COVID 19 INDUCED SUPPLY CHAIN DISRUPTIONS AND BUSINESS RESILIENCE OF FOOD AND BEVERAGE MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

BY

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DECLARATION

This research project is my own original work and to the best of my knowledge it has not been submitted for any academic award in any other institution.

…… …… ……20/11/2023……..

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D61/76067/2012

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This research project has been submitted to me for examination as the university supervisors.

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DEDICATION

I would like to dedicate this work wholeheartedly to my incredible family. To my husband and best friend, Kenneth Mwangi, your unwavering encouragement has been my driving force, ensuring that I give my all to complete what I started. Your support means everything to me.

To my beautiful girls, Keisha, Kayra, and Kendra, this is for you. May this serve as a reminder to always work hard in everything you do and never give up. Your mom is here cheering you on, every step of the way.

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ABBREVIATIONS AND ACRONYMS

Covid-19	Corona Virus Disease 2019
F&B	Food and Beverage
KAM	Kenya Association of Manufacturers
SPSS	Statistical Package for Social Sciences
UNIDO	United Nations Industrial Development Organization
USA	United States of America
SCM	Supply Chain Management

ABSTRACT

The Covid-19 pandemic caused huge disruptions in global and domestic businesses as countries and borders were closed to contain the spread of the virus. This means companies' supply chain resilience was tested. Hence, this study investigated the impact the supply chain disruptions induced by covid -19 had on business resilience among the food and beverage manufactures in Nairobi County, Kenya. The objectives were formulated, and these were to: establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County and to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County. The theoretical framework for the study was based on dynamic capabilities and systems theory with dynamic capabilities being the main theory used. Descriptive research was employed in the research design and the population was made up of all food and beverages firms in Nairobi County which are 104. Primary data was used which was acquired via questionnaire (administered via electronic google forms and physically to the firms). For objective one (To establish the extent of Covid 19 induced supply chain disruption, in food and beverage manufacturing firms in Nairobi County) descriptive statistics was applied. To attain objective two (to find out the impact of covid 19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, regression, and correlation analyses was applied. On the 1st Objective which was to find out the extent of Covid-19 induced supply chain disruptions among food and beverage manufacturing firms, it was affirmed that firms have adopted all indicators of supply chain disruption in the downstream, internal, and upstream operations to a large scale. Objective two determined that downstream operations had the highest influence on all the variables measured for business resilience that is flexibility, timeliness collaboration and digitization, followed by internal operations then upstream operations. The study concluded that Covid-19 induced supply chain disruptions had been applied to a large extend and they had a significant impact on business resilience. It is recommended that firms increase investment in digitization tools to facilitate operational innovation in the supply chain to overcome the current cross-boundary challenges experienced in the foods sector which provides raw materials for many of the industries. Food and beverages firms should train their employees on the need to take up significance of implementing supply chain disruptions The research was limited since it focused on food and beverages firms in a single county and moreover, the study solely relied on Covid-19 as one of the global pandemic that induced supply chain disruptions. Moreover, future studies should focus on similar research in different sectors and expand the scope of global pandemics beyond Covid-19 to determine their impact on supply chain disruptions and business resilience.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Supply chain disruptions have gained a lot of relevance among scholars and supply chain managers across the world. As it has been noted with the Covid -19 pandemic, emerging pandemic threats have had a global spread and caused a ripple effect through numerous economies as identified by Eastwood (2022). Globally, all economic segments are interconnected through a complex network of effective supply chain networks (Choi, 2020). However, with the onset of the Covid-19 disease, the global economic activities came to a standstill with the World Bank and other major institutions signalling an occurrence of economic recession was underway (Lucchesse & Mario, 2020). Haren and Simchi-Levi (2020) reported that the Covid-19 had a great impact on global supply chain and manufacturing operations which has led to continuous disruptions in the flow of goods and provision of services. Mehrotra, Hamed, Masoud, Fengqiao, and Karolina (2020) noted that the Covid-19 pandemic has exposed the weaknesses in the global supply chain; which calls into action organizations to plan for a multi-year horizon that will help to minimize future disruptions in the supply chain.

The link connecting supply chain disruptions to business resilience can theoretically be supported by the dynamic capabilities' theory and systems theory. The dynamic capabilities theory can be used to explain the research. The idea, which was originally advanced by Teece and Pisano (1994), emerged from the resource-based view (RBV) proposed by Barney (1991). It is focused on the company's capacity to integrate, reconfigure, and grow external and internal competencies in order to respond to environments that are fast changing. These capabilities are vital to supporting the firm wither any disruptions on their operations emanating from the Covid-19 pandemic. Further, systems theory expounds on how various

ideologies within the firm can be a function of the various systems and levels within the organization (Haddad, Chellaboina, & Nersesov, 2012). The theory holds that the organization is interrelated and changes in the environment may have a ripple effect in the firm. Thus, for the organization to maintain a balance in its operations, it should be able to adapt to environmental changes (Kaviani, Mobin, & Bottani, 2016). The current research scope is concerned with how the firm's supply chain disruptions has been impacted by Covid-19 pandemic.

In both developed and developing countries of the world, Food and Beverage (F&B) manufacturing companies have proved to be prominent in terms of employment and added value to the gross domestic product (Raimo, N., de Nuccio, E., Giakoumelou, A., Petruzzella, F., & Vitolla, F. (2020). The United States (US) is characterized by high technology and management competencies, making it more adept at adopting new technologies. As a result, it often leads the way for other F&Bs (Food and Beverage businesses) around the world. (Geylani, Kapelko, & Stefanou, 2021). Food and beverage production in Kenya is the largest sector in the Kenya Manufacturing Association. It constitutes the following sub-sectors: Alcoholic Beverages & Spirits, Non-Alcoholic Beverages, Baked products and other processed cereals, Confectionary, snack foods, spreads, and condiments, Dairy and dairy derivatives, Meat and fish products, Edible Oil and Salt Sub-Sector (KAM, 2023).

The segment contributes about 10 % of the Gross Domestic Product (GDP) to the economy (Wanja & Achuora, 2022). This study therefore focused on the up-stream and down-stream process that majorly deals with ensuring that the raw materials are received by the manufacturer and the goods produced are available to customers, thus the need for effective supply chain disruptions risks mitigation.

1.1.1 Covid 19 Induced Supply Chain Disruptions

The Covid-19, also known as coronavirus pandemic, was a world-wide outbreak of coronavirus disease 2019. The worldwide outbreak was classified as an international public health emergency by the World Health Organization (WHO) on January 30, 2020, and a pandemic on March 11, 2020 (WHO, 2020). On the other hand, supply chain disruptions refer to a breakdown in the manufacturing flow of goods and their delivery to customers. One of the most critical problems that supply chain managers face in current times where the world is globalized and extremely volatile business environments, is how to respond proactively to interruptions that could damage the complex supply networks as averred by Mehrotra and Ray (2012). During the covid-19 pandemic, most organizations were faced with imminent supply chain breakdown as a result of stay-at-home orders and disruptions of global logistic processes (Ivanov, 2020b). Ivanov and Dolgui (2020) argue that firms need to develop long-term plans that will support sustainable practices resilience of supply chain, and agility within the firm which can help in limiting the impact of pandemic disruptions to manufacturing entities. Currie, John, Kathy-Kotiadis, Monks, Stephan, and Duncan (2020), note that organizations had to focus on changing their logistic services, adopting information technology, better employee management, and changes to their manufacturing processes to overcome the disruptions brought by Covid-19. A report by TRACC Group (2020), the European alcohol industry, has been deeply disrupted by Covid-19 which has contributed to the distillers reconfiguring their value chains in order to sustain their operations. The report indicates that the pandemic led to supply chain disruptions which, has inturn led to unpredictability in production, lack of efficiency in the distribution chain and disrupted purchasing patterns.

In Kenya, Nyang'au (2016) noted that with disruption in the supply chain, there is need for the firm to employ proactive strategies that will aid in the management of the supply chain

disruptions and vulnerabilities faced by the firm. Goldbeck, Angeloudis, and Ochieng (2020) indicated that with the onset of the pandemic, firms have been developing supply chain resilience through the adoption of new technologies, supplier integration, and supply risk management. Euro Monitor (2021) noted that Covid-19 has negatively affected the volume of alcohol sales in Kenya due to the instituted lockdown measures across the country. Further, despite alcoholic firms shifting to ecommerce retailing, the on-trade channels have not significantly improved the level of sales for retailers and manufacturing companies. As such, most manufacturers have been aligning their distribution patterns to focus on both on-trade and off-trade sales channels to drive the revival of the industry. The current study examined supply chain disruptions during Covid-19 in terms of upstream operations, internal operations and downstream operations to bring out the full spectrum of interruptions in the supply chain.

1.1.2 Business Resilience

Prior to the Pandemic, supply chains thrived due to drivers such as cost reduction and enhancement of productivity. Even though such drivers remain important, the unexpected disruptions caused by Covid-19 endangered the competitive position of countless business that could no longer meet expectations of their customers. This has forced companies to shift the focus to building business resilience as highlighted by (McKinsey 2021).

Resilience is defined by Efendi, Zulmi, and Rangkuty (2021) as a measurement of an organization's capacity to return to the status quo in the shortest possible period of time. Resilience is viewed by Dahles and Susilowati (2015) as a crucial notion for organizations while dealing with a disaster. Business resilience framework within manufacturing entities may be assessed based on operational, community, financial, and commercial resilience (Efendi, et al, 2021). KPMG report (2021) indicates that the operational resilience of the firm focuses on maintaining its potential in dictating how operationally it can survive in the

market. This research focused on the operational resilience of the food and beverage manufacturing firms in Nairobi County, Kenya. Disruptions can immediately impact the operations of the firm and the following metrics were considered in the survey; flexibility, timeliness, collaboration and digitization as measures of business resilience.

Flexibility is required when businesses or organizations encounter unforeseen events, like the Covid-19 pandemic outbreak (Liu, Yi, & Yin, 2021). Companies' ability to adapt to disruptions can be influenced by their ability to be flexible or rigid. According to Jain, Kashiramka, and Jain (2020) and Sushil (2017), business flexibility is the ability of a company to adapt to unpredictable or uncertain situations.

Timeliness is the capability of a company to quickly respond to demands of the customer by adjusting to short lead times as argued by Vencataya, Seebaluck, and Doorga (2016). Further McKinsey (2021) explains that timeliness is also likely to be a central feature of what happens next, and it will need to be attained through deliberate design. As stated by Whipple and Russell (2007), the establishment of partner synergies, joint planning, and encouragement of real-time information interchange are all necessary for preparing for, responding to, and recovering from supply chain disruptions while minimizing their impacts.

Effective supply chain collaboration is paramount for building resilience in today's volatile business landscape. As emphasized by Christopher, M., Peck, H., & Towill, D. R. (2006) in their seminal work, collaborative efforts among supply chain partners enable the efficient sharing of information, resources, and expertise. This collaborative approach facilitates quicker responses to disruptions, enhances adaptability, and strengthens overall supply chain resilience. Businesses that prioritize collaborative strategies foster a culture of cooperation and mutual support, creating a foundation for navigating uncertainties and maintaining operational continuity.

Finally, the digitization of supply chains has emerged as a transformative strategy for enhancing business resilience. Leveraging digital technologies in supply chain management allows for real-time visibility, predictive analytics, and agile decision-making, as highlighted by Ivanov, D., Dolgui, A., & Sokolov, B. (2018). Through their work, the authors emphasize how digitization enables organizations to optimize operations, respond swiftly to disruptions, and enhance overall supply chain responsiveness. Integrating advanced technologies such as the Internet of Things (IoT), artificial intelligence, and blockchain fosters transparency and collaboration across the supply network, contributing to a resilient and adaptive business ecosystem.

1.1.3 Food and Beverage Manufacturing Firms in Nairobi County

The classification of food and beverage processing firms within Nairobi County falls under the broader spectrum of the manufacturing industry, as explained by (Magutu, Aduda, & Nyaoga, 2015). The food and beverage processing segment are relatively well-developed sector with products ranging from dairy products, canned vegetables, bakery products, sugar and confectionary, fish, oil, and fats among many other products (Muthoni & Mose, 2020). Beverage and food processing businesses in Kenya range from small or family-owned informal firms to large formal enterprises listed in the Nairobi Stock Exchange (NSE).

Multinational food and beverage processing firms have operated in Kenya either as foreign or as joint ventures (KPMG East Africa, 2020). Food and beverage firms contribute to more than 20% of the membership of the KAM (KAM 2023). Therefore, the food and beverage processing sector play a big role in driving economic growth, and expansion in this industry can have a profound effect on Kenya's economy as an entirety (Gichuru, Iravo, & Arani, 2015; Nthenge, 2019). The research aimed at 104 Food and beverage manufacturing organizations in Nairobi County (KAM, 2023).

According to Deloitte (2021), the food and beverage industry has experienced a substantial decline in consumption due to the effects of Covid-19, leading to an impact on household spending capacity. This has seen some firms closing down or reducing the level of their operations. Further, increased supply chain disruptions are forcing companies to limit their production capacity which limits their overall performance. This dismal performance is consistent with UNIDO- United Nations Industrial Development Organization (2021) which reported that the Kenya manufacturing industry has generally contracted 3.9 percent and 3.2 percent in the second and third quarters of 2020, correspondingly. Similarly, KAM (2021) highlights that the industries that saw the greatest decline in customer demand were the food & beverage and automotive sectors. Low demand in the hotel sector is to blame for the reduction. Which consumes the products of food and beverage industry.

1.2 Research Problem

The Covid-19 pandemic severely dented the world economy by resulting in negative supply movements which led to most manufacturing entities closing down or disrupting their supply chains (Roy, 2020). Klitkou and Bolwig (2019) noted that of the many fast-growing industries, the food and beverage industry accounted for over 80% of the overall employment in Europe. However, with the onset of Covid-19, the industry faced a drastic drop in its growth projections. Further, the pandemic resulted in most firms facing a downturn in their growth prospects and a decrease in business operations (Hosain & Rasel, 2020). Hobbs (2020) indicated that increased lockdowns due to the Covid-19 outbreak resulted in poor resilience among food and beverage supply chains due to the changes in the consumption patterns and poor supply chain. However, there has been limited empirical examination of the influence of Covid-19 disruption to supply chain and business resilience of food and beverage businesses in Nairobi County.

Locally, with the lockdowns, closure of hotels, restaurants and bars, the industry lost its largest consumers. Further, restriction of movement and continuous closure of alcohol and beverage outlets led to a breakdown in operations for several local plants (KPMG East Africa, 2020). Further, the KPMG report commissioned by the Kenya Association of Manufacturers, found out that there was 55% drop-in hours worked, 3% reduction in sales volume, 25% reduction in workforce, and 44% reduction in demand within the manufacturing sector. Muthoni and Moses (2020) established that supply chain management (SCM) (production management, supplier planning, and supplier collaboration) were vital to the improvement of food and beverage manufacturing companies located in Kenya. Mutuku and Moronge (2020) reviewed reverse logistics and concluded that product returns management, disposal management, product repackaging, and recycling management were key predictors of how Food and Beverage Manufacturing businesses perform in Nairobi County. Muricho and Muli (2021) noted that there was weak performance in the food and beverage industry that can be ascribed to rising operational fee and wastages in the whole supply chain; hence the need to explore if covid 19 induced disruptions in supply chain has affected the firms. However, there is limited empirical evidence examining covid-19 disruptions to supply chain and how food and beverage industry related companies in Kenya perform. The above studies have identified various conceptual gaps that would be addressed by the current research.

Deaton and Deaton (2020) averred that Covid-19 supply disruption had resulted in a negative influence on food security in Canada. In their study in Nigeria, Adeleke, Daniel, and Ojeleke (2020) called for firms to deploy appropriate disruption management strategies which can help beverage firms improve their performance during distress in their supply chain. Mun Yuko (2015) in a study of Andy Forwarders in Kenya established a positive association connecting supply chain risk management to organizational performance. Mohamed and Omwenga (2015) found out that effective supply chain risk mitigation strategies positively

improved the performance of Coca-Cola manufacturers in Kenya. Muricho and Muli (2021) revealed that supply chain collaboration and integration have been vital to managing supply chain disruptions affecting alcoholic manufacturing companies in Kenya. The preceding studies did not thoroughly investigate the Covid-19 supply chain disruptions in Kenya. This research aimed to fill this empirical gap by endeavouring to respond to the study question: What was the impact of Covid-19-induced supply chain disruptions on the business resilience of beverage and food manufacturing firms in Nairobi County?

1.3 Research Objectives

The major goal of the research was to determine the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya.

The specific aims of the research were;

i. To establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya
ii. To find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya

1.4 Value of the Research

These research findings will inform policy formulation by providing policymakers with crucial insights on adapting supply chain strategies during the ongoing Covid-19 pandemic, ultimately enhancing the performance of the food and beverage industry. Therefore, they will formulate policies that will define how firms can reinvent their supply chain practices and strategically respond to the changes brought by Covid-19 to the firms.

The research findings carry significant implications for firms operating in the food and beverage industry, providing valuable support for improved decision-making in the strategic

alignment of their supply chains. As businesses navigate the complexities of the contemporary landscape, the insights garnered from this study offer actionable information to enhance the efficiency and business resilience of supply chain management. By incorporating these findings into their decision-making processes, companies in the food and beverage sector can adapt and optimize their supply chain strategies, ensuring greater adaptability and responsiveness in the face of dynamic challenges, such as those posed by the ongoing Covid pandemic.

The outcomes of this research will contribute substantially to the existing body of knowledge regarding the impact of the Covid-19 pandemic on the business resilience of firms in Kenya. By shedding light on these effects, the study adds valuable information that is essential for fortifying the empirical evidence base. This newly acquired knowledge not only enhances our understanding of the specific challenges faced by businesses in Kenya during the pandemic but also lays a foundation for future research endeavours examining global pandemic-related supply chain disruptions. The insights gained from this study can serve as a reference point for researchers, policymakers, and industry stakeholders seeking to explore and address the broader implications of such disruptions on business resilience and continuity.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter explores into the literature pertinent to the research. It initiates with a discussion of relevant theories, followed by an exploration of various Covid-19 induced supply chain disruptions. Subsequently, an empirical literature review is presented, summarizing the literature and highlighting gaps in the study. The chapter concludes with the presentation of the conceptual framework.

2.2 Theoretical Foundation

This section deliberates on the relevant theories to this research. Two theories guide the study: the dynamic capabilities and systems theory. The main theory is the dynamic capabilities theory because it allows 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 and Pisano (1994).

2.2.1 Dynamic Capabilities Theory

Dynamic capability defined as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (by Teece, Pisano, and Shuen (2012), capabilities are intricate collections of skills and group learning that are used in organizational processes to provide the best possible coordination of functional tasks and are ingrained deeply into the structure of the organization.

According to Wilden, Gudergan, Nielsen, and Lings (2013) and Helfat and Peteraf (2015), attaining the anticipated performance of the company at the organizational level is an indication of the company's abilities and capacity to integrate both the tangible and intangible resources so as to attain the objectives. As a result, businesses that are better able to adapt to

changing circumstances and market demands will be more successful over the long term. The top management team's viewpoint that steady progression is crucial to developing dynamic skills is acknowledged by the dynamic capabilities view as averred by Teece, Pisano, and Shuen (2012). In the current study the capabilities of the firm are vital to the response of the firm to the disruptions that were brought about by the pandemic. These capabilities allow the firm to strategically respond to the challenges by leveraging on their developing digitalized supply chains, adopting logistics outsourcing and supplier collaborations engagements which can enhance business resilience. One of the criticisms of the dynamic capabilities concept is that they are difficult to measure empirically, as are the underlying operational processes as well as the relationship between dynamic capabilities and firm performance as cited by Roy, S. (2020).

2.2.2 Systems Theory

Systems theory is credited to Bertalanffy (1968) and it emerged from the field of biology to explain the interconnectedness between organisms. It was expounded in later years by Weinberg (1975), Miller (1978) Yourdon (1989), and (Rudolf, 2011) into the management field. According to Bertalanffy (1968), for an organization to succeed, it needs to develop synergy, interdependence, and interrelations between various subsystems which are all interconnected and work to produce a desired result. It is theorized that an organization is a collection of subsystems that work together to address specific needs and produce a desired result. Failure in one of the systems would result in an overall loss of quality of the end product. This theory calls for a holistic view of a system when identifying challenges as opposed to isolating the system into various subparts.

According to the systems theory, the supply chain is a subsystem that facilitates transfer of essential materials and services for production of goods and services to the final consumer.

The supply chain is composed of sourcing and procurement systems, information systems management, logistics systems, and the integration of these systems through competent relationship management to gain competitive advantage. The systems theory underscores the significance of technology integration to enhance flexibility and innovation, ensuring business continuity. Additionally, it emphasizes the benefits of logistics outsourcing for cost reduction and liability management, as well as the importance of supplier collaboration, leading to increased competitive advantage, which, when sustained, contributes to long-term resilience.

2.3 Covid-19 Induced Supply Chain Disruptions

There is no doubt that Covid-19 impacted supply systems worldwide and that the epidemic put many supply chain leaders' ability to sustain critical operations to the challenge. The main operational areas impacted were; upstream, internal and downstream operations as reported by Mc Kinsey (2021). Each of these components of the supply chain is expounded in subsequent paragraphs.

The supply chain upstream focuses on operations carried out on the buy-side of the business, mostly by its suppliers and bypassing any intermediaries already in place. The primary tasks associated with this supply chain design, according to Mc Kinsey (2021), are the acquisition of raw materials from suppliers and inbound logistics. The closure of factories and an economic slowdown caused a decline in production because of Covid-19 on upstream supply chain management. This, in turn, disrupted businesses' backward-integrated activities in acquiring inventories (Sucharitha & Basha, 2022). The company’s interactions with its suppliers are a crucial factor in the upstream supply chain. Building strong connections with the major suppliers is essential, according to (McIvor, 2000), which may be done by including them in product development or design, working with them to adopt integrated business processes, and exchanging helpful information.

The internal operations is the utilization of firm's assets and employees to meet the organization's objectives (Almashhadani & Almashhadani, 2022). An organisation that has knowledge on how to utilize internal resources efficiently will realize positive operational performance as averred by Darroch (2005).

The sell-side of the supply chain, which consists of distributors and prospects, is included in the downstream supply chain practices. Outbound logistics and fulfilment have been identified by Chaffey (2011) as the main components of this model. The downstream supply chain is also affected by sales and customer relationship management difficulties. During the Covid-19, downstream SCM is where the intermediaries or middlemen faced numerous difficulties due to scarcity of inventory as well as the introduction of various quarantine measures taken by many countries (Sucharitha & Basha, 2022).

There were several interruptions in the downstream, internal and upstream supply chains, which caused a serious inventory shortage that affected all of the economies internationally. Due to this circumstance, many economies are considering how global nations' supply chains are interconnected and dependent on one another (Zeng & Yen, 2017; Sucharitha & Basha, 2022), prompting a re-evaluation of strategies and collaborations in the pursuit of enhanced resilience and sustainability.

2.4 Empirical Literature Review

The section reviews the existing literature on supply chain disruptions and business resilience. Ndemezo, Ndikubwimana and Dukunde (2018) did research on the effect of financial incentives on capacity utilization of beverage and food companies in Rwanda. Ordinary least squares (OLS) methodology was applied on data sourced from an augmented Cobb Douglass production function. Capacity underutilization was exacerbated by insufficient supply of raw materials, poor technologies' adoption, and poor enforcement of tax administration and standards. Utilization was determined by the firm's age and

characteristics of the raw material. The study recommended implementing non-tax incentives. These incentives aim to enable young manufacturers to harness emerging technologies, thereby expanding their access and inclusion in regional markets. Additionally, the study suggests forming strategic alliances with long-distance suppliers to ensure consistent access to materials throughout the year. The study's limitations include its industry-specific focus on beverage and food companies in Rwanda, potential methodological oversights in relying on Ordinary Least Squares (OLS), and the need for further exploration of the intricate interactions among identified factors, as well as a more in-depth examination of the practical feasibility and challenges associated with the recommended strategies.

Shou, Prester and Li (2018) investigated the connection between intellectual capital, supply chain collaboration (SCC) and business performance. The research, which surveyed 1008 manufacturers used structural equation modelling in its analysis of how having a common shared vision and interlinked communications' system enhances long term sustainability. The analysis revealed a strong positive link between the variables. The study reported that it is necessary to explore relationship management strategies to first enhance supplier collaboration before adopting shared intellectual capital and communication channels for better performance at at the sector-wide level. A limitation of the study is its focus on a singular sector (manufacturing) and the need for further investigation into relationship management strategies that specifically enhance supplier collaboration before adopting shared intellectual capital and communication channels for improved sector-wide performance.

Arusei and Musau (2020) study focused on how collaboration with suppliers affects performance of county government's procurement in Elgeyo Marakwet County. A descriptive research design was used targeting ICT staff, quality assurance staff, suppliers, store staff, finance managers and procurement staff. Census methodology was employed. The

analysis showed that supplier collaboration facilitates relationship building between suppliers and buyers, improves sharing of resources through partnerships and joint investment. More so it reduces cost of acquiring market information, enhances transparency and reliability of the supply chain, thereby adding significant value to the organization. A limitation of the study is its exclusive focus on Elgeyo Marakwet County, limiting the generalizability of findings to other regions or contexts. Additionally, the research employed a census methodology, potentially overlooking variations within the sampled groups, and it primarily targeted specific roles within the county government, possibly missing perspectives from other relevant stakeholders that could provide a more comprehensive understanding of supplier collaboration's impact on procurement performance.

Quayson, Bai and Osei (2020) carried out a literature review to identify lessons from developed countries on business sustainability with the aim of proposing a framework for coming up with resilient and sustainable post Covid-19 supply chains for nations that are developing. This study specifically sought to determine how small-scale farmers can be included in the digital marketplace. The review showed that digital technologies increased farmer inclusion through facilitation of digital payments. The technologies also increased connectivity between farmers and buyers, and exposes farmers to higher quality information through use of big data. The study also showed the potential of combining emerging farming technologies and internet of things to increase production and transform farming. Through facilitation of digital farming, the study determined that blockchain technologies could improve supply chain effectiveness and reduce vulnerability of companies in the food processing sector to unexpected shocks and changes in demand and availability of farm produce. A limitation of the study is its reliance on a literature review, potentially limiting depth compared to empirical research, and the focus on lessons from developed countries may not fully address the unique challenges of developing nations.

Marusak, Sadeghiamirshahidi, Krejci, Mittal, Beckwith, Cantu, and Grimm (2021) study focused on seven regional FSCs in Texas and Iowa. It asserts that in the United States, the food supply system is heavily reliant on vertical integration of food supply chains (FSCs). These firms leverage on production in large-scale, operations that are streamlined, and centralized planning and control which ensure smooth service provision and access of foodstuff to enable consumers get supply of food consistently. These firms had been successful in integrating emerging logistics practices to improve customers' purchasing options. The study reported that the firms' collaboration, adoption of large-scale information distribution systems, and logistics outsourcing reduced transportation-related risks and costs. A limitation of the study is its narrow geographic focus on Texas and Iowa, potentially limiting the generalizability of findings to a broader national context. The assertion about the heavy reliance on vertical integration in the U.S. food supply system may not fully capture the diversity of supply chain structures and practices across the entire nation. Additionally, the study emphasizes successful integration of emerging logistics practices, but it may not thoroughly explore potential challenges or drawbacks associated with these practices in different regional contexts.

Budler, Jakšič and Vilfan (2021) carried out a longitudinal study which sourced survey data from large Slovenian manufacturing, food processing, and fabricated metal products subsector. The research displayed a significant increase in adoption of logistics outsourcing by various firms. Companies have opted to outsource warehousing, transportation, and financial management, resulting in lowered operational costs and improved access to high-quality information. The reports indicate a noticeable enhancement in resilience and long-term sustainability. A limitation of the study is its sector-specific focus on Slovenian manufacturing, potentially restricting broader applicability, and the longitudinal design may not capture recent trends or potential drawbacks of logistics outsourcing.

Shou, Zhao, Dai and Xu (2021) carried out a literature review on the effect of operational innovation on manufacturing firms around the world. The study determined that operational innovation measured by matching of traceability and internet-based supply chain coordination (SCC) increases a firms' superiority. The study recommended increased investment in digitization tools to facilitate operational innovation in the supply chain to overcome the current cross-boundary challenges experienced in the foods sector which provides raw materials for many of the industries. The study is limited by its dependence on a literature review, potentially limiting depth compared to empirical research. Additionally, the global focus may overlook industry-specific nuances, and while the study recommends increased investment in digitization tools for operational innovation, it may not thoroughly explore potential challenges or barriers associated with this recommendation.

In Thailand, Ketudat and Jeenanunta (2021) sought after the resilience drivers promoting success in the country's Logistics industries during the Covid-19 pandemic. The study involved three top-ranked managers from three firms and collected data through structured questionnaires and interview guides. Thematic analysis was then applied. Practices to do with enhanced business flexibility, established and well communicated continuity plan, diversification of products and services, integration of IT systems and especially the leadership type were key to determining the firms' stability during the pandemic. Internet technologies were reported to play a critical role in promoting continuous business operation while the continuity plans were essential in protecting the business in the long-term. The study is limited by its small sample size of three top-ranked managers from three firms, potentially impacting the broader applicability of findings in Thailand's Logistic industries. Additionally, while identifying key resilience drivers, the study may not thoroughly explore challenges faced by firms in implementing these practices during the Covid-19 pandemic.

In a descriptive study, Njuguna, Arani and Onyara (2021) focused on supply chain in the pharmaceuticals sector. The research targeted 30 medical supply entities. The firms' procurement department was inadequate in addressing organizational challenges. The study determined that performance and sustainability could be enhanced through warehousing, information integration, lean supply chain management and outsourcing. However, outsourcing and warehousing were identified as the most significant drivers of firms' resilience. A limitation of the descriptive study is its narrow focus on 30 medical supply entities, potentially limiting the generalizability of findings to the broader pharmaceutical sector. While the study identifies factors for enhancing performance and sustainability, it may not thoroughly explore potential obstacles or challenges faced by organizations in implementing these measures in their procurement departments.

Mwangi, Ragui, and Arani (2021) conducted a Kenyan study on supplier collaboration in retail stores, utilizing a cross-sectional descriptive survey with a sample of 160 staff members. Correlation analysis was used, and the results showed that supplier collaboration considerably boosts retail outlets' success by encouraging the development of collaborative market entrance strategies, improving outsourced relationships, and raising supplier contract performance. This was achieved through enhanced shared production engineering, improved monitoring of supplier performance, and the development of long-term strategic alliances. As a result, resilience was improved through reduced supply, improved inventory management, better cargo tracking, reduction in defective products, and streamlined response to buyer queries through enhanced communication. The study by Mwangi, Ragui, and Arani (2021) is limited by its use of a cross-sectional descriptive survey design, potentially not capturing the dynamic nature of supplier collaboration impacts over time. Additionally, the focus on 160 staff members may not fully represent diverse perspectives within retail outlets, and the

positive outcomes identified may not thoroughly explore potential challenges or variations across different retail contexts.

In a study by Mulyadi and Hendrayati (2021), the impact of the ongoing Covid-19 pandemic on SMEs was examined, with organizations striving to survive and avoid layoffs. To identify strategies for pandemic resilience in SMEs, considered vital to the Indonesian economy, the research employed quantitative methods on 299 SMEs in North Sumatra. The analysis, conducted using the Structural Equation Model and SmartPLS version 3, provided insights into the resilience of SMEs in Northern Sumatra and the relationships among organizational pro-social behaviour, flexibility, and collaborative abilities. However, the study's limitation lies in its focus on a specific region, potentially limiting the applicability of findings beyond the sampled SMEs in North Sumatra.

According to a review of the literature on inflation and COVID-19 supply chain disruptions by Chakraborty (2023), the unsettling state of the world economy was brought on by the COVID-19 pandemic's unanticipated hazard. This included rising inflation and its trajectory over the disruption of supply chain management, which in turn encouraged all manner of novel disruptions to maintain market equilibrium. Across various business domains, encompassing recreation, healthcare, services, education, and notably, the retail industry, the study identified an anomaly associated with the surge in stochastic employment and the subsequent reinforcement of online or digitized dependence (Chakraborty, 2023). Limitation in the study is the broad focus, potentially overlooking sector-specific nuances and the comprehensive exploration of challenges associated with these trends.

2.5 Summary of Empirical Literature and research Gaps

Table 2.1 below, summarizes the empirical literature reviewed in the study. It shows the Author(s), focus of the research, the methodology, key outcomes, study gaps and how these were addressed in the current research.

Table 2.1 Summary of Empirical literature review and knowledge gaps

Author(s)	Research Aim	Methodology	Key Findings	Knowledge Gaps	Addressing Gaps
Ndemezo, Ndikubwimana and Dukunde (2018)	Effect of financial incentives on utilizing capacity of beverage and food organizations in Rwanda.	The research used ordinary least squares (OLS) methodology Data sourced from one firm	Utilization was determined by the firm's age and characteristics of the raw material.	The study concentrated on utilizing capacity of beverage and food companies in Rwanda and not supply chain disruptions in firms in Kenya	The study will focus on covid 19 induced disruption of supply chain in food and beverage companies in Kenya
Shou, Prester and Li (2018)	The rrelationship between intellectual capital, supply chain collaboration (SCC) and business performance	The study Surveyed 1008 manufacturers and used structural equation modelling	The study reported it is necessary to explore relationship management strategies to first enhance supplier collaboration.	The study looked at business performance in manufacturing firms and not Business resilience in food and beverage companies in Kenya	The study will focus on covid 19 induced supply chain disruptions and impact on business resilience in beverage and food businesses in Kenya
Arusei and Musau (2020)	How collaboration with suppliers affect county government's procurement performance in Elgeyo Marakwet	The study used Census methodology and a descriptive research design targeting ICT staff, quality assurance staff, suppliers, store staff, finance managers and procurement staff	Supplier collaboration facilitates relationship building between suppliers and buyers, improves sharing of resources through partnerships	The research did not review how various Covid-19 induced disruptions impact business resilience and was limited to firms in Elgeyo Marakwet county	The study be on covid 19 induced supply chain disruptions and focus will be on food and beverage firms in Kenya
Quayson, Bai and Osei (2020)	Digital inclusion for resilient post-COVID-19 supply chains: smallholder	literature review to identify lessons from developed countries on business sustainability	The review showed that digital technologies increased farmer inclusion through facilitation of	The emphasis of the research was on smallholder firms	The current study will be on business resilience of food and beverage firms

Author(s)	Research Aim	Methodology	Key Findings	Knowledge Gaps	Addressing Gaps
	farmer viewpoints		digital payments.		in Kenya.
Marusak, et.al. (2021)	Resilient regional food supply chains and rethinking the way forward: Key takeaways from the COVID-19 pandemic	The study focused on seven (7) regional FSCs in Texas and Iowa.	The study reported that the firms' collaboration, adoption of large-scale information distribution systems, and logistics outsourcing reduced transportation-related risks and costs	The study did not consider how disruptions in supply chains has impacted business resilience and focused on FSCs in USA	The study will focus on covid 19 induced supply chain disruptions in food and beverage firms within the Kenyan context
Budler, Jakšič and Vilfan (2021)	Logistics Outsourcing in Large Manufacturing Companies	The study sourced survey data from large Slovenian manufacturing, food processing, and fabricated metal products subsector	The study found out that the Firms that outsource warehousing, transport and financial management has reduced operating cost and increased access to quality information, and in turn an increase in resilience and long-term sustainability.	The study did not consider how disruptions in the upstream and downstream could enhance resilience among firms.	The study will include upstream and downstream activities for beverage firms in Kenya
Shou, Zhao, Dai and Xu (2021)	Effect of operational innovation on manufacturing firms around the world	The study carried out a literature review	The study recommended increased investment in digitization tools to facilitate operational innovation in the supply chain to overcome the current challenges experienced in the foods sector	The study did not consider how upstream and downstream activities could enhance resilience among firms.	The study will include supply chain activities in food and beverage organizations in Nairobi County
Ketudat and Jeenanunta (2021)	The resilience drivers promoting success in the country's	The study involved three top-ranked managers from three	Practices having to do with enhanced business flexibility, established and	The study was in Thailand and did not investigate the	The study will focus on covid-19 induced supply chain

Author(s)	Research Aim	Methodology	Key Findings	Knowledge Gaps	Addressing Gaps
	Logistic industries during the Covid-19 pandemic	firms and collected data through structured questionnaires and interview guides	well communicated continuity plan, diversification of products and services, integration of IT systems were key in determining the firms' stability during the pandemic	relationship between the supply disruptions to business resilience	disruptions in food and beverage businesses in Nairobi County
Njuguna, Arani and Onyara (2021)	Supply chain in the pharmaceuticals industry	Descriptive study targeted 30 medical supply entities	The study found out that outsourcing and warehousing were most significant drivers of firms' resilience.	The study did not consider how Covid-19 induced supply chain disruptions could enhance resilience among firms.	The study will include upstream and downstream activities as an independent variable in business resilience
Mwangi, Ragui and Arani (2021)	How supplier collaboration impacts retail stores performance	The research implemented a cross-sectional descriptive survey study design which involved 160 staff members	The study key finding was that supplier collaboration significantly improves retail stores performance and as a result resilience was improved	The study concentrated on retail stores and not food and beverage companies	The study will focus on business resilience in food and beverage firms in Kenya
Sahil et al (2022)	How the COVID 19 has led SMEs experience ongoing predicament.	This research involved 299 SMEs situated in North Sumatra using qualitative and quantitative methodologies	The study showed a comprehensive diagnosis of the resilience of SME and also the link among business flexibility	The study focused on SMEs in Indonesia and the measure for business resilience used was business flexibility	The study will focus on manufactures and review additional business resilience metrics; speed and cost
Chakraborty (2023)	A study on inflation and covid 19 disruption	The study 19 valuable contributions from eminent authors from	The study determined that the troubling state in the world-wide economy was	The study focused on multinationals in turkey and the book	The study will include upstream and downstream

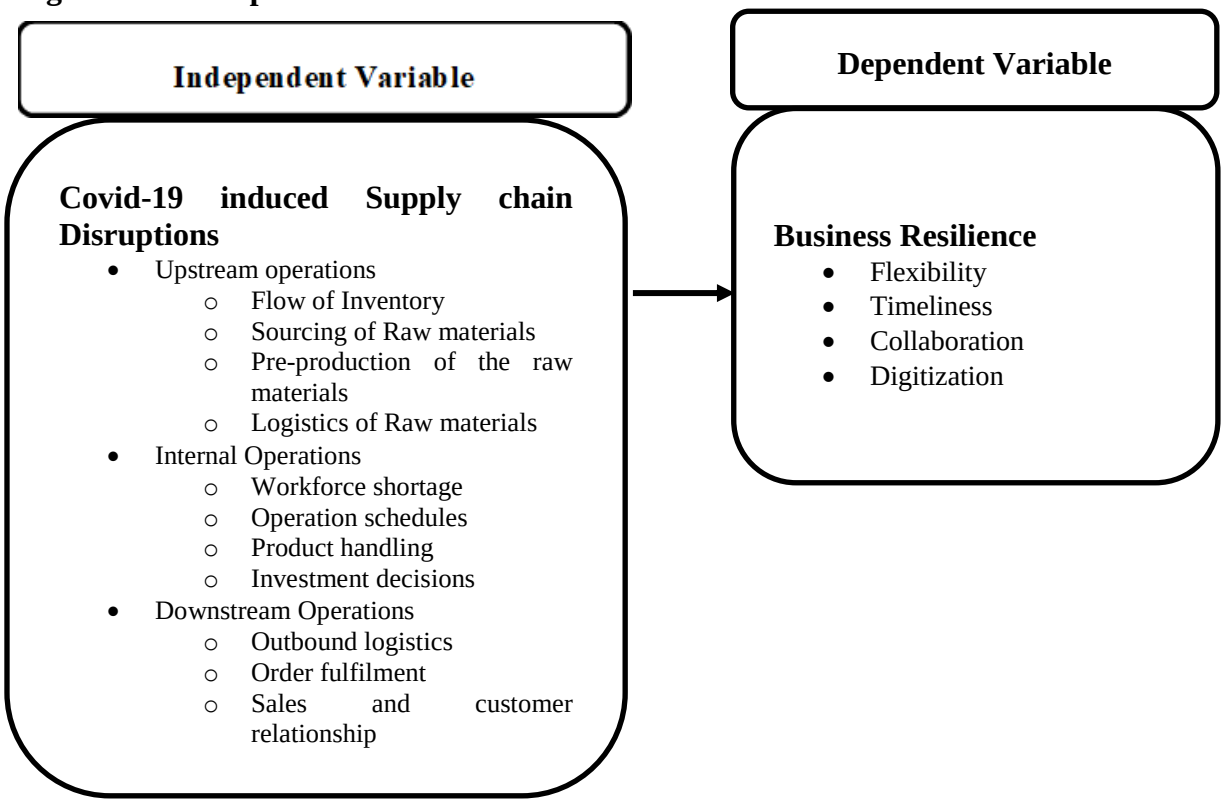
Author(s)	Research Aim	Methodology	Key Findings	Knowledge Gaps	Addressing Gaps
		different countries. The countries include Turkey, India, Israel, Jordan, Mexico, Saudi Arabia, and Republic of Serbia	caused by the unanticipated threat from the COVID-19	explores the pandemic-causing economic bottlenecks.	activities for beverage firms in Kenya

Source; Researcher (2023)

2.6 Conceptual Framework

The independent variable in this research is, covid 19 induced supply chain disruptions and it has three dimensions which are upstream, internal and downstream operations. The dependent variable is business resilience, which is measured using operational performance indices of flexibility, timeliness, collaboration and digitization. These are systematically depicted in figure 2.1below.

Figure 2.1 Conceptual Model



Source; Researcher (2023)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The research approach that was used in the study is provided in this chapter. The discussion of the research strategy is followed by a description of the target population and then the data gathering techniques. A discussion of data analysis methods concludes the chapter.

3.2 Research Design

Descriptive research was employed in the present research. This study design provides the basis for the study since it supports the examination of a phenomena within its present environment (Cooper & Schindler, 2006). Further, the design was key to exploring the interaction of the research variables by means of quantitative approach such as inferential and descriptive tests.

3.3 Target Population

The population of the research are the registered food and beverage firms in Nairobi County. According to Kenya Manufacturers & Exporters Directory (2023) they are 104 in number (Appendix II). Since this population is not too large and in order to improve the response rate, a census was carried out.

3.4 Data Collection

The research utilized primary data which was collected by means of a questionnaire that was structured with Likert scale statements. The questionnaire had 3 sections. Section A, captured general data about the firm and the respondents; section B, addressed covid-19 induced supply chain disruptions which comprised upstream operations, internal operations and downstream operations while section C, captured data for business resilience (flexibility, timeliness, collaboration and digitization). A single respondent (the supply chain manager or the equivalent) was targeted for each organization. This is deemed to be the individual with the requisite information to attain the objectives of the study. The study adopted Google

forms in the data collection, and this was complemented by physical questionnaires in order to enhance the response rate.

3.5 Data Analysis

The data analysis was dependent on the particular objective in the study. For general information and objective one (To establish the extent of Covid 19 induced supply chain disruption, in food and beverage manufacturing firms in Nairobi County) descriptive statistics was applied. To attain objective two (to find out the impact of covid 19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, regression and correlation analyses were applied. Tables were used to display the research results after analysis.

The regression model that was applied is;

$Y = \alpha+\beta_1X_1+ \beta_2X_2+\beta_3X_3+€$

Where: Y = Dependent Variable (Business Resilience and it is a composite measure of flexibility, timeliness. collaboration and digitization)

X=Independent variables, which are: X_1= Upstream Operations; X_2= Internal Operations and X_3=Downstream Operations α = the constant; β_{1-3} = the regression coefficients ϵ = error term.

Table 3.1: Summary of Data Collection and Analysis Methods

Objectives	**Section of the Questionnaire**	**Response of the data analysis**
Firm and respondent data	Section A	Descriptive statistics
To establish the degree of Covid 19 induced supply chain disruptions in food and beverage manufacturing businesses in Nairobi County	Section B	Descriptive Statistics
To determine the impact of covid 19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County	Section C	Correlation and Regression analysis

Source: Researcher (2023)

CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

The chapter presents analysis of data and interpretation, then discusses the results. The section elaborates on the objectives which are Objective 1 to establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya

and objective 2 to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, using descriptive statistics and regression analysis. Further the chapter presented the discussion of the study findings in line with empirical literature reviewed.

4.2 Response Rate

The study targeted food and beverage manufacturing firms in Nairobi to find out the influence of Covid-19 induced supply chain disruptions on their resilience. A census was conducted, and 104 questionnaires were distributed, one to each firm that fell in the targeted category. 67 questionnaires were fully filled and retuned. (Mugenda & Mugenda, 2003) argues that a response rate of 60% is adequate for data analysis, which was the case in this study.

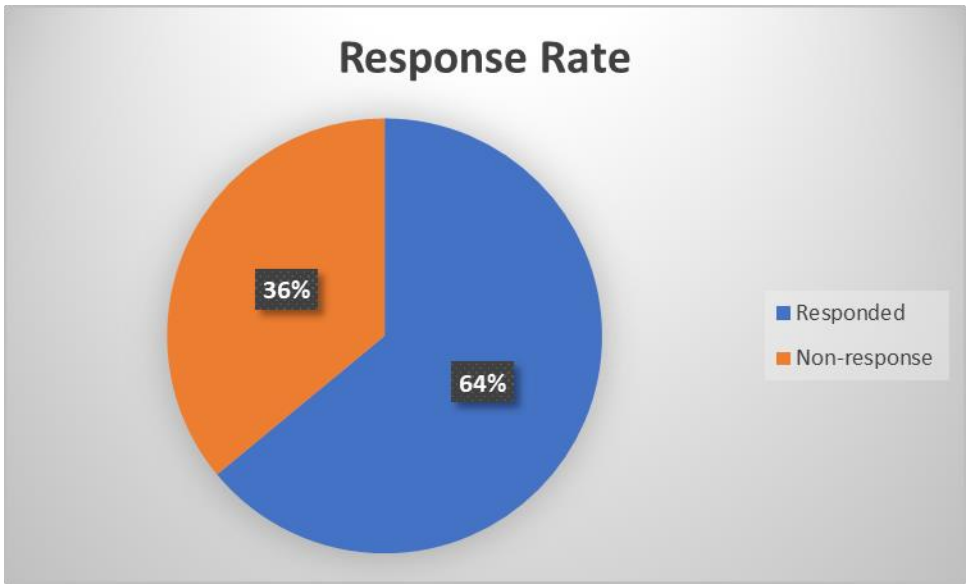


Figure 4.1 Response Rate

Source: Research Data (2023)

4.2.1 Background Information

The survey was interested in the demographic profile of the participants involved and the summary of the results is presented in this section.

4.2.1.1 Gender of Respondents

The analysis of the gender of the participants of the study is presented in the Table 4.1 below;

Table 4.1 Gender of Respondents

		Frequency	Percent
	Male	38	56.7
	Female	26	38.8
	Prefer not to say	3	4.5
Total		**67**	**100.0**

Source: Research Data (2023)

Based on the analysis the majority of participants were male, comprising 57%, followed by females at 39%. The remaining 4% either preferred not to disclose or fell into other

categories. The demographic distribution of participants by gender is crucial for understanding the composition of the study sample. This information allows for considerations related to potential gender-related variations in responses, which may impact the generalizability and interpretation of study findings.

4.2.1.2 Position in the Firm

The participants were asked to state the position that they occupy in the company and the results are displayed in Table 4.2.

Table 4.2 Position held in the Firm

Position	Count	Percentage
Middle Level Manager	44	66%
Senior Manager	10	15%
Quality assurance assistant	1	1%
Supervisor	1	1%
Lab assistant	1	1%
Executive Management	2	3%
Not mentioned	8	12%
Total	**67**	**100%**

Source: Research Data (2023)

The results indicate that the majority of participants held middle-level managerial positions, constituting 66%, while senior managers accounted for 15%. In total, this represents 81% of participants occupying higher positions within the organization. Those that were in other positions in the firm who participated had a proportion of 19% including those who didn't mention their position in the questionnaire. Therefore, it is implied that the questionnaires were filled by those who have knowledge about the organization's operations.

4.2.1.3 Length of time Firm has been in Operation.

The participants were requested to show the period the company has existed, and the results are summarized in Table 4.3.

Table 4.3 Length of time Firm has been in Operation.

		Frequency	Percent
	Not more than 3	18	26.9
	4 to 6	13	19.4
	7 to 10	15	22.4
	More than 11	21	31.3
	Total	**67**	**100.0**

Source: Research Data (2023)

According to the findings, 27% of the firms have been operational for less than 3 years, 19% have a tenure between 4 and 6 years, 22% have been in existence for 7 to 10 years, and 31% have a history of more than 11 years. The significance of this information to the study lies in providing a comprehensive understanding of the distribution of firms across different durations of existence. This data allows for insights into potential variations in business strategies, challenges, and success factors based on the length of a company's existence, which can contribute to a more nuanced analysis of the study's objectives.

4.3 Descriptive Analysis

The research relied on Likert scale statements to collect survey data on the variables of the study. The summary of responses obtained was analyzed using means, standard deviation and sum of the variable and are presented based on the conceptualization adopted in the research.

4.3.1 Upstream Operations in Manufacturing Firms

The first predictor variable considered how various upstream operations were conducted in the manufacturing firms and analysis is presented in Table 4.4 below.

Table 4.4 Descriptive Analysis of Upstream Operations

	N	Sum	Mean	Std. Deviation
The cost of raw materials increased during the pandemic	67	270.00	4.0299	.93695
All face-to-face meetings with suppliers were cancelled during the pandemic resulting to delays in resolving issues	67	270.00	4.0299	.99955
The cost of freight for imported materials increased during the pandemic	67	261.00	3.8955	.95559
Covid 19 impacted the capacity of our suppliers to produce orders for raw materials	67	256.00	3.8209	.91990
Covid 19 negatively affected our lead times for imported raw material	67	253.00	3.7761	.91818
The pandemic had substantial negative effects on the firms supply chain	67	251.00	3.7463	1.11930
Average score			**3.8831**	**0.9749**

Source: Research Data (2023)

The results revealed that to a high degree (mean = 4.029, dev = .936) the respondents noted that cost of raw materials increased during the pandemic for manufacturing firms. Further, to

a high degree (mean = 4.029, dev = .999) participants indicated that face to face meetings were cancelled impacting issue resolution. The survey findings showed to a high degree Covid 19 impacted the capacity of our suppliers to produce orders for raw materials (mean = 3.820, dev = .919).

4.3.2 Internal Operations in Manufacturing Firms

The second research variable was interested in reviewing the internal operations within the manufacturing firms and findings are shown in Table 4.5 below.

Table 4.5 Descriptive Analysis of Internal Operations

	N	Sum	Mean	Std. Deviation
The coordination with marketing team is successful	63	226.00	3.5873	1.11637
There is a visibility of processes inside the company	65	233.00	3.5846	1.28565
Alignment of systems across all functional units have been achieved	66	236.00	3.5758	1.13762
Cross functional management is widely utilised	66	235.00	3.5606	1.19136
Sharing of information inside the firm is extensive	66	233.00	3.5303	1.07015
Periodic interdepartmental meetings are commonly utilised	66	229.00	3.4697	1.30348
There is awareness of strategic plans to the appropriate parties within the firm	66	228.00	3.4545	1.20489
Average	**58**		**3.5375**	**1.18707**

Source: Research Data (2023)

The findings demonstrated that to a high degree (mean = 3.5846, dev = 1.285) there is a visibility of processes inside the company. Respondents also noted to a high degree the firms aligned systems across all functional units have been achieved (mean = 3.575, dev = 1.137). The research noted that to an average degree there are common periodic interdepartmental meetings within the firm (mean = 3.469, dev = 1.303). The results revealed to an average degree there was awareness of strategic plans to the appropriate parties within the firm (mean = 3.454, dev = 1.204).

4.3.3 Downstream Operations in Manufacturing Firms

The third variable considered how downstream operations are conducted in the manufacturing firms and the summary of responses is presented in Table 4.6

Table 4.6 Descriptive Analysis of Downstream Operations

	N	Sum	Mean	Std. Deviation
The product delivery to customers was impacted as government restriction forced restricted access to some outlets	67	271.00	4.0448	.96032
The sales of the organisation were negatively impacted during the pandemic	67	270.00	4.0299	1.07267
All face-to-face meetings with customers were cancelled during the pandemic resulting to reduced turnover	67	267.00	3.9851	.97689
Government restrictions, negatively impacted on our ability to reach customers	67	264.00	3.9403	1.04273
Transportation to access our customers to deliver products was disrupted	67	261.00	3.8955	1.01704
The distribution channels were negatively impacted hence compromising customer engagements	67	259.00	3.8657	1.07161
Average	**67**		**3.9602**	**1.0235**

Source: Research Data (2023)

Respondents indicated to a high degree the product delivery to customers was impacted as government restriction forced restricted access to some outlets (mean = 4.044, dev = .960). The results further revealed to a high degree all face-to-face meetings with customers were cancelled during the pandemic resulting to reduced turnover (mean = 3.985, dev = .976). A mean of 3.865 showed that to a high degree the distribution channels were negatively impacted hence compromising customer engagements.

4.3.4 Business Resilience in Manufacturing Firms

The dependent variable of the study was business resilience which was measured using, flexibility, timeliness, collaboration and digitalization. The results are presented in Table 4.7

Table 4.7 Descriptive Analysis of Business Resilience

Flexibility	N	Sum	Mean	Std. Deviation
The firm has put in place mechanism to support the continuity of the firm operations	67	270.00	4.0299	1.01459
The firm has been able to adjust operations during the pandemic with minimal disruption in serving our customers	67	253.00	3.7761	1.01236
The firm has policies in place to support flexible changes in our supply chain	67	262.00	3.9104	.94918
The firm has capability of volume flexibility to provide ways to adapt and adjust to volume changes in orders to meet supplier demands and avoid problems with inventory levels	67	245.00	3.6567	1.14881
The firm has Scheduling flexibility that allows for changes in production and delivery schedules	67	253.00	3.7761	.99728
Timeliness				
The firm ensures that timeliness is maintained in meeting our customers' orders and solving complaints	66	252.00	3.8182	1.03640
The firm ensures there is real-time information sharing with our supplier network	66	247.00	3.7424	1.04234
When an interruption occurs, the organization's supply chain quickly changes its state of operation to adapt	67	251.00	3.7463	.95890
The company can measure the cash-to-cash (C2C) cycle, sometimes called cash conversion, which tracks how long it takes a business to transfer money to suppliers while getting it from customers.	67	250.00	3.7313	.94680
The company can determine the supply chain cycle time, which is at comprehensive metric used to determine how long it would take to complete a customer order	67	255.00	3.8060	.97295
Collaboration				
The company's supply chain has the ability to recover important knowledge in the event of an interruption	67	256.00	3.8209	1.05780
The firm maintains supplier alliances that enhance the operational performance	67	258.00	3.8507	1.06250
Through cooperative planning and forecasting, the company regularly works with our suppliers to forecast demand	67	243.00	3.6269	1.13932
The firm utilizes a robust review process in recruiting new suppliers to ensure there is minimal disruption in our production processes	67	251.00	3.7463	1.07792
The firm has capability of supply chain partners collaborating on planning and redesign processes	67	253.00	3.7761	.96642
Digitalization				
The firm has integrated a digitalized platform in management of suppliers to foster the supply performance	66	250.00	3.7879	1.11652
The firm leverages on digitalized data analysis to optimize the supply chain	67	249.00	3.7164	.99706
The digitalization of the supply chain provides the firm with an end-to-end visibility of the supply chain	67	250.00	3.7313	.99365
The utilization of digitalized supply chain allows the firm to efficiently handle complaints and manage a feedback loop with our suppliers and distributors	67	253.00	3.7761	.99728
The digitalization of the supply chain supports seamless supply planning and helps in reducing costs for the firm	67	258.00	3.8507	1.04814
Average	66		3.7838	1.02681

Source: Research Data (2023)

Regarding flexibility, the respondents indicated to a high degree, the firm has put in place mechanism to support the continuity of the firm operations (mean = 4.029, dev = 1.014). Results showed to a high degree (mean = 3.776, dev = .997) the firm has scheduling flexibility that allows for changes in production and delivery schedules. Concerning the timeliness during the pandemic respondents revealed that to a high degree the firm ensures there is real-time information sharing with our supplier network (mean = 3.742, dev = 1.042). Further, to a high degree when an interruption occurred the organization's supply chain quickly changed its state of operation to adapt (mean = 3.746, dev = .958).

With regard to collaboration results demonstrated to a high degree the company's supply chain has the ability to recover important knowledge in the event of an interruption (mean = 3.820, dev = 1.057). Results show to a high degree through cooperative planning and forecasting, the company regularly works with our suppliers to forecast demand (mean = 3.626, dev = 1.139). On digitalization, the respondents indicated to a high degree digitalization of the supply chain supports seamless supply planning and helps in reducing costs for the firm (mean = 3.850, dev = 1.048). A mean of 3.787 confirmed to a high degree the firm has integrated a digitalized platform in management of suppliers to foster the supply performance.

4.4 Correlation Analysis

The research sought to determine the direction of association between the independent and dependent variables. Correlation tests were conducted and the results are shown in Table 4.8 below.

Table 4.8 Correlation Analysis

			Business Resilience	Upstream Operations	Internal Operations	Downstream Operations
Spearman's rho	Business Resilience	Correlation Coefficient	1.000			
		Sig. (2-tailed)	.			
		N	67			
	Upstream Operations	Correlation Coefficient	.158	1.000		
		Sig. (2-tailed)	.203	.		
		N	67	67		
	Internal Operations	Correlation Coefficient	.462**	.221	1.000	
		Sig. (2-tailed)	.000	.073	.	
		N	67	67	67	
	Downstream Operations	Correlation Coefficient	.584**	.402**	.417**	1.000
		Sig. (2-tailed)	.000	.001	.000	.
		N	67	67	67	67
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: Research Data (2023)

The findings to establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya showed that upstream operations had a positive insignificant relation with the business resilience of the manufacturing firms (r = .158, N (67), sig = .203>.05). The correlation test further established that internal operation had a weak positive relation with the level of business resilience in the manufacturing firms (r = .462**, N (67), sig = .000<.05). Lastly, the tests result confirmed there was a moderate positive and significant association between downstream operations and the business resilience of manufacturing firms (r = .584**, N (67), sig = .000<.05).

4.5 Regression Analysis

The research adopted a multiple linear regression as stated in the methodology and the summary of the analysis is shown in this section. The aim of the regression was to estimate the predictive power of upstream operations, internal operations, and downstream operations on the composite measure of business resilience in the manufacturing industry.

Table 4.9 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.722[a]	.521	.499	10.75153

a. Predictors: (Constant), Downstream Operations, Internal Operations, Upstream Operations

Source: Research Data (2023)

The regression analysis results above showed the study yielded a r-square = .521 which signified that holding other factors constant Covid-induced supply chain disruptions (internal, downstream and upstream operations) positively predicted 52.1% of the changes in the business resilience of the manufacturing firms.

Table 4.10 ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7932.236	3	2644.079	22.874	.000[b]
	Residual	7282.511	63	115.595		
	Total	15214.746	66			

a. Dependent Variable: Business Resilience

b. Predictors: (Constant), Downstream Operations, Internal Operations, Upstream Operations

Source: Research Data (2023)

The ANOVA analysis was conducted to determine the statistical significance of the regression conducted in the research. The results showed a f-calculated = 22.874 with sig = .000<.05 which revealed there was a positive and significant influence of Covid-19 induced supply chain disruptions on the business resilience of manufacturing firms.

Table 4.11 Regression Coefficient Summary

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.725	8.535		2.780	.007
	Upstream Operations	-.412	.348	-.115	-1.182	.242
	Internal Operations	.628	.197	.298	3.181	.002
	Downstream Operations	1.944	.331	.604	5.869	.000

a. Dependent Variable: Business Resilience

Source: Research Data (2023)

From the above coefficients we can plot the final research model as;

$$Y = 23.725 + -.412X_1 + .628X_2 + 1.944X_3 + 8.535$$

The regression coefficient for upstream operations was ***β_1 = -.412, t = -1.182, sig = .242>.05*** implying that upstream operations did not have a significant effect on the level of business resilience in the manufacturing firms. The results further yielded a coefficient of internal operations; ***β_2 = .628, t = 3.181, sig = .002<.05.*** These findings showed that changing the level of internal operations by a unit within the manufacturing firms will result in an improvement in the business resilience by a unit of .628. Lastly, the study coefficient for downstream operations yielded was ***β_3 = 1.944, t = 5.869, sig = .000<.05.*** The implication of the findings is there was positive significant effect of the variable; thus, changing downstream by one unit will significantly improve business resilience by a factor of 1.944.

4.6 Discussion of Findings

Regression analysis from the study revealed that there was a positive and significant influence of Covid-19 induced supply chain disruptions on the business resilience of manufacturing firms. This means that Covid-induced supply chain disruptions positively predicted 52.1% of the changes in the business resilience of the manufacturing firms. The study findings were in line with Ndemezo, Ndikubwimana and Dukunde (2018) who found a

significant effect of financial incentives on capacity utilization of beverage and food companies in Rwanda. Shou, Prester and Li (2018) also investigated the connection between supply chain collaboration and business performance and revealed a strong positive link between the variables. Arusei and Musau (2020) also focused on how collaboration with suppliers affects performance and showed that supplier collaboration facilitates relationship building between suppliers and buyers, improves sharing of resources through partnerships and joint investment, enhances transparency and reliability of the supply chain, thereby adding significant value to the organization which was in line with the study findings. The findings were further corroborated by Quayson, Bai and Osei (2020) who found out that technology was a crucial tool for business sustainability by increasing inclusion through facilitation of digital payments, increasing connectivity between relevant parties and exposing firms to higher quality information.

Findings from the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya revealed that upstream operations did not have a significant effect on the level of business resilience in the manufacturing firms. The study findings were however disputed by Marusak, Sadeghiamirshahidi, Krejci, Mittal, Beckwith, Cantu, and Grimm (2021) who noted a significant effect of the food supply chain system in terms of raw material and the rate of food supply to customers. Further, Budler, Jakšič and Vilfan (2021) noted that companies have opted to outsource upstream tasks including warehousing, transportation, and financial management, resulting in lowered operational costs and improved access to high-quality information which was not in line with the study findings. Additionally, Mwangi, Ragui, and Arani (2021) showed that supplier collaboration considerably boosts retail outlets' success by encouraging the development of collaborative market entrance strategies, improving outsourced relationships, and raising supplier contract performance.

The second objective, to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, sought to identify the effect of internal operations on the business resilience in the manufacturing firms. The analysis revealed that the level of internal operations showed a significant effect on the level of the business resilience in manufacturing firms. The findings were corroborated by Shou, Zhao, Dai and Xu (2021) who determined that operational innovation measured by matching of traceability and internet-based supply chain coordination (SCC) increases a firms' superiority. Additionally, Ketudat and Jeenanunta (2021) established that businesses with well-established internal strategies including well communicated continuity plan, diversification of products and services, integration of IT systems and the leadership type were key to determining the firms' stability during the pandemic, which was in line with the study findings. In a study by Mulyadi and Hendrayati (2021) noted that the relationships among organizational pro-social behaviour, flexibility, and collaborative abilities was key in business resilience as per the current study findings.

The findings from the analysis to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, revealed that there was positive significant effect of downstream operations on the business resilience in the manufacturing firms. The study findings were fully corroborated by Njuguna, Arani and Onyara (2021) who determined that performance and sustainability could be enhanced through enhancing sell operations including market information integration, lean supply chain management and outsourcing. The study was also supported by Chakraborty (2023) who noted a significant change in the market forces and equilibrium brought about by the COVID-19 pandemic's unanticipated hazard as per the study findings.

The study findings were further supported by the dynamic capabilities theory and the systems theory which anchored this research. The theory noted that the capabilities of the firm are vital to the response of the firm to the disruptions that were brought about by the pandemic. The study findings were in line with these assertions as internal and downstream operations including digitalized supply chains enhances business resilience. The systems theory was also in line with the study findings which noted the significance of technology integration to business resilience. Additionally, the study confirms the importance of collaboration and logistics outsourcing towards long-term resilience.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary of findings then conclusion and recommendations for further studies. The chapter further highlighted the various limitations that were faced when conducting the research as well as areas for further research that can be conducted in the future.

5.2 Summary of Findings

This study investigated the impact the supply chain disruptions induced by covid -19 had on business resilience among the food and beverage manufactures in Nairobi County, Kenya. The objectives were formulated, and these were to: establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County and to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County. Specifically, they sought to examine the effect of upstream operations, internal operations and downstream operations on business resilience of food and beverage manufacturing firms in Nairobi County. The theoretical framework for the study was based on dynamic capabilities and systems theory with dynamic capabilities being the main theory used.

Correlation tests were conducted and the findings on the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya, showed that upstream operations had a positive insignificant relation with the business resilience of the manufacturing firms. The correlation test further established that internal operation had a weak positive relation with the level of business resilience in the manufacturing firms. Lastly, the tests result confirmed there was a moderate positive and significant association between downstream operations and the business resilience of manufacturing firms.

The regression analysis results revealed that there was a positive and significant influence of Covid-19 induced supply chain disruptions on the business resilience of manufacturing firms.

The results to establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya found that upstream operations did not have a significant effect on the level of business resilience in the manufacturing firms. The results further showed that internal operations had a significant effect on the level of business resilience Lastly, downstream operations demonstrated a positive significant effect on business resilience.

5.3 Conclusion

Based on the findings from the first objective of your study which is to establish the extent of Covid-19 induced supply chain disruption, in food and beverage manufacturing Firms in Nairobi County, Kenya, it can be concluded that there is no significant impact of Covid-19 induced supply chain disruptions on the upstream operations of food and beverage manufacturing firms in Nairobi County, Kenya, concerning their overall business resilience. This suggests that despite the challenges faced in the upstream operations due to the disruptions caused by the pandemic, these challenges do not appear to have a substantial negative effect on the firms' ability to maintain or recover their business resilience.

The findings from the second objective which is to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, indicate a significant effect of internal operations on the business resilience of manufacturing firms leading to the conclusion that the internal management strategies and practices play a crucial role in determining the level of business resilience. The study further concluded that cross-functional management and periodic interdepartmental meetings are widely utilized, indicating a positive trend in terms of integrating different functional units and a high level of communication and collaboration

across departments. Additionally, the coordination with the marketing team among these manufacturing firms is perceived as successful, highlighting the importance of interdepartmental collaboration. there is awareness of strategic plans within the firm, emphasizing the importance of aligning internal operations with strategic goals. The study also concludes that there exists extensive sharing of information, alignment of systems across all functional units and visibility of processes inside the company, emphasizing the importance of transparency and understanding of internal operations.

The findings from the second objective which is to find out the influence of Covid-19 induced supply chain disruptions on business resilience of food and beverage manufacturing firms in Nairobi County, Kenya, revealed a positive and significant effect of downstream operations on the business resilience of manufacturing firms in Nairobi County. Based on these findings, the study concluded that the way companies manage and adapt their operations downstream has a substantial impact on their overall resilience in the face of challenges such as those induced by the Covid-19 pandemic. The study further concluded that government restrictions, cancellation of face-to-face meetings with customers, transportation disruptions restricted the firm's ability to reach customers which resulted in adverse effects on sales. The study therefore suggests that firms that effectively address and navigate these challenges demonstrate higher levels of business resilience. The study therefore underscores the importance of effectively managing downstream operations, including customer interactions, distribution channels, and sales strategies, to enhance the overall business resilience of food and beverage manufacturing firms in Nairobi County.

5.4 Recommendations

The study concluded that there was a positive and significant influence of Covid-19 induced supply chain disruptions on the business resilience of manufacturing firms. Based on this conclusion, the study provides some recommendation to the relevant policy makers. The

Government through the trade Ministry of Trade and Investment should design policies and initiatives to support firms in managing challenges in downstream operations including collaborating with relevant stakeholders to create flexible regulations, facilitating the adoption of digital communication tools, and exploring innovative solutions for product delivery during periods of restriction. Further, considering the negative impact on sales and turnover during the pandemic, the government could explore the possibility of financial support programs, including grants or low-interest loans, to help manufacturing firms' weather economic downturns and sustain their operations.

The Kenya Association of Manufacturers should also encourage and champion for the adoption of technology and digitalization within the industry to enhance operational efficiency and flexibility. This includes promoting e-commerce platforms, digital marketing strategies, and other technologies that facilitate remote operations and customer engagement. The association should also invest in capacity-building programs for firms to strengthen their ability to adapt to unforeseen disruptions. This may include training programs on crisis management, business continuity planning, and the development of skills relevant to navigating challenges in the business environment. KAM can also facilitate collaboration between the government and private sector to address common challenges. Establishing platforms for dialogue and information exchange can foster a more resilient business environment.

The study further provides practical recommendations or food and beverage manufacturing firms. The study recommends that firms should diversify the supplier base to reduce dependence on a single source for critical raw materials. Establishing relationships with multiple suppliers can enhance flexibility and provide alternatives during supply chain disruptions. Further, firms should implement strategic inventory management practices to

buffer against supply chain uncertainties. This can be achieved by maintaining adequate stock levels of essential raw materials which can help mitigate the impact of sudden disruptions.

The study also recommends that firms embrace technology solutions for supply chain visibility and automation to enhance real-time monitoring, enabling swift responses to disruptions and improving overall operational efficiency. Further, they should invest in digital communication platforms including virtual meeting tools, collaborative project management platforms, and internal communication channels to facilitate remote collaboration and maintain effective communication, particularly during periods when face-to-face interactions are limited. Firms should also provide cross-functional training for employees to enhance collaboration and communication across different departments to ensure that teams can work cohesively, especially during challenging periods, contributing to improved internal operations. Firms should also develop agile distribution strategies that can quickly adapt to changing circumstances, such as disruptions in transportation by exploring alternative delivery methods and distribution channels to ensure product availability for customers, reduced disruptions and ultimately business resilience.

5.5 Limitations of the Study

The study encountered various limitations. The study's findings may be influenced by the availability of respondents. Certain key individuals in the selected target population were unavailable for participation reducing the sample size. The closure of some businesses within the COVID-19 period may have impacted the representativeness of the sample. This limitation can be mitigated by using a combination of random sampling and purposive sampling to capture diverse perspectives. Lastly, delays in obtaining necessary permits impacted the study timeline, potentially affecting the relevance of the findings to the current business environment. This was mitigated by planning the research timeline and starting the permit application process well in advance.

5.6 Suggestions for Further Studies

The study was focused on the food and beverage manufacturing industry. Further studies can be conducted on the resilience strategies employed by other industries as well as small and medium-sized enterprises in Kenya. The study would investigate the unique challenges faced by SMEs and identify tailored approaches to enhance their ability to withstand disruptions. Adoption of technology was identified as a major recommendation for Covid -19 disrupted firms. Studies can be conducted on how the adoption of industry technologies have contributed to the resilience of manufacturing firms. Further studies can also be conducted to examine how manufacturing firms are adapting their resilience strategies post-pandemic. Here, studies can assess the speed and effectiveness of recovery efforts, identifying critical success factors for swift resumption of operations as well as to identify lessons learned from the Covid-19 experience and assess the integration of these lessons into future resilience planning. The research was limited since it focused on food and beverages firms in a single county and moreover, the study solely relied on Covid-19 as one of the global pandemics that induced supply chain disruptions. Moreover, future studies should focus on similar research in different sectors and expand the scope of global pandemics beyond Covid-19 to determine their impact on supply chain disruptions and business resilience.

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APPENDICES

Appendix I: Questionnaire

Hello, I'm a student at the University of Nairobi; currently undertaking an MBA degree. I'm requesting for your support in answering to the attached questionnaire. The goal of the research is to establish effect of covid 19 induced supply chain disruptions on business resilience of beverage and food manufacturing companies in Nairobi County.

Your organization has been carefully chosen to partake in the survey due to inclusion in reputable company that are registered with the Kenya Association of Manufactures. Participation in this study will be treated with supreme discretion and information obtained will only be utilised for the stated academic objectives. Inclusion in the survey is entirely voluntary and at any point you can reverse your willingness to be a participant.

Thanks so much for being part of this study. If need be; the survey findings can be provided upon conclusion.

Regards,

Hellen Njehia.

Part A: Demographic Information

1. **Kindly specify your gender?**

   Male ( )

   Female ( )

2. **How best would you categorize your position within the firm?**

   Executive Management ( )

   Senior Manager ( )

Middle Level Manager ( )

3. **How long has your firm been operating within the food and beverage manufacturing firms in Nairobi County? (values in years)**

Not more than 3 ( )

4 to 6 ( )

7 to 10 ( )

More than 11 ( )

PART B: THE EXTENT OF SUPPLY CHAIN DISRUPTIONS DURING THE COVID 19 PANDEMIC PERIOD

Kindly show your extent on how you agree with these statements using the shown scale below;

1= very low degree, 2= low degree, 3 = average, 4= high degree and 5 = very high degree.

No.	Upstream operations	1	2	3	4	5
1.	The pandemic had substantial negative effects on the firms supply chain					
2.	Covid 19 impacted the capacity of our suppliers to produce orders for raw materials					
3.	Covid 19 negatively affected our lead times for imported raw material					
4.	The cost of raw materials increased during the pandemic					
5.	The cost of freight for imported materials increased during the pandemic					
6.	All face-to-face meetings with suppliers were cancelled during the pandemic resulting to delays in resolving issues					

No	Internal Operations	1	2	3	4	5
1	Cross functional management is widely utilised					
2	Periodic interdepartmental meetings are commonly utilised					
3	The coordination with marketing team is successful					
4	There is awareness of strategic plans to the appropriate parties within the firm					
5	Sharing of information inside the firm is extensive					
6	Alignment of systems across all functional units have been achieved					
7	There is a visibility of processes inside the company					

No.	Downstream operations	1	2	3	4	5
1	Government restrictions, negatively impacted on our ability to reach customers					
2	All face-to-face meetings with customers were cancelled during the pandemic resulting to reduced turnover					
3	Transportation to access our customers to deliver products was disrupted					
4	The distribution channels were negatively impacted hence compromising customer engagements					
5	The product delivery to customers was impacted as government restriction forced restricted access to some outlets					
6	The sales of the organisation were negatively impacted during the pandemic					

PART C: TO WHAT EXTENT HAS YOUR ORGANISATION RESPONDED TO EMBED THE NECESSARY MEASURES FOR BUSINESS RESILIENCE TO MITIGATE SUPPLY CHAIN DISRUPTIONS OCCASIONED BY COVID -19 PANDEMIC?

Kindly indicate in a scale between 1 and 5;

1= very little degree, 2= little degree, 3 = average, 4= great degree and 5 = very great degree.

No.	Business Resilience	1	2	3	4	5
Flexibility						
ii.	The firm has put in place mechanism to support the continuity of the firm operations					
iii.	The firm has been able to adjust operations during the pandemic with minimal disruption in serving our customers					
iv.	The firm has policies in place to support flexible changes in our supply chain					
v.	The firm has capability of volume flexibility to provide ways to adapt and adjust to volume changes in orders to meet supplier demands and avoid problems with inventory levels.					
vi.	The firm has Scheduling flexibility that allows for changes in production and delivery schedules					
Timeliness						
vii.	The firm ensures that timeliness is maintained in meeting our customers orders and solving complaints					
viii.	The firm ensures there is real-time information sharing with our supplier network.					
ix.	When an interruption occurs, the organization's supply chain quickly changes its state of operation to adapt.					
x.	The company can measure the cash-to-cash (C2C) cycle,					

	sometimes called cash conversion, which tracks how long it takes a business to transfer money to suppliers while getting it from customers.					
xi.	The company can determine the supply chain cycle time, which is aT comprehensive metric used to determine how long it would take to complete a customer order.					
Collaboration						
xii.	The company's supply chain has the ability to recover important knowledge in the event of an interruption.					
xiii.	The firm maintains supplier alliances that enhance the operational performance					
xiv.	Through cooperative planning and forecasting, the company regularly works with our suppliers to forecast demand.					
xv.	The firm utilizes a robust review process in recruiting new suppliers to ensure there is minimal disruption in our production processes.					
xvi.	The firm has capability of supply chain partners collaborating on planning and redesign processes,					
Digitization						
xvii.	The firm has integrated a digitalized platform in management of suppliers to foster the supply performance					
xviii.	The firm leverages on digitalized data analysis to optimize the supply chain					
xix.	The digitalization of the supply chain provides the firm					

	with an end-to-end visibility of the supply chain					
xx.	The utilization of digitalized supply chain allows the firm to efficiently handle complaints and manage a feedback loop with our suppliers and distributors					
xxi.	The digitalization of the supply chain supports seamless supply planning and helps in reducing costs for the firm.					

Thank you for the Participation

Appendix II: Food and Beverage firms in Nairobi

1. Africa Spirits Ltd
2. Agriner Agricultural Development limited
3. Alliance One Tobacco Kenya Ltd
4. Al-Mahra Industries Ltd
5. Alpha Fine Foods Ltd
6. Alpine Coolers Ltd
7. Annum Trading Company Limited
8. Aquamist Ltd
9. Bakex Millers Ltd
10. Belfast Millers Ltd
11. Bidco Africa Ltd
12. Bio Foods Products Limited
13. Breakfast Cereal Company (K) Ltd
14. British American Tobacco Kenya Ltd
15. Broadway Bakery Ltd
16. Brookside Dairy Ltd
17. C.Czarnikow Sugar (EA) ltd
18. Cadbury Kenya Ltd
19. Candy Kenya Ltd
20. Capwell Industries Ltd
21. Carlton Products (EA) Ltd
22. Centrofood Industries Ltd
23. Chirag Kenya Limited
24. Coca-Cola East Africa Ltd
25. Confec Industries (E.A) Ltd
26. Corn Products Kenya Ltd
27. Crown Foods Ltd
28. Cut Tobacco (K) Ltd
29. Del Monte Kenya Ltd
30. DPL Festive Ltd
31. E & A Industries Ltd
32. East African Breweries Ltd
33. East African Sea Food Ltd
34. East African Seed Co. Ltd
35. Eastern Produce Kenya Ltd
36. Erdemann Co. (K) Ltd
37. Excel Chemicals Ltd
38. Farmers Choice Ltd
39. Frigoken Ltd
40. Giloil Company Limited
41. Glacier Products Ltd
42. Global Allied Industries Ltd
43. Global Beverages Ltd
44. Global Fresh Ltd
45. Gonas Best Ltd
46. Hail & Cotton Distillers Ltd
47. Highlands Canners Ltd
48. Highlands Mineral Water Co. Ltd
49. Homeoil
50. Insta Products (EPZ) Ltd
51. Jambo Biscuits (K) Ltd
52. Jetlak Foods Ltd
53. Karirana Estate Ltd
54. Kenafric Industries Limited
55. Kenblest Limited
56. Kenya Breweries Ltd
57. Kenya Nut Company Ltd

58. Kenya Sweets Ltd
59. Kenya Tea Development Agency
60. Kenya Wine Agencies Limited
61. Kevian Kenya Ltd
62. Koba Waters Ltd
63. Kwality Candies & Sweets Ltd
64. Lari Dairies Alliance Ltd
65. London Distillers (K) Ltd
66. Mafuko Industries Ltd
67. Manji Food Industries Ltd
68. Melvin Marsh International
69. Mini Bakeries (Nbi) Ltd
70. Miritini Kenya Ltd
71. Mount Kenya Bottlers Ltd
72. Nairobi Bottlers Ltd
73. Nairobi Flour Mills Ltd
74. Nairobi Java House Ltd
75. NAS Airport Services Ltd
76. Nestle Kenya Ltd
77. Nicola Farms Ltd
78. Palmhouse Dairies Ltd
79. Patco Industries Limited
80. Pearl Industries Ltd
81. Pembe Flour Mills Ltd
82. Premier Flour Mills Ltd
83. Premier Food Industries Limited
84. Proctor & Allan (E.A.) Ltd
85. Promasidor (Kenya) Ltd
86. Rafiki Millers Ltd
87. Razco ltd
88. Re-Suns Spices Limited
89. Sameer Agriculture & Livestock (Kenya) Ltd
90. Smash Industries Ltd
91. Softa Bottling Co. Ltd
92. Spice World Ltd
93. Spin Knit Dairy Ltd
94. Sunny Processors Ltd
95. Super Bakery Ltd
96. Tropical Heath Ltd
97. Trufoods Ltd
98. UDV Kenya Ltd
99. Unga Group Ltd
100. Usafi Services Ltd
101. Uzuri Foods Ltd
102. ValuePak Foods Ltd
103. W. E. Tilley (Muthaiga) Ltd
104. Wrigley Company (E.A.) Ltd

COVID 19 INDUCED SUPPLY CHAIN DISRUPTIONS AND BUSINESS RESILIENCE OF FOOD AND BEVERAGE MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

ORIGINALITY REPORT NAME: Dr. Kipkorir M. Chirchir Date: 20/11/2023

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