undergraduate degree as illustrated in Table 4.3.

Table 4.3: Respondents' Education Level

Education	Frequency	Percent
Undergraduate	13	9.2
Postgraduate	106	74.6
Diploma	23	16.2
Total	142	100

4.3.3 Work experience

Table 4.4 shows the experience of respondents where more respondents had 5 – 10 years' experience in their current position accounted for 35.9 percent of the sample followed by 26.1 percent with 11-15 years' experience. Those with 16 – 20 years' experience represented 24.6 percent while 13.4 percent had less than 5 years' experience.

Table 4.4 Respondents' experience

Experience	Frequency	Percent
Less than five years	19	13.4
5 - 10 years	51	35.9
11-15 years	37	26.1
16-20 years	35	24.6
Total	142	100.0

4.4 Descriptive Statistics

4.4.1 Supply Chain Resilience

Supply chain resilience was measured by six statements; based on their response, the overall mean score was 3.90 which indicate moderate agreement with the statements. Nevertheless, respondents indicated agreement that their organisation was able to handle changes and make rapid responses to supply chain disruptions as shown by a mean score of 4.87 and 4.91 respectively. Table 4.5 shows that respondents were in moderate agreement with the other statements on supply chain preparation, supply chain shifts, capacity to uphold functionality, and capacity to retrieve knowledge.

Table 4.5: Supply chain resilience descriptive statistics

Supply chain resilience	N	Mean	Std. Dev.
The organisation is able to handle changes brought by supply chain disruptions	142	4.87	0.362
The organization is able to make rapid responses to supply chain disruptions	142	4.91	0.335
The organization's supply chain is adequately prepared to address disruptions effects on financial outcomes	142	3.42	1.284
The organization's supply chain can shift to a new state after experiencing disruption	142	3.29	1.102
The company's supply chain has capacity to uphold the expected degree of functionality in a disruption	142	3.25	1.244
The company's supply chain has the capacity to retrieve significant knowledge after a disruption	142	3.67	1.103
Overall mean score		3.90	0.905

4.4.2 Absorptive Capability and Supply Chain Resilience

The first independent variable was absorptive capability which was measured using six statements measured at a five-point Likert scale. Respondents agreed with absorptive capability statements as shown by an overall mean score of 4.33 and standard deviation of 0.821 as seen in Table 4.6. However, respondents were in moderate agreement that members in the supply chain had information for monitoring operations strategy as shown by a mean score of 3.89 and 0.831 standard deviation implying that respondents did not feel confident of the sharing information with other actors in their supply chain and this needed some improvement.

Table 4.6: Absorptive capability descriptive statistics

Absorptive capability	N	Mean	Std. Dev.
Members in our supply chain have systems that allow for tracking of goods	142	4.44	0.821
Members in our supply chain possess information for monitoring operations strategy	142	3.89	0.831
Members in our supply chain possess information for changing their operations strategy	142	4.47	0.823
The organisation has implemented information systems to help in sharing information with members in our supply chain	142	4.28	0.910
The organisation is effective in sharing information on its operations with our suppliers	142	4.51	0.760
The organisation is effective in sharing information on its operations with our customers	142	4.41	0.782
Overall mean score		4.33	0.821

4.4.3 Adaptive capability and supply chain resilience

Adaptive capability was measured by eight statements measured on five-point Likert scale. Out of the responses, the overall mean score was 3.95 attained which means moderate agreement with adaptive capability statements. Though, respondents disagreed that their organisations used different strategies to share knowledge on risk management and that risk management was included in training of personnel as shown by a mean score of 2.63 and 2.49 respectively. Table 4.7 shows that respondents agreed to other statements.

Table 4.7: Innovation capability descriptive statistics

Innovation capability	N	Mean	Std. Dev.
There are different strategies used by the organisation to motivate staff to share knowledge on risk management	142	2.63	1.574
The organisation includes risk management as a significant subject in training of new personnel	142	2.49	1.452
The organization provides training to on required actions when a disruptive events take place	142	4.42	0.819
The organisation has the ability to acquire, integrate, transform, and use knowledge existing in the organisation	142	4.32	0.910
The organisation has the ability to generate new capabilities by deploying available resources	142	4.53	0.721
The integration with upstream supply chain members enhances operation flexibility	142	4.54	0.721
The integration with downstream supply chain members enhances operation flexibility	142	4.47	0.691
The organisation has been successful in integrating suppliers' operations through company information platforms	142	4.18	0.909
Overall mean score		3.95	0.975

4.4.4 Adaptive Capability and Supply Chain Resilience

The third variable for the study was adaptive capability which was measured by eight statements measured at a five-point Likert scale. Table 4.8 shows an overall mean score of 4.69 indicating respondents' agreement with all statements as they all had a mean score of 4 and above with this variable having the highest mean score among the three independent variables. This result implies that organisations paid more attention to their ability to adapt so to maintain their supply chain which can be attributed to the volatility of food processing.

Table 4.8: Adaptive capability descriptive statistics

Innovation capability	N	Mean	Std. Dev.
The organisation is sensitive to the opportunities in the business environment	142	4.78	0.447
The company has sense of likely threats in a business environment	142	4.47	0.681
The company possesses capability of responding rapidly to changes in the market	142	4.76	0.475
The organisation has the constant ability to explore for new opportunities in the market	142	4.74	0.501
The organisation enjoys the dynamic match among its capabilities and the changing environment	142	4.61	0.606
The organisation is continuously aware of the risks in the changing business environment	142	4.69	0.535
The organisation has the capability to be prepared for unexpected events in the future	142	4.70	0.530
The organization has the capability to maintain continuous operations at expected levels of control	142	4.78	0.507
		4.69	0.535

4.5 Inferential Statistics

4.5.1 Correlation Analysis

Table 4.9 summarizes the results from the correlation analysis which indicate positive and significant associations between the three independent variables and supply chain resilience. The results indicate that absorptive capability had a 0.103 correlation with supply chain resilience and this was significant ($p < 0.05$). Innovation capability had a 0.098 correlation with supply chain resilience and this was significant ($p < 0.05$). Similarly, adaptive capability had a 0.086 correlation with supply chain resilience and this was significant ($p < 0.05$).

Table 4.9: Correlation Analysis

Variables		Absorptive Capability	Innovation Capability	Adaptive Capability
Absorptive Capability	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	142		
Innovation Capability	Pearson Correlation	0.126	1	
	Sig. (2-tailed)	0.135		
	N	142	142	
Adaptive Capability	Pearson Correlation	.563**	0.077	1
	Sig. (2-tailed)	0.000	0.361	
	N	142	142	142
Supply Chain Resilience	Pearson Correlation	0.103	0.098	0.086
	Sig. (2-tailed)	0.022	0.024	0.031
	N	142	142	142

4.5.2 Regression Analysis

The output from multiple regression analysis is summarized in Table 4.10 where the model summary indicates the R^2 is 0.567 which means that the independent variables explained a total of 56.7 percent variation on SCR and this was significant ($p < 0.05$). The results from the coefficients indicate that innovation capability had a 0.194 effect on SCR and this was significant ($p < 0.05$). Absorptive capability had a 0.114 effect on SCR and this was significant ($p < 0.05$) while adaptive capability had a 0.032 effect on SCR and this was significant ($p < 0.05$). These findings indicate that an increase in absorptive capability, innovation capability, and adaptive capability would result in an increase in supply chain resilience.

Table 4.10: Regression coefficients

Model	R	R Square	Adjusted R Square	Std. Error of Estimate		
1	.753a	0.567	0.002	0.6474		
ANOVA ^a						
		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.381	3	0.46	1.098	.035 ^b
	Residual	57.839	138	0.419		
	Total	59.22	141			
Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.018	1.032		3.892	0.000
	Absorptive Capability	0.114	0.110	0.108	1.04	0.030
	Innovation Capability	0.194	0.152	0.110	1.275	0.020
	Adaptive Capability	0.032	0.204	0.016	0.157	0.008

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of results, conclusions, and makes recommendations for action as well as suggesting areas of future study. In each of these subsections, the information is provided as per the research objectives.

5.2 Summary of Key Findings

In objective one, the findings indicate that respondents were in agreement with the statements as shown by an overall mean score of 4.33 and standard deviation of 0.821. The findings revealed a positive and significant association between absorptive capability and supply chain resilience. The results showed that absorptive capability had the second highest effect on SCR.

On objective two, the overall mean score was 3.95 and 0.975 standard deviation which means respondents were in moderate agreement with innovation capability statements. The findings revealed a positive and significant association between innovation capability and supply chain resilience. The results showed innovative capability had the highest effect on SCR.

Under objective three, an overall mean score of 4.69 and standard deviation of 0.535 was found indicating respondents' agreement with adaptive capability statements. The findings revealed a positive and significant association between adaptive capability and SCR. The results showed that adaptive capability had the least effect on SCR.

5.3 Conclusion

Based on the finding, the study concludes that absorptive capability has a positive effect on supply chain resilience of food processing firms. On objective two, the findings indicate a positive effect of innovation capability on SCR; it is this study's conclusion that innovation capability had the greatest effect on supply chain resilience of food processing firms. Under objective three, the study concludes that adaptive capability had the least effect on supply chain resilience of food processing firms in Nairobi County.

5.4 Recommendations

The study recommends that food processing firms to provide continuous training to their staff on risk management so as to promote a culture in which risks are anticipated and strategies for responding to these risks can be proposed from the staff so as to enhance the organizations' supply chain resilience. Secondly, there is need for food processing firms to motivate staff to share knowledge within the organisation on risk management so as to promote knowledge sharing during supply chain disruptions and thereby enhance the capacity of the supply chain to be resilient during any future operational crisis that may arise.

5.5 Areas of Further Study

This study examined the determinants of supply chain resilience among food processing firms in Nairobi County, Kenya. Out of the three independent variables, the results indicate that innovation capability had the greatest effect on supply chain resilience of food processing firms. The study suggests for further research on influence of innovation capability on supply chain resilience in food processing firms and other sectors.

REFERENCES

- Agarwal, N., & Seth, N. (2021). Analysis of supply chain resilience barriers in Indian automotive company using total interpretive structural modelling. *Journal of Advances in Management Research*, 18(5), 758-781.
- Aigbogun, O., Ghazali, Z., & Razali, R. (2014). A framework to enhance supply chain resilience the case of Malaysian Pharmaceutical industry. *Global Business and Management Research*, 6(3), 219-228.
- Al Naimi, M., Faisal, M. N., & Sobh, R. (2021). Antecedents and consequences of supply chain resilience and reconfiguration: an empirical study in an emerging economy. *Journal of Enterprise Information Management*, 34(6), 1722-1745.
- Al-Kateb, M., & Lee, B. S. (2014). Adaptive stratified reservoir sampling over heterogeneous data streams. *Information Systems*, 39, 199–216.
- Arani, W. N. (2017). *Enhancers for Building Supply Chain Resilience in Manufacturing Firms in Kenya*. Unpublished research project. Jomo Kenyatta University of Agriculture and Technology Nairobi. Kenya.
- Blackhurst, J., Dunn, K. S., & Craighead, C. W. (2011). An empirically derived framework of global supply resiliency”, *Journal of Business Logistics*, 32(4), 374–391.
- Chaidilok, W. (2017). *A Framework of Factors Affecting Supply Chain Flood Resilience*. Unpublished thesis, Thammasat University. Bangkok, Thailand.
- Dubey, R., Gunasekaran, A., Childe, S. J., Papadopoulos, A., Blome, C., & Luo, Z. (2017). Antecedents of resilient supply chains: An empirical study. *IEEE Transactions on Engineering Management*, 99, 1-12.
- Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of inter-organizational competitive advantage. *Academy of Management Review*, 23(4), 660–679.
- Eisenhardt, K. M., & Martin, J. (2000). Dynamic Capabilities: What Are They? *Strategic Management Journal*, 21, 1105-1121.

- Falasca, M., Zobel, C. W., & Cook, D. (2008). *A Decision Support Framework to Assess Supply Chain Resilience*. In F. Fiedrich & B. Van de Walle (Eds.), Proceedings of the 5th international ISCRAM conference (pp. 596–605).
- Falasca, M., Zobel, C., & Cook, D. F. (2008). *A decision support framework to assess supply chain resilience*. Proceedings of the 5th International ISCRAM Conference – Washington, DC, USA, 596-605.
- Gitonga, M .M. (2021). *Supply chain resilience and operational Performance of Manufacturing small and medium enterprises operating within the Industrial area Nairobi County*. Unpublished research project. Jomo Kenyatta University of Agriculture and Technology Nairobi. Kenya.
- Kariuki, J. N., Ngugi, N., & Odhiambo, R. (2018). Influence of Supply Chain Resilience on Performance of Categorized Hospitals in Kenya. *European Journal of Logistics, Purchasing and Supply Chain Management*, 6(1), 38-52.
- Katsaliaki, K., Galetsi, P., & Kumar, S. (2020). Supply chain disruptions and resilience: a major review and future research agenda. *Annals of Operations Research*, 8(1), 1-38.
- Kenya Institute of Public Policy Research and Analysis (2020). *Kenya Economic Report 2020*. Nairobi: Kenya Institute of Public Policy Research and Analysis.
- Kenya Institute of Public Policy Research and Analysis (2021). *Kenya Economic Report 2021*. Nairobi: Kenya Institute of Public Policy Research and Analysis.
- Kenya National Bureau of Statistics (2021). *Economic Survey 2021*. Nairobi: Kenya national Bureau of Statistics.
- Kosgey, P. (2021). Effect of Supply Chain Resilience on Organizational Performance among Selected Manufacturing Firms in Nairobi, Kenya. *International Journal of Research and Innovation in Social Science*, 5(10), 418-422.
- Krishnan, S., & Pertheban, T. (2017). Enhancing Supply Chain Ambidexterity by Adapting Resiliency. *Journal of Logistics Management*, 6(1), 1-10.
- Lambaino, N. K., Guyo, W., Odhiambo, R., & Getuno, P. (2018). Risk Reduction Strategies and Supply Chain Resilience in the Petroleum Industry in Kenya. *International Journal of Economics, Commerce and Management*, 6(7), 628-634.

- Liu, Z. (2020). *Achieving Supply Chain Resilience to Improve Performance under a Global Sourcing Context*. University of North Georgia. Dahlonega. Georgia.
- Mikhail, M., El-Beheiry, M., & Afia, N. (2019). Incorporating resilience determinants in supply chain network design model. *Journal of Modelling in Management*, 14(3), 738-775.
- Morgan, N. A. (2012). Marketing and business performance. *Journal of the Academy of Marketing Science*, 40(1), 102-119.
- Muricho, M. W., & Muli, S. (2021). Influence of Supply Chain Resilience Practices On the Performance of Food and Beverages Manufacturing Firms in Kenya: A Survey of Nairobi City County. *International Journal of Business and Social Research*, 11(1), 36-55.
- Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, 19(2), 129-132.
- Neboh, N. D., & Mbhele, T. P. (2020). Supply Chain resilience and design in retail supermarkets. *Journal of Contemporary Management*, 17(2), 51-73.
- Ochieng, O. A. (2018). Supply Chain Resilience and Organizational Performance of Pharmaceutical Manufacturing Companies in Nairobi. Unpublished research project. University of Nairobi. Nairobi. Kenya.
- Pettit, T. J., Fiksel, F., & Croxton, K. L. (2010). Ensuring Supply Chain Resilience: Development of Conceptual Framework. *Journal of Business Logistics*, 31(1), 1-21.
- Pettit, T. J., Fiksel, J., & Croxton, K. L. (2010). Ensuring supply chain resilience: development of a conceptual framework. *Journal of Business Logistics*, 31, 1–21.
- Pickert, C. A., & Rittippant, N. (2015). Supply Chain Resilience – Influence of Supply Chain Capabilities and Strategies on Agility and Robustness. 323-332
- Ponomarov, S.Y., & Holcomb, M.C. (2009). Understanding the concept of supply chain resilience. *The International Journal of Logistics Management*, 20, 124-143.
- Qui, L., Jin, Z., Li, Y., & Wang, Y. (2022). Effects of control mechanisms on supply chain resilience and sustainability performance. *Australian Journal of Management*. <https://journals.sagepub.com/doi/abs/10.1177/03128962211066532>
- Rajagopal, R. (2018). Measuring the barriers to resilience in manufacturing supply chains using Grey Clustering and VIKOR approaches. *Measurement*, 126, 259-273.

- Schilke, O. (2014b). Second-order dynamic capabilities: How do they matter? *The Academy of Management Perspectives*, 28(4), 368-380.
- Shepherd, D. A., & Suddaby, R. (2017). Theory Building: A Review and Integration. *Journal of Management*, 43, 59-86.
- Teece, D. J. (2007). Explicating Dynamic Capabilities: The nature and micro foundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28, 1319–1350.
- Teece, D. J. (2014). The Foundations of Enterprise Performance: Dynamic and Ordinary Capabilities in an (Economic) Theory of Firms. *The Academy of Management Perspectives*, 28(4), 328-352.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Todo, Y., Nakajima, K., & Matous, P. (2015). How Do Supply Chain Networks Affect the Resilience of Firms to Natural Disasters? Evidence from the Great East Japan Earthquake. *Journal of Regional Science*, 55(2), 209-229.
- Walliman, N. (2022). *Research Methods the Basics* (3rd ed). London, UK: Routledge.
- Wamalwa, H., Kamau, P., & McCormick, D. (2020). How Do Food Processing Firms In Kenya Learn? Empirical Insights from Potato Processing In Nairobi. *DBA Africa Management Review*, 10(5). 79-96.
- Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: a review and research agenda. *International Journal of management reviews*, 9(1), 31-51.
- Wasike, J. N. M. (2014). Role of Information Systems Competence in Supply Chain Agility in Service Industry Case of Technical University of Kenya. *The strategic journal of business change & management*, 2(25), 475-494.
- Wieland, A., & Wallenburg, M. C. (2013). The influence of relational competencies on supply chain resilience: a relational view. *International Journal of Physical Distribution & Logistics Management*, 43(4), 300-320.
- Yamane, T. (2017). *Statistics: An Introductory Analysis* (2nd Ed). New York, NY: Harper and Row.

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.

APPENDICES

APPENDIX 1: RESEARCH QUESTIONNAIRE

Section A: Demographic Information

1. Gender

Male []

Female []

2. Age

25 – 35 []

36 – 46 []

47 – 57 []

58 or Above []

3. Level of education

Diploma []

Undergraduate degree []

Postgraduate degree []

4. Years of experience

Less than 5 Years []

5 – 10 []

11 – 15 []

16 – 20 []

More than 20 Years []

Section B: Absorptive Capability

The following statements reflect the absorptive capability of your firm. Based on a five point scale, please indicate to what extent you agree with these statements. Where: 1-strongly disagree, 2-disagree, 3- moderately agree, 4-agree, 5-strongly agree

Absorptive capability statements

1 2 3 4 5

6 Members in our supply chain have systems that allow for tracking of goods

7 Members in our supply chain possess information for monitoring

operations strategy

- 8 Members in our supply chain possess information for changing their operations strategy
- 9 The organisation has implemented information systems to help in sharing information with members in our supply chain
- 10 The organisation is effective in sharing information on its operations with our suppliers
- 11 The organisation is effective in sharing information on its operations with our customers

Innovation Capability statements

- 12 There are different strategies used by the organisation to motivate staff to share knowledge on risk management
- 13 The organisation includes risk management as a significant subject in training of new personnel
- 14 The organization provides training to on required actions when a disruptive events take place
- 15 The organisation has the ability to acquire, integrate, transform, and use knowledge existing in the organisation
- 16 The organisation has the ability to generate new capabilities by deploying available resources
- 17 The integration with upstream supply chain members enhances operation flexibility
- 18 The integration with downstream supply chain members enhances operation flexibility
- 19 The organisation has been successful in integrating suppliers' operations through company information platforms

Adaptive Capability statements

- 19 The organisation is sensitive to the opportunities in the business environment

- 20 The company has sense of likely threats in a business environment
- 21 The company possesses capability of responding rapidly to changes in the market
- 22 The organisation has the constant ability to explore for new opportunities in the market
- 23 The organisation enjoys the dynamic match among its capabilities and the changing environment
- 24 The organisation is continuously aware of the risks in the changing business environment
- 25 The organisation has the capability to be prepared for unexpected events in the future
- 26 The organization has the capability to maintain continuous operations at expected levels of control

Supply Chain Resilience statements

- 27 The organisation is able to handle changes brought by supply chain disruptions
- 28 The organization is able to make rapid responses to supply chain disruptions
- 29 The organization's supply chain is adequately prepared to address disruptions effects on financial outcomes
- 30 The organization's supply chain can shift to a new state after experiencing disruption
- 31 The company's supply chain has capacity to uphold the expected degree of functionality in a disruption
- 32 The company's supply chain has the capacity to retrieve significant knowledge after a disruption

Thank You for Your Participation