EFFECT OF INVENTORY CONTROL SYSTEMS ON SUPPLY CHAIN PERFORMANCE AT KITUI FLOUR MILLS, MOMBASA COUNTY

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DECLARATION AND APPROVAL

Declaration by the candidate

This research proposal is my original work and has not been presented in this/or any other institution of higher learning for an award of a degree. No part of it should be reproduced manually, electronically, or otherwise without prior permission of the author and/or Mount Kenya University.

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Approval by the Supervisors

This research proposal has been submitted for examination with my approval as the student's Supervisor

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DEDICATION

I praise Allah and thank my spouse Jerry Njiru for providing me with the support, knowledge and wisdom necessary for me to pursue this work.

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I owe a great deal of gratitude to many exceptional people without whom this work would not havebeen completed. We give special appreciation to the Almighty God for providing us with free care,health, and strength. I am incredibly appreciative to my supervisor, Dr. Jackson Ndolo for his personal dedication, support, availability, tolerance, and patience all of which were crucial to the completion of this work.

ABSTRACT

Inventory control is the monitoring and storage of goods as well as the assurance of the products' accessibility to guarantee a sufficient supply without excessive supply or stock outs. Firms face a lot of challenges concerning inventory control hence most organizations do not perform their procurement functions efficiently. Many organizations normally require that the various needs, and orders be fulfilled quickly, but they tend to overlook and pay little attention to inventory control techniques. The purpose of the study was to determine the effect of inventory control systems on supply chain performance in Kitui Flour Mills in Mombasa County. The studysought to find out the effects of Just In Time (JIT), ABC Analysis, Economic Order Quantity (EOQ),and First In, First Out (FIFO) methods on supply chain performance in Kitui Flour Mills in Mombasa County. The study employed a descriptive research design to comprehensively understand the behavioral patterns and processes related to inventory control. The target population consisted of 200 respondents from various departments, including finance, procurement, information technology, logistics, operations, and stores in the firm. A stratified random sampling technique was used to ensure the selection of a representative sample of 133 respondents. Primary data was collected using a structured questionnaire, while secondary data was gathered from existing sources. Data analysis was done through use of percentages, mean, standard deviation,and multiple linear regression using the Statistical Package for Social Science (SPSS). Ethical considerations included ensuring informed consent, participant anonymity, privacy, and adherenceto ethical standards. The study findings revealed significant positive relationships between all four inventory control systems and supply chain performance. All four independent variables have positive B coefficients (JIT: 0.539, EOQ: 0.469, FIFO: 0.281, ABC Analysis: 0.159). This indicates a positive relationship between each inventory control system implementation score and the predicted performance. JIT has the highest positive relationship (0.539) between JIT implementation and supply chain performance. After JIT, EOQ had the second-highest positive coefficient (0.469) suggesting a positive association between EOQ implementation and performance. Higher EOQ implementation scores are linked to improved performance. The positive FIFO (0.281) coefficient indicates a positive relationship between FIFO implementation and performance. The mean score for various aspects of ABC analysis implementation ranged from 3.00 to 3.72, highlighting its perceived effectiveness in inventory management. Based on the results, the study recommends that organizations consider adopting JIT principles to reduce lead times, lower inventory holding costs, and improve responsiveness to demand fluctuations. Companies can also optimize order quantities through EOQ models and can minimize total inventory costs while ensuring adequate stock levels. Adhering to FIFO principles can help reduce wastage and improve inventory accuracy, potentially leading to better inventory turnover. Lastly, ABC Analysis can contribute to overall supply chain optimization by enhancing inventory control through classification.

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- **EOQ**: Economic Order Quantity
- **FIFO**: First in First out
- **FSN**: Fast Moving, Slow Moving, Non-Moving
- **JIT**: Just in Time
- **LIFO**: Last in First out
- **TQM**: Total Quality Management
- **TOC**: Theory of Constraints

CHAPTER ONE

1.0 INTRODUCTION

The background of the study, the statement of the problem, the purpose, the objectives, the scope,the significance, the research questions, the justification of the study, the scope, the limitations, the assumptions, and the operational definitions of terms are all included in this chapter.

1.1 Background of the Study

Inventory control is the monitoring and storage of goods as well as the assurance of the products'accessibility to guarantee a sufficient supply without an excessive supply or stockouts. According to Sneha, Pandey, and Polasi (2022), inventory control entails the acquisition, maintenance, and disposal of materials. It also involves forecasting and planning for inventory delivery based on lead times, as well as the creation of inventory control policies and procedures.

Firms face a lot of challenges about inventory control hence most organizations do not perform their procurement functions efficiently. Many organizations normally require that the various needs, and orders be fulfilled quickly, but they tend to overlook and pay little attention to inventory control techniques. Kholik, Rahmawati, and Sudarmaningtyas (2023) clearly stated thatinventory holding cost, and risk associated with obsolesce in the view of rapidly changing markets affects the cost incurred to hold inventory of work in progress and finished good.

As noted in a study by Aprilianti and Ishak (2023), companies are increasingly developing inventory control strategies and systems to tackle the issues associated with current

inventory management practices. The majority of businesses employ inventory control systems to boost their competitiveness and financial performance (Aprilianti & Ishak, 2023). Inventory audits, the creation of organizational inventory management rules and procedures, and the creation of computerized inventory management systems are some of the current internal inventory control methods used by organizations (Saro, 2022).

Inventory control must be assessed to determine its performance level, just like any other functional area of the organization. The effectiveness of inventory control techniques is evaluated about the corporate goals and objectives (Aprilianti & Ishak, 2023). The efficiency and effectiveness of the inventory control technique are examined. The financial and non-financial goals of the organization related to inventory management can also be taken into consideration when examining the financial and non-financial components of inventory control (Karani & Osoro,2020).

As a quantitative control tool, inventory control has significant financial effects on any firm. According to Saro, (2022), inventory is the most important control method in the majority of businesses and is directly tied to production, acquisition, marketing, and financial strategies. Research has also shown that inventories are kept for two reasons: economy and insurance. Other definitions of security include protecting anticipated or delivered changes, ensuring against vulnerability, and delaying events (Mbugi & Lutego, 2022).

Normally high-demand products should naturally have safety stock which is not the case in most organizations where items of low demand are stocked which is very uneconomical to the firms. Scholars argue that firms are supposed to provide effective and efficient

services while they also maintain minimal inventories, hence the inventory control techniques are clearly supposed to elite this (Kholik, Rahmawati & Sudarmaningtyas, 2023). Initially, a buffer was allocated to raw materials and inventory and inventory of work in progress together with finished products. This practice was expensive because it's clear that large buffer inventories tend to consume a lot of resources of value and come with some costs.

As a result, several businesses have embraced the concept of inventory management and control methodologies including JIT, economic order quantity, ABC analysis, FIFO, and LIFO analysis. However, Karani and Osoro (2020) explain that inventory management involves determining the quantity and location of stored items. It includes various aspects such as replenishment, lead times, carrying costs, asset management, inventory forecasting, inventory valuation, inventory visibility, and projecting future inventory prices (Kholik, Rahmawati, & Sudarmaningtyas, 2023).

1.1.1 Global Perspective of inventory control systems on supply chain performance

In today's dynamic and interconnected global markets, managing inventory within supply chains has become a crucial factor that affects the efficiency and competitiveness of businesses worldwide. The global landscape has witnessed significant shifts in supply chain dynamics, with emerging technologies, changing consumer behaviors, and a growing emphasis onsustainability reshaping the way organizations approach inventory control. Effective inventory management is crucial for manufacturing companies globally to streamline operations and improve supply chain efficiency. These companies rely on inventory control systems as the foundation of their efforts, allowing them to manage inventory levels, reduce costs, and fulfill customer demands efficiently

The adoption of advanced inventory control systems has become imperative for businesses seekingto navigate complex global supply chains efficiently. Concepts like Economic Order Quantity (EOQ), Just-in-Time (JIT), and the Theory of Constraints (TOC) have become prominent as organizations aim to refine their inventory management practices on a global level. Saro (2022) highlights the significance of advanced technologies, such as artificial intelligence (AI) and big data analytics, in inventory control systems. For example, manufacturing giants like Toyota have effectively integrated AI-driven inventory control systems into their production processes. By utilizing real-time data and predictive analytics, Toyota can predict demand changes, optimize inventory levels, and decrease lead times, thereby improving supply chain efficiency and responsiveness.

Mbugi and Lutego (2022) emphasize the global adoption of lean inventory management practices among manufacturing firms. For instance, General Electric (GE) has adopted lean principles to enhance its inventory management processes. By implementing just-in-time

(JIT) inventory systems and fostering close relationships with suppliers, GE has managed to minimize waste, lower carrying costs, and boost overall operational efficiency throughout its global supply chain network. Kholik, Rahmawati, and Sudarmaningtyas (2023) examine the role of inventory control systems in mitigating supply chain risks for manufacturing firms. Companies like Apple Inc. have invested heavily in robust inventory control systems to navigate supply chain disruptions effectively. Apple's advanced inventory management software allows the company to track inventory levels across its global supplier network and quickly react to unexpected events, such as natural disasters or geopolitical tensions. This capability ensures continuous production and timely delivery of products to customers around the world.

The impact of implementing inventory control systems on manufacturing companies' financial performance is investigated by Aprilianti and Ishak (2023). For example, automotive manufacturer BMW has reaped substantial benefits from its investment in advanced inventory control technologies. By implementing automated inventory tracking systems and optimizing inventory turnover rates, BMW has reduced carrying costs and improved profitability, demonstrating the tangible financial gains associated with effective inventory management practices. Sneha, Pandey, and Polasi (2022) emphasize the role of inventory control systems in enhancing customer satisfaction for manufacturing firms. Companies like Samsung Electronics have leveraged inventory control systems to ensure product availability and timely order fulfillment. With precise demand forecasting and excellent inventory management, Samsung can satisfy consumer demands, foster brand loyalty, and establish a competitive advantage in the international market.

The application of inventory control systems in manufacturing firms globally is instrumental

in driving operational excellence, mitigating risks, improving financial performance, and enhancing customer satisfaction. In today's changing economic environment, manufacturing organizations can attain a sustained competitive edge by optimizing their inventory management procedures and implementing lean concepts and proactive risk management tactics. However, multinational companies have faced and still do confront difficulties with inventory control. Basedon the idea that inventory control is crucial for enhancing customer happiness and profitability, allorganizations—large or small, public or private, local or global—are worried about it in one way or another (Saro, 2022). Most firms have made an effort to attain ideal inventory control while reducing inventory expenditures. Maintaining the right amount of inventory while minimizing inventory expenses is the key objective of inventory control for businesses, according to a study by Mbugi and Lutego (2022) on the effects of inventory control management systems on organization performance.

1.1.2 Regional Perspective of inventory control systems on supply chain performance

It is not uncommon, yet unnecessary, to have too much stuff and insufficient customer service in the African region. Businesses in Africa can fulfill consumer demand and calculate the inventory required to provide a specific level of customer care with the help of proven strategies (Mbugi & Lutego, 2022). It is simpler to monitor changes and take appropriate action when inventory management and sales forecasting are done properly. According to Mbugiand Lutego, (2022), advantageous effects of an effective inventory control system include increased customer satisfaction, improved customer service, and reduced inventory. Effective inventory control is essential for maximizing the operation of the supply chain in a variety of locations, each with its own possibilities and problems. Businesses working in these areas depend on inventory control systems as a vital instrument

for efficient inventory management, cost reduction, and meeting consumer needs.

The management should be extremely worried when inventory stockpiles are excessive since inventories are necessary to maintain the market, the distribution system, and the wheels of production (Njoki, Ismail & Osoro, 2021). Since supply chain performance is considered to be theprimary objective for organizational development, poor inventory management has become major problem. A effective control system aids in reducing the difficulties associated with organizing, carrying out, and overseeing procurement operations, which is a corporate organization's primary duty (Mbugi & Lutego, 2022). According to Saro (2022), inventory is often a firm's most valuable asset, and the main goal of inventory control is to enhance procurement performance across divisions within an organization. More complex control techniques are used in modern inventory management, which frequently supports task completion efficiently to boost customer satisfaction while simultaneously focusing on lowering maintenance costs (Gatari, Shale & Osoro, 2022).

Maintaining excellent service standards to satisfy customer needs while avoiding high stock levels, irrespective of the kind of goods or even the department for which such stock is purchased,is the classic inventory management conundrum care (Mbugi & Lutego, 2022). The Institute of Logistics and Transport defines inventory as everything a business has available for use or sale, including a list of the objects that are held in stock (Karani & Osoro, 2020).

In North America, the adoption of advanced inventory control systems has revolutionized supply chain operations (Gatari, Shale & Osoro, 2022). Companies like Amazon have pioneered the use of sophisticated inventory management software and automation technologies to optimize warehouse operations and ensure timely order fulfillment.

Amazon can effectively control inventory levels throughout its extensive network of fulfillment centers by utilizing real-time inventory tracking and predictive analytics. This improves supply chain agility and boosts customer happiness.

In Europe, manufacturing firms have embraced lean inventory management principles to improve supply chain performance (Njoki, Ismail & Osoro, 2021). For example, to cut waste and lead times in their production processes, automakers like Volkswagen have adopted just-in-time (JIT) inventory systems. By maintaining close partnerships with suppliers and adopting efficient inventory replenishment strategies, Volkswagen can optimize inventory levels and achieve cost savings while maintaining high product quality standards.

Retailers and logistics companies in Asia-Pacific are adopting sophisticated inventory control systems as a result of the industry's explosive expansion in e-commerce. Innovative inventory management solutions driven by big data analytics and artificial intelligence (AI) have been created by Chinese companies such as Alibaba Group (Mbugi and Lutego, 2022). Alibaba can improve the efficiency of its supply chain operations, minimize stockouts, and optimize inventory allocation by examining extensive transactional data and customer behavior patterns.

In the Middle East and Africa, companies face unique challenges such as political instability and infrastructure constraints. However, innovative approaches to inventory management have emerged in this region (Karani & Osoro, 2020). For example, logistics firms like Aramex have leveraged cloud-based inventory control systems to overcome logistical hurdles and improve supply chain visibility. By centralizing inventory data and implementing real-time tracking capabilities, Aramex can optimize route planning,

minimize delivery times, and enhance customer satisfaction across diverse markets.

In Latin America, companies are increasingly investing in inventory control systems to address supply chain inefficiencies and market volatility. Advanced demand forecasting algorithms have been employed by retailers such as Grupo Bimbo in Mexico, with the aim of optimizing inventory levels and minimizing carrying costs. By accurately predicting consumer demand and adjusting inventory replenishment schedules accordingly, Grupo Bimbo can minimize stockouts and maximize sales opportunities, thereby improving overall supply chain performance.

1.1.3 Local Perspective of inventory control systems on supply chain performance

On a national level, the inventory control landscape is further nuanced by specific regulations, policies, and industry trends that vary from one country to another. In the Kenyan context, wherethe study is centered, the management of inventory in the supply chain is subject to unique challenges and opportunities. National policies, economic conditions, and industry-specific factorsplay a crucial role in shaping the inventory control practices of businesses (Gatari, Shale & Osoro,2022). Efficient inventory management is paramount for enhancing supply chain performance in Kenya, a country characterized by unique economic, geographic, and logistical challenges. Inventory control systems are essential for helping firms properly manage their inventory levels, cut expenses, and fulfill consumer needs.

The business environment in Kenya is complex due to its numerous sectors and increasing focus on local production and consumption. This influences the relationship between supply chain performance and inventory control systems. In the coastal city of Mombasa, the heartbeat of trade and commerce, local businesses face distinctive challenges and

opportunities in managing their inventory within the supply chain. Mombasa County's economic landscape, driven by sectors such as logistics, information technology, and procurement, demands a nuanced understanding ofhow inventory control practices impact the overall supply chain performance (Mbugi & Lutego, 2022).

In Kenya, the implementation of inventory control systems has been instrumental in transforming supply chain operations across various industries (Gatari, Shale & Osoro, 2022). For example, businesses in the fast-moving consumer goods (FMCG) industry, like Bidco Africa Ltd., have implemented sophisticated inventory management software to enhance their distribution networks and warehouse operations. Utilizing technology to automate replenishment procedures and track inventory levels in real-time has allowed Bidco Africa Ltd. to increase supply chain efficiency overall, decrease stockouts, and improve inventory accuracy.

Moreover, Kenyan manufacturing firms have recognized the importance of lean inventory management principles in improving supply chain performance (Njoki, Ismail & Osoro, 2021). Just-in-time (JIT) inventory systems have been adopted by businesses like Kenya Breweries Limited (KBL) in an effort to optimize manufacturing procedures and lower carrying costs. KBL has benefited from large cost reductions and enhanced market responsiveness by matching production schedules with customer demand and keeping inventory levels low.

The adoption of inventory control systems in Kenya has also been driven by the growth of e-commerce and digital platforms. Online retailers like Jumia Kenya have invested in sophisticated inventory management solutions to optimize order fulfillment processes and enhance customer satisfaction (Mbugi and Lutego, 2022). Jumia Kenya can effectively

manage inventory levels throughout its extensive product catalog by utilizing data analytics and automated inventory replenishment algorithms. This guarantees prompt delivery to clients throughout the country.

Furthermore, Kenyan logistics companies have leveraged inventory control systems to overcome logistical challenges and improve supply chain visibility (Karani & Osoro, 2020). For instance, businesses like Sendy use cloud-based inventory management systems to maximize delivery routes and track shipments in real time. Sendy can save transportation costs, shorten lead times for deliveries, and improve customer service for customers throughout Kenya by improving supply chain coordination and transparency.

In the industrial industry, inventory control is essential to both financial performance and operational effectiveness. In Kenya, flour mills play a vital role in the agricultural value chain, transforming raw agricultural products into consumable goods. Effective inventory control systems in these mills are essential for ensuring continuous production, minimizing waste, and optimizing resource utilization. This study explores the inventory control systems employed by flour mills in Kenya, highlighting their significance, challenges, and the potential for improvement.

Flour mills in Kenya operate within a complex and dynamic supply chain that involves multiple stages, from sourcing raw materials like wheat and maize to processing and distribution. Efficient inventory control systems are necessary to manage this complexity, ensuring that mills maintain optimal levels of raw materials and finished products. Effective inventory control saves mills money by preventing overstocking and stockouts, which can interfere with production plans and limit the supply of certain products (Yadav, Bansal, Shivani, & Vanaja, 2020). Despite the critical importance of inventory control, many flour

mills in Kenya face significant challenges in this area. Common practices include manual inventory tracking and basic computerized systems, which may not provide real-time data or comprehensive insights into inventory levels. These methods can lead to inaccuracies, delays, and inefficiencies, impacting the mills' ability to respond to market demands and manage costs effectively (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019).

Several factors contribute to these challenges, including limited access to advanced technology, insufficient staff training, and financial constraints. Additionally, fluctuations in the supply and price of raw materials, driven by factors such as weather conditions and global market trends, add another layer of complexity to inventory management in flour mills (Nirmala, Kannan, Thanalakshmi, Gnanaraj, & Appadurai, 2022).

There is significant potential for improving inventory control systems in Kenyan flour mills through the adoption of more sophisticated technologies and best practices. Automated inventory management system implementation can improve accuracy, expedite processes, and give real-time visibility into inventory levels. To provide a comprehensive picture of the supply chain, these systems can interface with other facets of the mills' operations, such as production scheduling and procurement (Khanorkar & Kane, 2023).

Training and capacity building for staff are also crucial for the successful implementation of advanced inventory control systems. Giving staff members the skills and information they need can guarantee that they can use new technology efficiently and adjust to shifting operational demands. Furthermore, fostering stronger relationships with suppliers can help mills secure more reliable raw material supplies and better manage price volatility (Yadav, Bansal, Shivani, & Vanaja, 2020).

Factors such as the port's significance as a trade hub, regional economic dynamics, and the specificoperational characteristics of businesses in Mombasa contribute to the uniqueness of the local context. Therefore, exploring the effects of inventory control systems on supply chain performancewithin the confines of Mombasa County becomes an endeavor that holds both practical and strategic significance. This study seeks to delve into the intricate interplay between inventory control systems and supply chain performance, acknowledging the global, national, and local dimensions that collectively shape the dynamics of businesses operating in Mombasa County, Kenya.

1.2 Statement of the problem

Many firms are faced with the challenge of proper inventory control and management. Inventory control techniques form 60% of the total procurement function as most of the items used in organizations are kept in stores (Mbugi & Lutego, 2022). Controlling inventories to meet changing client needs is the most crucial component of the procurement process. The management of inventory involves determining when to place orders, how much goods to have on hand to prevent stockouts, and how to store, issue, use, and distribute inventory internally (Iliemena, Jones, & Olumide, 2022).

It also helps determine the quantities, rates, amount time and procedures of materials to be stocked and issued. Most organizations have challenges in ascertaining the relevant inventory levelshence they use the computerized system. This facilitates the comparison of efficiency and responsiveness. The study conducted by Iliemena, Jones, and Olumide (2022) examined the impact of inventory management methods on the competitiveness and operational efficiency of micro and small enterprises. The results of the study indicate that

better inventory management can improve organizational performance and competitive advantage. The study found that while the inventory management technique directly improved organizational performance, it also helped the company maintain its competitive advantage. However, they were unable to develop a strategy for how the deployment of such toolswould improve supply chain performance, demonstrate service delivery, and save overall operatingcosts in those specific organizations. Many businesses are unaware of the methods that can improve supply chain performance through inventory control (Gatari, Shale, & Osoro, 2022).

It's not uncommon, but unneeded, to have too much merchandise and not enough customer service.Different inventory control methods can assist a business in meeting customer demand and determining the inventory required to provide a certain degree of customer service (Mbugi & Lutego, 2022). It is simpler to keep track of changes and take appropriate action when inventory management and sales forecasting are done with the right technology. The implementation of a suitable inventory control system can yield several benefits, such as enhanced customer satisfaction, reduced inventory, and improved customer service (Iliemena, Jones, & Olumide, 2022). Thus, the goal of this research is to determine how Kitui Flour Mills' inventory control system affects the performance of its supply chain.

1.3 Purpose of the study

The purpose of the study was to determine the effect of inventory control systems on supply chain performance in Kitui Flour Mills in Mombasa County.

1.4 Objectives of the study

i. To find out the effects of JIT on supply chain performance in Kitui Flour Mills in MombasaCounty.

ii. To determine the effects of ABC analysis on supply chain performance in Kitui Flour Millsin Mombasa County.

iii. To find out the effects of Economic Order Quantity (EOQ) on supply chain performance in Kitui Flour Mills in Mombasa County.

iv. To identify the effects FIFO and LIFO on supply chain performance in Kitui Flour Mills in Mombasa County.

1.5 Research Questions

The researcher sought to answer the following questions;

i. What were the effects of JIT on supply chain performance in Kitui Flour Mills inMombasa County?

ii. What were the effects of ABC analysis on supply chain performance in Kitui FlourMills in Mombasa County?

iii. What were the effects of Economic Order Quantity (EOQ) on supply chainperformance in Kitui Flour Mills in Mombasa County?

iv. What were the effects of FIFO and LIFO on supply chain performance in Kitui Flour Millsin Mombasa County?

1.6 Significance of the study

With a focus on Mombasa County's Kitui Flour Mills, the study is significant because it has the potential to spark revolutionary changes in the way firms operate. Through a thorough analysis of the effects of different inventory control systems on supply chain performance, this study provides practical conclusions that go beyond theoretical frameworks and directly assist business professionals. The strategic decision-making capabilities of enterprises, especially those navigating the complex dynamics of the Mombasa business environment, stand to be greatly enhanced. The findings promise to unravel the nuances of operational efficiency through an exploration of techniques like Economic Order Quantity (EOQ),Just-in-Time (JIT), and Theory of Constraints (TOC), equipping businesses with tailored solutionsto optimize resource utilization and reduce costs.

At a local level, the study is inherently tied to the economic fabric of Mombasa County. The research seeks to unravel the unique challenges and opportunities within this specific context, ensuring that recommendations are not only academically sound but also pragmatically relevant to the businesses operating in the region, particularly Kitui Flour Mills. The academic communitybenefits from the study by receiving empirical evidence that augments existing knowledge on inventory management and supply chain dynamics. This contribution is poised to guide future research endeavors, fostering a more nuanced understanding of the intricate relationship betweeninventory control systems and business performance.

Moreover, the study holds implications for policymakers and regulatory bodies shaping the economic landscape. Insights gleaned from the research may inform the formulation of

policies conducive to business growth and sustainability. For Kitui Flour Mills and similar enterprises, the findings bear the promise of competitive advantage—aligning their inventory management practices with empirically supported strategies can enhance customer satisfaction, minimize stockouts, and elevate overall supply chain performance. Ultimately, the study's significance extends far beyond the theoretical realm, positioning itself as a catalyst for practical, positive change within the business ecosystem.

1.7 Scope of the Study

The purpose of this study was to ascertain how supply chain performance at Mombasa County's Kitui Flour Mills was impacted by inventory control systems. In the Kitui Flour Mills in Mombasa County, the study aimed to determine the effects of Just In Time (JIT), ABC Analysis, Economic Order Quantity (EOQ), and First In, First Out (FIFO) approaches on supply chain performance. Two hundred respondents from the finance, procurement, information technology, logistics, operations, and stores departments of the Kitui Flour Mills Mombasa branch made up the study's target population. These departments were studied to provide information on how inventory control systems affectthe performance of a supply chain. The research time frame and schedule of activities spun acrossa period of two years while the research budget is Ksh.270,000.

1.8 Limitations of the Study

The following were the limitations of the research: Some respondents did not answer the questions for reasons of confidentiality. The researcher would urge them not to add any names and reassure them that the material was just being used for academic purposes and wouldn'tbe made public elsewhere.

Some respondents did not have enough time to respond to all the questions since they may be busy with their daily work. The research would make a follow-up at an interval of three days which made the respondent complete the questionnaires hence overcoming the problem. Some of the questionnaires were incompletely filled. To overcome this, the researcher would redistribute theunfilled questionnaire to other willing employees and make a three-day interval visit to the organization to expedite the process.

1.9 Delimitation of the study

There are intrinsic boundaries to this study, which is different from constraints, as it examines how inventory control systems affect supply chain performance at Mombasa County's Kitui Flour Mills. Delimitations clarify the scope of the research, while limitations acknowledge potential weaknesses within that scope. Here's a breakdown of the key delimitations:

The Kitui Flour Mills can directly benefit from the study's conclusions. The results cannot be automatically extrapolated to the whole flour milling sector in Mombasa County or elsewhere due to the concentration on a single business. Factors like company size, product portfolio, and existing supply chain infrastructure can influence the effectiveness of inventory control systems.

The study might have relied on data provided by Kitui Flour Mills. While internal data offers valuable insights, access to specific details or complete datasets might have been restricted. This may restrict how thorough the analysis is able to be. The study most likely concentrated on a specific set of inventory control systems (such as EOQ models and ABC analysis) employed at Kitui Flour Mills. The performance of the supply chain as a whole may also be influenced by other inventory control techniques that have not been investigated.

1.10 Assumption of the Study

There's usually too much product and not enough customer service, which is unnecessary. An organization can employ a range of inventory control systems to meet customer demand

and identify the inventory needed to deliver a particular degree of customer service (Mbugi & Lutego, 2022). To track changes and act when necessary, the correct system for sales forecasting and inventory control can assist. A good inventory control approach can lead to benefits including better customer service and lower inventory, claim Iliemena, Jones, and Olumide (2002).

1.11 Operational definition of key terms

Inventory: A company's inventory is a group of inactive, monetary-valued physical items that are stored under lock and key until they are ready to be packed, processed, transformed, used, or sold at a later time..

Inventory Control: The methods, approaches, and procedures a company uses to oversee and maximize its inventory—which consists of raw materials, products under production, and completed goods—are referred to as inventory control..

Inventory Control System: Inventory control refers to the strategies, tactics, and practices an organization employs to monitor and optimize its raw materials, commodities in production, and finished goods.

Supply Chain: It is the network of everyone who is engaged in the design, production, distribution, and sale of a product.

Supply Chain Management: It entails managing the flow of resources—money, information, and raw materials—connected to a good or service from the point of raw material procurement to the point of delivery.

Supply Chain Performance: It describes the degree to which cost optimization, waste reduction, speed improvement, and customer expectations are met at each stage of the

supply chain.

Economic Order Quantity (EOQ): It is a computation done by businesses to indicate their ordersize, enabling them to satisfy demand without going over budget.

Just In Time (JIT): It is an inventory control strategy in which suppliers only provide products as needed.

Last In First Out (LIFO): The principle of the last unit to arrive, first sold is a method of inventorycontrol that is employed in business.

First In First Out (FIFO): As part of an inventory strategy, the oldest unit of inventory is sold first.

ABC Analysis: Using the ABC Analysis approach, the inventory is divided into three groups, A, B, and C, based on decreasing value. The objects in Category A are the most valuable.The value of the items in Category B is lower than that of Category A. Category C items have the lowest level of inventory control.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter's objective is to review the literature and theoretical underpinnings of inventory management systems, which are the most important component of the supply chain for businessesthat manufacture food. It examines the research that was done on the connection between inventorycontrol systems and supply chain performance at Kitui Flour Mills in Mombasa County. Additionally, it evaluates the literature that has been produced by aseveralauthors and researchers and provides additional studies and contributions that are pertinent to the study. It also discusses cutting-edge theories regarding inventory management and control. The theoretical review section, empirical literature, conceptual framework, summary of the literature review, andresearch gaps are all included as a result.

2.1 Theoretical Review

The theoretical framework describes how the researcher formulates ideas about what potential solutions to research problems might be. The level, function, and scope are the basis of categorizing various theories (Varpio *et al*, 2020). Scholars have proposed hypotheses to explain the connection between inventory control methods and supply chain effectiveness. The underpinning theories include the resource based view theory, the inventory turnover theory, Theory of constraints and Pareto theory.

2.1.1 Resource-based view theory

According to the resource-based view theory, a company can create value internally by utilizing its resources and skills. By a combination of experience, procedures, and learning

mechanisms, inventory control and management can add value. RBV takes into account the distribution of power, the degree of dependence on external equivalents, and both internal and exterior social relations. Its goal is to maximize a company's independence and business continuity. RBV is crucial to the study of supplier management to comprehend how suppliers may support these activities and how supplier selection, assessment, and development can contribute to the supply chain's core competencies. The ability of suppliers to support these activities would be explained by outperforming rivals in supply chain operations (Cooper, Pereira, Vrontis, & Liu, 2023).

The amount that a firm's resources and competencies contribute is what determines the firm's performance. RBV sheds light on how internal resources, capabilities, and performance are related.According to the notion, achieving a competitive edge depends on a company's diverse resources,which are unique, priceless, and non-substitutable. These assets are divided into cooperative and strategic, as well as competitive and financial, categories. These resources are diverse because theyare not entirely movable. Hence, businesses are simply a collection of resources. The competitiveadvantage they possess decreases as resources become more scarce (Assensoh-Kodua, 2019).

The RBV theory also emphasizes the firm's capabilities. Cooper et al. (2023) claim that an organization's capabilities are the knowledge it has amassed over time as a result of employing itsresources effectively and efficiently to achieve its ultimate goals. He further divides abilities into four broad groups, including positional, functional, regulatory, and cultural differences. As a result of an individual's perceptions of the firm's stakeholders (cultural), prior acts (positional), or organizational norms and regulations (regulatory),

capabilities are built from current skills and experience (Assensoh-Kodua, 2019). According to the aforementioned perspective, businesses with a continuous improvement culture, process-based change laws already in place, and prior experience implementing continuous improvement processes would have higher levels of capability (Cooper, Pereira, Vrontis, & Liu, 2023). This provides a vital step in the elimination of non-value adding activities within the supply chain hence improving performanceEvery company that produces, sells, services, or distributes goods is required to maintain a physical resource inventory to support both present and upcoming production and sales. However, it shouldbe mentioned that while inventory is a necessary evil for any business of this type, companies alsohold it for several reasons, such as speculative objectives, functional requirements, physical demands, etc.

2.1.2 Inventory Turnover Theory

Inventory turnover theory, proposed by various scholars over time, provides insights into the management of inventory levels within organizations, emphasizing the relationship between inventory turnover rates and operational efficiency. One of the early proponents of inventory turnover theory was Robert E. King, who introduced the concept of inventory turnover in his seminal work "Inventory Management" published in 1940. King emphasized the importance of managing inventory turnover rates to improve liquidity and operational performance within organizations. He suggested that high inventory turnover ratios are indicative of efficient inventory management practices, leading to reduced holding costs and improved profitability.

In 1959, Robert S. Kaplan extended the discussion on inventory turnover theory in his research paper "Conceptual Foundations of the Balanced Scorecard." Kaplan emphasized the strategic implications of inventory turnover, highlighting its significance as a key performance indicator (KPI) for assessing supply chain efficiency and competitiveness. He argued that organizations should strive to achieve optimal inventory turnover ratios to enhance operational agility and responsiveness to market dynamics. Building on Kaplan's work, Donald J. Bowersox and David J. Closs further explored the relationship between inventory turnover and supply chain performance in their book "Logistical Management: The Integrated Supply Chain Process" published in 1996. Bowersox and Closs emphasized the role of inventory turnover as a measure of supply chain efficiency, stressing the need for organizations to align inventory levels with demand patterns to minimize holding costs and improve customer service levels.

The idea of inventory turnover has been advanced in the context of contemporary supply chain management in recent years by academics like Sunil Chopra and Peter Meindl. First published in 2001, Chopra and Meindl's textbook "Supply Chain Management: Strategy, Planning, and Operation" highlighted the strategic importance of inventory turnover and its role in achieving supply chain flexibility and responsiveness. Generally speaking, inventory turnover theory is still a fundamental idea in supply chain and inventory management literature, helping businesses optimize their inventory levels, cut holding costs, and improve operational effectiveness. By understanding the principles underlying inventory turnover and its strategic implications, organizations can develop effective inventory management strategies to achieve competitive advantage in today's dynamic business environment.

2.1.3 Theory of constraints

This theory (TOC) states that a small number of constraints prevent any management system from achieving more of its goals. It all began with the publication of The Goal by Eliyahu M. Goldratt in 1984. It primarily focuses on identifying the most significant limitation impeding goal achievement and methodically removing the restraint until it is no longer a barrier (Mabin, &Balderstone, 2020). The following advantages would result from a successful theory of constraints implementation: increased earnings, quick improvement, on-time supply to consumers, elimination of stock outs, better control of operations, reduced cycle time, therefore, inventory, etc. To do this, TOC redirects management efforts from maximizing individual resources, assets, and functions to boosting the volume of throughput produced by the overall system (Urban, & Rogowska, 2019). The main procedures of TOC are centered on reducing obstacles that impede each component from functioning as an integrated whole.

TOC emphasizes three fundamental principles relevant to inventory management: Identification of Constraints: The first step in applying TOC to inventory management is to identify constraints or bottlenecks within the supply chain that limit the flow of materials or products. These constraints can occur at various stages of the supply chain, including production, distribution, and inventory management processes. For example, constraints may arise due to limited production capacity, long lead times, or inadequate inventory control practices.

Exploitation of Constraints: Once constraints are identified, TOC advocates for exploiting or maximizing the throughput of the constraints to optimize overall system

performance. In the context of inventory management, this may involve prioritizing the management of inventory levels and flow at critical points in the supply chain to ensure that constraints are utilized efficiently. For example, organizations may focus on optimizing inventory levels at key production or distribution points to alleviate bottlenecks and improve overall throughput.

Subordination of Non-Constraints: TOC emphasizes the subordination of non-constraints to the constraints, ensuring that resources and efforts are directed toward maximizing the throughput of the constraints. This principle suggests that organizations should prioritize activities and decisions that directly contribute to overcoming constraints, even if it means sacrificing efficiency in non-constraint areas. In the context of inventory management, this may involve adjusting inventory policies and practices to support the efficient operation of critical production or distribution processes.

Organizations can detect and resolve obstacles that impede the movement of goods and materials along the supply chain by implementing the TOC principles into inventory management. This could entail putting strategies in place like: Streamlining production processes to shorten lead times and boost throughput; Putting in place inventory control policies that give priority to managing critical inventory items; Enhancing coordination and communication between various supply chain stages to reduce delays and disruptions;putting money into systems and technology that offer real-time visibility into inventory flow and levels.

Overall, the Theory of Constraints offers valuable insights and strategies for optimizing inventory management practices, improving supply chain efficiency, and achieving organizational goals. Organizations can improve their competitiveness and

responsiveness in the fast-paced business world of today by recognizing and resolving inventory flow and level restrictions.

2.1.4 Pareto Theory

Vilfredo Pareto, an Italian economist, originally put forth the Pareto Principle, popularly referred to as the 80/20 rule, in 1896. According to this theory, a tiny fraction of causes (20%) account for a significant proportion of consequences (80%). This idea has been used throughout time in a number of disciplines, such as management, business, and economics. The application of ABC analysis makes the Pareto Principle especially applicable in the field of inventory management. Using this method, inventory items are categorized according to how valuable or important they are to the company. Items are usually categorized into three groups: A, B, and C.

The most important inventory goods are denoted by A goods. Despite making up a minuscule portion of the overall inventory, they have a substantial impact on the overall inventory value or utilization. These A-class products are frequently high-value or high-usage commodities that need strict supervision and close observation to guarantee availability and avoid stockouts. In comparison to A Items, B Items are of a moderate importance. They may contain items of moderate worth or usage and constitute a moderate portion of the overall inventory value or usage. B-class items nevertheless need to be periodically reviewed and managed in order to maintain ideal inventory levels and avoid supply chain interruptions, even though their level of criticality is lower than that of A-class items. The least important inventory items are C items. Despite making up a sizable portion of the overall number of products, their worth or usage in the inventory is comparatively low. Usually low-value or low-usage products, these C-class items can be

controlled with fewer restrictive control mechanisms. To avoid wasting money on needless inventory holding expenses, they nevertheless need to be reviewed on a regular basis for any changes.

Organizations can more efficiently allocate their resources and efforts by classifying inventory items into A, B, and C groups according to their significance or worth. To reduce stockouts and maximize inventory levels, for example, they can put strong inventory management techniques into place, such as demand forecasting, safety stock optimization, and inventory replenishment plans for A-class items. For C-class items, they can implement more lenient control methods in the interim to cut down on administrative costs and steer clear of overinvesting in low-value inventory. Overall, the Pareto Principle in inventory management assists organizations in optimizing resource allocation, improving inventory turnover, and enhancing overall supply chain efficiency by focusing on the critical few items that contribute the most significant impact on inventory value or usage.

2.2 Empirical Literature

A large amount of knowledge regarding inventory management and organizational performance has been gathered as a result of numerous studies looking at different inventory management strategies and performance. According to research by Septabiyya and Sutopo from 2022 on the application of ABC analysis to control inventory and material excesses of the Winston Rattan High back Armchair, one method utilized in inventory planning and management is ABC analysis. The primary objective of the ABC Analysis is to categorize the current inventory according to the overall amount of consumption and investment value of each item. This category is done to help operators

enable the diversification of inventory information and to set control priorities.

The study's result is that the Winston Rattan High Back Armchair inventory moves somewhat becauseeight components, or the majority of the material, are classed as B and used to make the WinstonRattan High Back Armchair. The fewest materials are found in Category A, where there are only two things. Numerous material goods in group C are recognized to have poor investment values thanks to the examination of the investment value. To lower the danger of creating a highrisk of material accumulation and high investment expenses, the acquisition might be scaled downor substituted with other materials.

Paluch (2019) examined the application of the EOQ model to supply chain inventory management based on Bahlsen Polska. The results of the analysis indicate that we should begin our efforts to shorten our supply chain by utilizing the EOQ model. Together with information on order size, which under the current system would aid in capital savings, it presents data in a particular way. It also takes into account the costs related to the inventory.. A company using predictive inventory optimization may adjust its inventory in accordance with the plans of its clients, according Keti's (2020) study on Predictive Inventory Optimization Methods in Proactive Working Capital Management. Proactive working capital management using a predictive inventory optimization plan would save costs and lower the amount of money associated with inventory. Ultimately, it was found that the organization can benefit from additional advantages provided by the recommended predictive inventory optimization technique.

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2.3 Recap of Literature Review and Research Gap

One of the deficiencies of existing research in inventory control systems is the inconsistencies in understanding these systems. The variability and diversity of the author's views on inventory control systems where others view it as the proper inventory management all over the organizationto optimize the movement of stock n and out of the store to maintain a steady supply of raw materials or finished goods this set of inventory management is both philosophical as well as practical orientation thus leaves room for clarity of the research and its applicability in the organization. With inventory control systems,basic underlying idea is to enhance supply chain performance by minimizing wastage, a lot of expenses on holding unnecessary inventory, etc..Thecomplexity of this concept calls upon analysts to advance the concept of inventory control systemsand supply chain performance. The literature review makes it abundantly evident that several studies have been conducted on the effectiveness of general inventory management and the supply chain in public institutions. However, not much research has been done on the connections between Kenya's inventory management systems and supply chain performance. most notably at the Kitui Flour Mills in Mombasa County. The aim of this research was to ascertain the relationship between Mombasa County's supply chain efficiency and the inventory management systems of Kitui Flour Mills.

2.4 Conceptual Framework

A conceptual framework, which is a basic structure composed of certain abstract building components, represents an analytical, experimental, and systematic element of a process or system under investigation (Varpio et al., 2020). The way these components operate together forms the entire framework for the desired outcome. Figure 2.3 on the following page illustrates the conceptual underpinnings of how supply chain performance is impacted by inventory control systems.

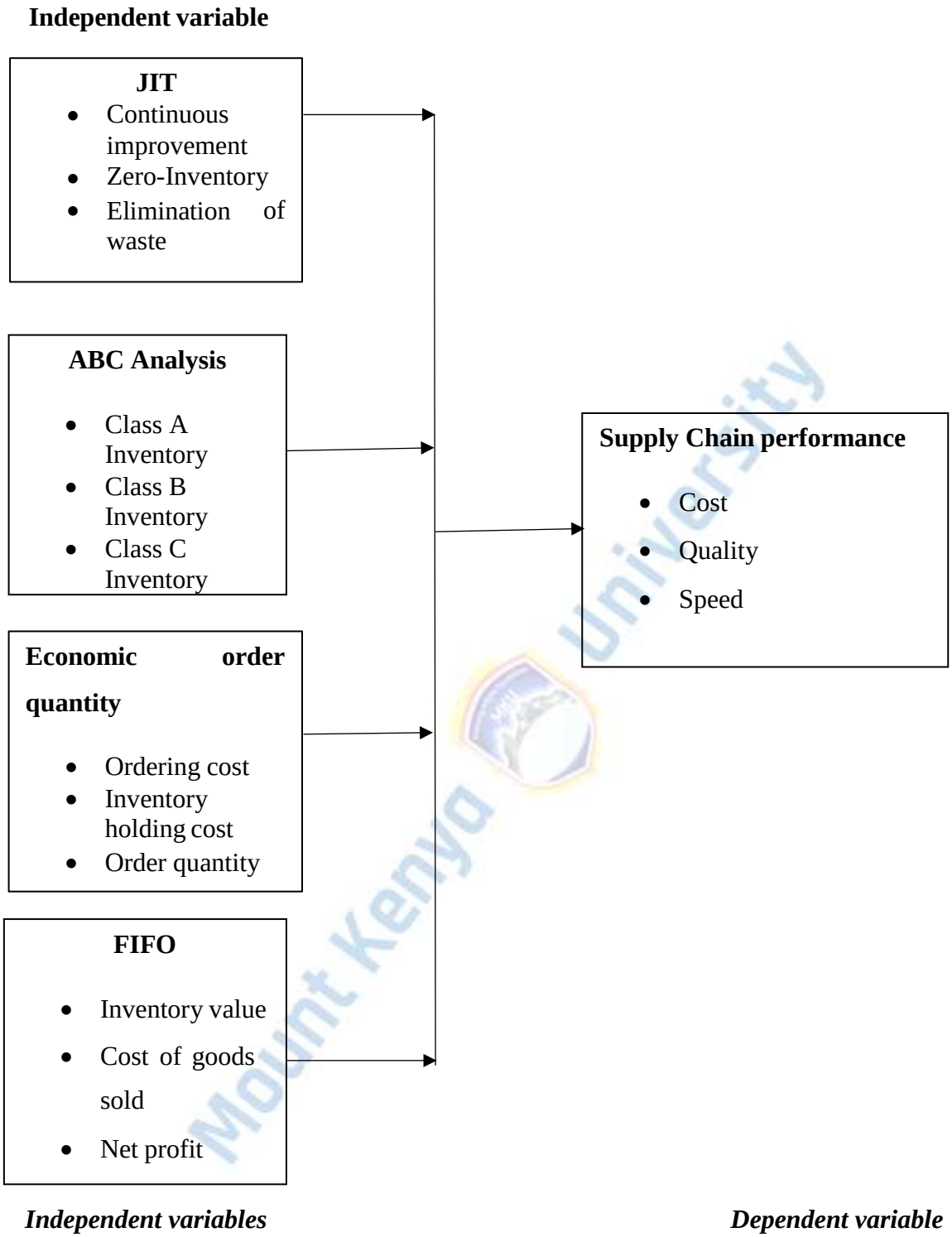

Figure 2.3 Conceptual framework

Source: Researcher, 2024

2.4.1 JIT and Supply chain performance

The Just-in-Time (JIT) lean manufacturing philosophy aims to better align production with customer demand, hence cutting waste and increasing efficiency. This approach emphasizes minimizing inventory levels, which has significant implications for inventory control practices within organizations. Implementing JIT strategies results in reduced inventory holding costs as there is less need for storage space and associated overhead expenses (Macharia & Mukulu, 2016). This reduction in inventory also leads to improved cash flow as capital is freed up from being tied up in stock (Kibisu, 2020). Moreover, JIT encourages a heightened focus on quality control throughout the production process, facilitating the prompt identification and resolution of defects (Esrar, Zolfaghariania, & Yu, 2022).

Another significant implication of JIT for inventory management is the necessity for strong supplier relationships. Since supply chain interruptions can hinder manufacturing, companies must work closely with suppliers to guarantee the timely delivery of components and raw materials (Sebtaoui et al, 2021). Furthermore, while JIT offers numerous benefits, it also introduces risks such as supply chain disruptions or fluctuations in demand. Hence, effective risk management through contingency planning and supplier diversification becomes crucial (Mohamud & Mwangi, 2021). Continuous improvement is integral to the successful implementation of JIT practices. By regularly evaluating and refining processes to eliminate waste and enhance efficiency, organizations can further optimize their inventory control practices and overall operations (Macharia & Mukulu, 2016).

JIT is, all things considered, a powerful approach for businesses looking to improve customer satisfaction, cut expenses, and streamline processes. However, its successful adoption requires meticulous planning, robust supplier relationships, and a commitment to ongoing improvement (Kibisu, 2020). Businesses that employ JIT manufacturing processes make an effort to cut down on all inventorylevels and adhere to customer delivery demands for products and services. This is another way thatJIT usage has helped companies use the JIT manufacturing method more successfully (Mohamud& Mwangi, 2021). The purpose of this essay is to show how advancements in JIT have impacted Iranian manufacturing enterprises' financial results. One of the most significant recent corporate trends is time-based competitiveness, and the JIT mindset is becoming more and more relevant inthe current industrialized era (Macharia & Mukulu, 2016). JIT is a comprehensive organizational strategy that seeks to achieve high-volume production with little inventory at the right time through the planned elimination of all waste and continuous improvement (Kibisu, 2020). A complete organizational strategy called Just-In-Time (JIT) aims to produce large quantities of goods with minimal inventory at the ideal moment. Its main goals are continual improvement and the deliberate removal of all trash (Kibisu, 2020). JIT needs a performance assessment system that assesses changes in quality, setup times, faults, rework, and throughput times in order to reach its aim of excellence through continuous improvement.

JIT manufacturing is an operations management philosophy built on the deliberate removal of allwaste to lower costs and continuously enhancing quality, productivity, and customer happiness. JIT is defined as: Possessing the correct part at precisely the right

time and in the right quantity, to proceed into assembly by Sebtaoui, Adri, Rifai, and Sahaf (2021). Kibisu (2020) defines Just-In-Time (JIT) as the production and delivery of completed goods just in time for sale, subassemblies just in time for final assembly, fabricated components just in time for sub assemblies, and purchased materials just in time for conversion into fabricated parts. JIT is an all-encompassing organizational strategy focused on JIT.

The JIT philosophy has several benefits. According to Esrar, Zolfaghariania, and Yu (2022), JIT has produced a number of advantages, including cheaper production costs, greater and faster throughputs, better product quality, fewer expenses associated with holding inventory, and shorterlead times for purchasing. The following is a list of the primary advantages of JIT: shortened process times, setup times, and lead times; decreased raw material, work-in-progress (WIP), finished goods inventory levels, and lot sizes; improved equipment and decreased machine breakdowns and downtimes; reduced the need for space; improved product flow; decreased production costs; streamlined production processes; improved quality; increased employee motivation, flexibility, and multitasking ability; increased productivity and performance; (Sebtaoui et al, 2021).

2.4.2 Economic Order Quantity and Supply chain performance

A key component of inventory control systems is the Economic Order amount (EOQ) model, which provides an organized method for figuring out the ideal order amount for inventory products inside a company. In order to minimize overall inventory costs while guaranteeing enough stock levels to satisfy demand, EOQ aims to achieve a balance between the costs related to storing inventory and those incurred when ordering or replenishing inventory (Paluch, 2019). EOQ is essentially the process of figuring out how

much inventory needs to be ordered in order to keep overall costs as low as possible.

The cost of maintaining inventory (including obsolescence, insurance, and storage expenses) as well as the cost of acquiring or replenishing inventory (including setup, shipping, and order processing fees) are all taken into consideration in this computation (Keti, 2020).

The EOQ model presupposes a constant unit cost, a steady rate of product demand, and immediate inventory replenishment upon reaching zero. EOQ is a useful method for helping firms manage their inventory and minimize expenses associated with it, even though these assumptions might not always accurately reflect real-world situations (Penny, Mpwanya, & Lambert, 2021). The EOQ model usually requires multiple stages to implement. Organizations must first collect pertinent data, such as the product's annual demand, cost per unit, and ordering or setup expenses. Next, using these inputs, organizations can calculate the EOQ using the formula:

$$EOQ = \sqrt{\frac{2DS}{H}}$$

Where:

D represents the annual demand for the product.

S represents the ordering or setup cost per order.

H represents the holding or carrying cost per unit per year.

Organizations can optimize inventory levels and reduce related costs by making educated decisions about order amounts and reorder points after EOQ is established (Paluch, 2019). To further improve supply chain performance and efficiency, the EOQ model can also be included into more comprehensive inventory management strategies, such as vendor-managed inventory (VMI) or just-in-time (JIT) inventory management. Organizations

can increase overall supply chain responsiveness, decrease stockouts, and increase inventory turnover rates by precisely calculating the ideal order quantities (Keti, 2020). The performance of the supply chain and EOQ have a complex relationship that is essential to the success of a firm. Cost optimization is one important way that EOQ affects supply chain performance. Organizations can reduce overall inventory costs and increase the overall cost effectiveness of their supply chain by precisely estimating the EOQ. This optimization is crucial for organizations aiming to remain competitive in today's dynamic business environment (Keti, 2020).

Furthermore, by guaranteeing that businesses keep the right amount of inventory on hand, EOQ is essential to inventory management. The ideal order quantity (EOQ) is determined by avoiding excess inventory, which can tie up capital and result in higher holding costs, and minimizing the risk of stockouts. Customer service standards and an organization's ability to adjust to changes in demand are directly impacted by this component of EOQ (Penny, Mpwanya, & Lambert, 2021). Moreover, EOQ factors frequently affect the interactions that companies have with their suppliers. Organizations can negotiate better conditions with suppliers, including discounts for greater order quantities or shortened lead times, by placing orders in appropriate numbers. Increased supply chain resilience and dependability may result from these improved supplier relationships (Paluch, 2019).

In addition, EOQ impacts production planning and scheduling for manufacturing organizations. By aligning production quantities with optimal order quantities, organizations can minimize idle time, improve resource utilization, and enhance overall

production efficiency. This integration of EOQ into production processes ensures smoother operations and better utilization of organizational resources (Keti, 2020). Furthermore, EOQ helps in risk reduction by mitigating various supply chain risks. By avoiding excess inventory, organizations reduce the risk of obsolescence and holding costs. Similarly, by minimizing stockouts through optimal ordering, they mitigate the risk of lost sales and potential damage to customer relationships. This risk mitigation aspect is crucial for maintaining supply chain resilience and adaptability (Penny, Mpwanya, & Lambert, 2021).

The Economic Order Quantity model, which controls the timing of orders, stands out among the different models that enable successful material inventory management. It is based on the Economic Order Quantity Index (EOQ) and buffer stock. The number for which the total cost of the order and keeping inventory will be as low as feasible is known as the Economic Order number(EOQ) (Paluch, 2019). The formula for the economic size of the order illustrates the relationship between the expenses of purchasing the inventory, or the order, and the costs of keeping that inventory. The charges required by the business to maintain inventory in excellent condition are known as maintenance costs. These expenses primarily consist of: increased insurance costs, increased storage costs, increased material costs from handling inventory, costs from aging and depreciation of supplies, and increased storage costs. The costs of lost benefits from investing in inventories are usually assumed to be at the same rate as interest on bonds or bank savings accounts (Paluch, 2019).

For example, salaries given to warehouse workers are often useless when discussing maintenancecosts, according to Paluch (2019). Only expenses that vary as a result of

changes in inventory levels should be included.Order costs are the sum of all expenses incurred in connection with placing an order, receiving deliveries, and making any necessary payments. All inventory choicesinvolve procurement costs, which are not decision costs and are not important factors to take into account. The only relevant expenses are incremental order costs.

It might be challenging to accurately measure the cost of creating inventories. It is never "free," even if it doesn't need to be protected in unique ways or stored in rooms that have been specially allocated for that purpose. The least expensive method of maintaining them is to freeze capital ininventory, which in the worst case may result in interest being earned on a bank savings account.Trade credit, for instance, has a low cost of capital but inventory backed with equity has a high cost of capital (Keti, 2020). The rotating and security (buffer) types of inventory are the foundation of the EOQ concept. The initial stock is depleted during routine production; its depletion serves asa cue to contact the supplier and place an order for the quantity indicated by the model under discussion. But up till delivery, the safety margin is used (Penny, Mpwanya, & Lambert, 2021).

2.4.3 FIFO and Supply chain performance

A popular inventory control technique called First-In, First-Out (FIFO) makes sure that products are sold or used in the order that they were received by applying the idea of using the oldest inventory items first. FIFO is especially well-liked in sectors like food, medicines, and electronics where there is a risk of product obsolescence or expiration (Yadav, Bansal, Shivani, & Vanaja, 2020). Fundamentally, FIFO makes sure that the value of ending inventory and the cost of goods sold (COGS) accurately reflect the most

recent expenses made by the company. Regardless of the real physical flow of products, this strategy presupposes that the first things created or bought are also the first ones sold or utilized. This approach, known as FIFO, allows organizations to track inventory costs correctly. By adhering to this principle, FIFO enables businesses to accurately track inventory costs and maintain financial transparency (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019).

When FIFO is implemented, inventory items are usually assigned sequential numbers or codes as they are received, making it simple to identify the oldest things in stock. In order to guarantee that the inventory value appropriately reflects the current market pricing, products are recorded when they are sold or utilized based on the cost of the oldest items accessible (Ching, & Wu, 2019). FIFO is a system of inventory control that has various benefits. First of all, it is consistent with International Financial Reporting Standards (IFRS) and generally accepted accounting principles (GAAP), which simplifies and increases transparency in financial reporting and inventory value. Second, because FIFO allocates higher costs to ending inventory and lower costs to COGS, it tends to reduce taxable gains during periods of rising prices, which in turn results in lower taxable income (Yadav, Bansal, Shivani, & Vanaja, 2020).

Moreover, FIFO provides a more accurate reflection of inventory value and profitability, especially in industries with rapidly changing prices or product lifecycles. FIFO makes it possible to make more informed decisions about pricing, purchasing, and production planning by guaranteeing that the cost of items supplied accurately represents the most recent costs paid by the company (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019).

But FIFO has its drawbacks as well. FIFO may lead to greater COGS and lower ending inventory values during price declines, which could ultimately result in poorer profitability and increased tax obligations. Furthermore, in order to maintain compliance with regulatory regulations and accounting standards, FIFO necessitates proper inventory transaction tracking and recording (Ching & Wu, 2019).

Inventory management is crucial for any business that relies on selling things. For inventory valuation, organizations typically employ the LIFO and FIFO techniques (Last in First Out and First in First Out, respectively). Each of these systems has a large effect on taxes, income, logistics,and profitability (Yadav, Bansal, Shivani, & Vanaja, 2020). The general rule of thumb for firms isthat inventories are valued according to the presumption that the first products purchased for resalewere also the first items sold. Given that some firms have both new and old products in stock, thismay not always be the case. Because of the potential for economic fluctuations and the chance that the cost of producing goods might rise over time, FIFO-using businesses are generally regarded to be more lucrative. As a result, older goods are sold first before they go out of date. FIFO improves net income but also gives us a better picture of the value of ending inventory on the balance sheet since it uses inventorythat may be many years old to compute cost of goods sold, claim Sembiring, Tampubolon, Sitanggang, & Turnip (2019).

Because FIFO leads in a lower recorded cost per unit, it also records a greater level of pretax earnings, making it an excellent technique of valuation for companies trying to impress their suppliers—until the larger profit liability is taken into account. Moreover, organizations may alsosee higher earnings as a result of higher profitability (Ching, &

Wu, 2019). Instead than using theprice paid for the inventory that is already in stock, this technique of inventory counts the cost of sold products using the current price. If the cost of goods sold for these items risen since the original purchase, earnings and tax obligations would be decreased. Due to the possibility that the residual inventory is extremely dated and maybe obsolete, this is not a reliable indicator of endinginventory value.

First-In, First-Out (FIFO) has a substantial impact on supply chain performance in addition to being an inventory control method. In order to guarantee that goods are sold or used in the order in which they were received, FIFO works on the basis of using the oldest inventory items first. This approach is especially important in sectors like food, pharmaceuticals, and electronics where there is a concern about product obsolescence or expiration (Yadav, Bansal, Shivani, & Vanaja, 2020). By guaranteeing that older inventory items are used first, FIFO aids in the efficient management of inventory levels. This minimizes the cost of carrying inventory and lowers the danger of holding out-of-date or expired items. Organizations can increase cash flow and operational efficiency by keeping optimal inventory levels (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019). FIFO contributes to improved customer service levels by ensuring that products reaching customers are fresh and of high quality. In industries where product freshness is critical, such as the food industry, FIFO helps in minimizing the risk of selling expired or deteriorated goods, thereby enhancing customer satisfaction and loyalty (Ching, & Wu, 2019).

FIFO enhances supply chain transparency by providing a clear and traceable record of inventory transactions. Organizations can easily track the movement of goods from receipt to sale, facilitating better inventory control and compliance with regulatory requirements. This transparency fosters trust and collaboration among supply chain partners, leading to smoother operations and improved performance (Yadav, Bansal, Shivani, & Vanaja, 2020). FIFO has implications for financial reporting and inventory valuation. By using the cost of the oldest inventory items for cost of goods sold (COGS) calculations, FIFO tends to result in lower COGS and higher ending inventory values during periods of rising prices. This can positively impact financial statements, such as income statements and balance sheets, leading to better financial performance and shareholder confidence (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019). FIFO supports operational efficiency by facilitating smoother production planning and scheduling. By ensuring that older inventory items are used first, FIFO minimizes the risk of overproduction and excess inventory. This leads to better resource utilization, reduced waste, and improved overall efficiency throughout the supply chain (Ching, & Wu, 2019).

2.4.4 ABC Analysis and Supply chain performance.

ABC Analysis is an inventory control system that groups inventory products into categories according to their value and significance to the company. It is sometimes referred to as Pareto Analysis or the 80/20 rule. It works on the tenet that most products contribute comparatively less to inventory value or usage, but a small fraction of items usually account for a big amount of it. Organizations can more efficiently allocate resources and prioritize inventory management activities thanks to this categorization (Khanorkar & Kane, 2023). Inventory elements are categorized by ABC Analysis into three primary categories:High-value products, or Category A, make up a comparatively small portion of inventory items that account for a sizable portion of its worth or utilization. These items are typically high-value products or critical components that require close monitoring and tighter control. Effective management of Category A items is essential for maintaining profitability and meeting customer demand (Nirmala, Kannan, Thanalakshmi, Gnanaraj, & Appadurai, 2022).

Compared to Category A items, items in Category B have a moderate value or usage. Even while these things are significant to the company, their influence on the performance or total value of the inventory may not be as great. Keeping sufficient stock levels to meet demand, minimizing holding costs, and guaranteeing prompt replenishment are all part of managing Category B products (Yadav, Bansal, Shivani, & Vanaja, 2020). A substantial amount of low-value items make up Category C, which accounts for a comparatively tiny percentage of inventory value or utilization. These products are less essential to the functioning of the company since they are frequently cheap or in low demand. To

eliminate excess inventory, avoid stockouts, and improve overall inventory performance, however, efficient management of Category C items is still crucial (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019).

By concentrating attention and resources on high-value things (Category A) and employing more simplified methods for managing moderate-value (Category B) and low-value (Category C) items, ABC Analysis helps organizations allocate resources more effectively. As a result, businesses can maximize value while minimizing expenses and optimizing inventory management operations (Khanorkar & Kane, 2023). ABC Analysis helps firms optimize inventory levels, minimize stockouts, and increase inventory turnover rates by setting inventory management priorities based on the value and relevance of individual goods. Better cash flow, lower holding costs, and improved supply chain performance as a whole result from this (Nirmala, Kannan, Thanalakshmi, Gnanaraj, & Appadurai, 2022). ABC Analysis can also influence supplier relationships and procurement strategies. Organizations may negotiate favorable terms with suppliers for Category A items, such as volume discounts or preferential lead times, to ensure consistent supply and minimize disruptions. Meanwhile, Category B and C items may be sourced through alternative channels or managed through more flexible agreements (Yadav, Bansal, Shivani, & Vanaja, 2020).

ABC Analysis offers insightful information about demand trends and patterns for many product categories. By doing this, businesses may lower the risk of stockouts and excess inventory, enhance inventory planning, and create demand projections that are more

accurate. Organizations can improve customer satisfaction and responsiveness by matching inventory levels to variations in demand (Sembiring, Tampubolon, Sitanggang, & Turnip, 2019). The annual consumption and value of the items are the foundation of this inventory control method.Finding the consumption cost is made easier by figuring out how much inventory is consumed annually and multiplying that number by the unit cost. The components are then ordered in descending order using the analysis's output, the consumption cost (Khanorkar,& Kane, 2023). An items: class A items are items that are always under tight control. These items are also of highvalue. Their control is exercised at the high level of authority.

Even though they constitute the smallest percentage of the inventory, their percentage annual consumption value is the highest. B items: class B items are under moderate control, these items have got moderate value. Their control is exercised by middle level managers (Nirmala, Kannan, Thanalakshmi, Gnanaraj, & Appadurai, 2022). They constitute a moderate percentage of the inventory. Their percentage annual consumption value, is also moderate. C items: class C items are items of no value even though they constitute the largest percentage of the inventory, their percentage annual consumption value is the lowest. Their control is exercised at the root level of authority. These analysis manages to control inventory by comparing the cumulative number of items and cumulative consumption cost value. Most organizations prefer to use these technique due to its accuracy and effectiveness (Khanorkar,& Kane, 2023).

2.4.5 Supply chain performance

Getting the right goods to the right place at the right time and for the lowest price is a straightforward definition of supply chain performance. Suppliers who create the systems and processes to achieve that performance target are more highly appreciated and are regarded as premium network partners (Lysons & Farrington, 2020). Determining supply chain performance appears to be required in order to evaluate what steps should be taken to ensure service delivery. A reliable and effective supply chain consists of products that are of the required quality, quantity, location, timing, and cost (Kibisu, 2020). Both quantitative and qualitative perspectives on supplychain performance are possible.

Customers expect consistent on-time delivery from their suppliers for both goods and services in the cutthroat business environment of today. In the short term, supply chains are disrupted by delivery anomalies, particularly late deliveries Mbugi & Lutego, 2022). Lead times have a significant impact on how well supply chain partners coordinate. As a result, lead-time reduction can be seen as a supply chain facilitator for coordination. Lead-time reduction has been considereda financial tactic (Lysons and Farrington, 2020).

Improvement of supply chain performance is a constant process, according to study by Alice, Mbugi and Lutego (2022), and it calls for both an analytical performance monitoring system. In order to meet key performance indicators, it also needs a mechanism to launch actions. By linking planning and execution and implementing performance goal realization methods into everyday tasks, Mbugi and Lutego (2022) further define "key performance indicator accomplishment" as this capacity. The impact of logistic supply networks on system revenues and costs is captured bya variety of specified metrics used to evaluate the supply chain. These variables, which are the result

of supply chain management strategies, are regarded as supply chain performance drivers.Through ongoing planning, monitoring, and execution, managers must recognize them andcontinually improve them (Njoki, Ismail, & Osoro, 2021).

Quality, time, cost, and adaptation are the four supply chain performance indicator subcategories.Additionally, they have been divided into categories like as supply chain practices, quality and quantity, cost and non-cost, and tactical, operational, and strategic emphasis (Lysons & Farrington,2020). The lack of systemic thinking, a balanced approach, and strategic alignment persist in manymeasurement systems. Managers have difficulties while trying to carefully choose the appropriateindications. The performance of the supply chain has been evaluated using the balanced scorecard and activity-based costing approaches to address this problem.

2.5 Chapter Summary

This chapter delves into the connection between inventory control systems and supply chain performance. Effective inventory control systems are crucial for ensuring that companies can deliver the right products to the right place, at the right time, and at the right cost. Various inventory control theories and models, and their impact on supply chain performance, are discussed. These include the Resource-Based View (RBV) theory, the Economic Order Quantity (EOQ) model, and the Theory of Constraints (TOC). The Resource-Based View (RBV) theory posits that a company's internal resources and capabilities are the foundation of its competitive advantage. Inventory control and management practices are key resources that contribute to value creation. RBV emphasizes the importance of not just having resources but also effectively leveraging them. It highlights the significance of supplier selection, assessment, and development in enhancing supply chain core competencies by

supporting these internal resources.

The Economic Order Quantity (EOQ) model is a widely used tool for inventory management, helping businesses determine the optimal order quantity that minimizes total inventory costs. The model balances ordering costs, which decrease with larger orders, against holding costs, which increase with larger inventory levels. By identifying the quantity where these costs are balanced, the EOQ model aids in maintaining efficient inventory levels and avoiding stockouts or excessive storage costs. The Theory of Constraints (TOC) is a management philosophy that focuses on identifying and eliminating bottlenecks in a system. In supply chains, constraints might include limited production capacity, raw material shortages, or inefficient logistics processes. By addressing these constraints, TOC aims to improve overall supply chain performance, shifting management efforts from optimizing individual resources to maximizing the throughput of the entire system. This leads to benefits like increased profitability, faster deliveries, and reduced inventory levels.

In the intricate realm of supply chains, optimal performance hinges on efficient inventory control methods. This chapter explores how various techniques influence a company's ability to deliver products effectively. One notable strategy is Just-in-Time (JIT) manufacturing, which aims to eliminate waste and produce goods based on immediate customer demand. This approach leads to a leaner supply chain, reducing holding costs and improving product quality through the use of fresher materials and streamlined production processes. It also results in faster deliveries, as goods are produced to meet current needs, thereby reducing

lead times and enhancing customer satisfaction. Another significant method impacting supply chain performance is the Economic Order Quantity (EOQ) model. This tool helps businesses determine the ideal order quantity to minimize total inventory costs by balancing ordering costs and holding costs. Implementing the EOQ model helps companies avoid production disruptions due to stockouts and unnecessary storage expenses from excessive inventory.

Inventory valuation methods are also crucial. The First-In, First-Out (FIFO) approach assumes that the first items purchased are the first ones sold, which can be advantageous during periods of rising costs, as it can result in higher reported profits by using older, lower costs for goods sold. However, it may not reflect the current value of remaining inventory, which might consist of more recently purchased, higher-cost items. ABC classification provides another approach to inventory valuation by categorizing items based on their annual consumption value. Class A items, representing the highest value, are closely monitored and controlled, while Class C items, with lower consumption value, receive less stringent control. This method enables companies to prioritize resources for high-value items while streamlining management of low-value ones.

Ultimately, supply chain performance depends on delivering the right products at the right place, time, and cost. Key metrics for measuring this performance include delivery time, lead time, and inventory levels. Effective management involves continuous monitoring of these metrics, analyzing data, and implementing corrective actions to maintain a smooth-running supply chain that meets customer demands and enhances overall business efficiency.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The research design, target population, sample and sampling plan, data collection techniques, dataprocessing, and data presentation are more fully covered in this chapter. Furthermore mentioned are the pilot study, validity, and dependability of the research tools..

3.1 Research design

According to Kassu (2019), a research design serves as a strategic framework for conducting an inquiry to address specific research questions and manage deviations. In this study, a descriptive research design was chosen to enable the generalization of research findings to a broader population. Descriptive research, as defined by Bryman (2016), involves collecting data from a representative sample of individuals using tools such as open and closed-ended questions. The primary aim of descriptive research is to provide precise and reliable representations of behaviors or variables relevant to the research question (Hennink, Hutter, & Bailey, 2020). This design facilitates the collection of quantitative data, which can then be analyzed using both descriptive and inferential statistical methods to yield useful insights. Moreover, the descriptive survey design enables researchers to gather reliable data, offering a clear understanding of the phenomenon under investigation. It provides an accurate portrayal of the characteristics of a single person, event, or community in real-life contexts (Creswell & Creswell, 2017). Additionally, a case study gives a researcher the flexibility to use one or more of the

several research methodologies depending on the circumstance (Hennink, Hutter, & Bailey, 2020). Because they provide a thorough understanding of the phenomena and are best suited for examining causal relationships and the processes by which events occur, case studies are the perfect tool for this research.

3.2 Target population

A population is a full set of individuals, objects, or events that all exhibit the same observable characteristic (Rahi, 2017). The term "population" is also used to describe the larger group from which a sample is taken. The study's target population comprised 200 respondents from the finance, procurement, information technology,logistics, operations, and stores departments of the Kitui Flour Mills Mombasa branch. Since inventory control has an indirect or direct impact on variousareas and all corporate operations.

3.3 Sample Techniques and Sampling size

Sampling is defined by Bell, Bryman, and Harley (2018) as a procedure, strategy, or approach used to choose a subset of the population to participate in the study. It is the process of selecting research participants in a way that guarantees the individuals selected appropriately represent the larger group from which they were drawn. A sample, according to Kassu (2019), is a more limited group or subgroup selected from the population that is accessible. Statistics will be generated from the samples in order to make inferences about the population from the sample.

The demographic representing the workers of Kitui Flour Mills' Mombasa branch was used to choose the sample. The stratified random sampling approach was used in the investigation. Compared to simple random sampling, stratified random sampling can be more

efficient. By focusing the sampling effort on specific subgroups of interest, researchers can obtain more precise estimates for the same sample size or achieve similar precision with a smaller sample size. Stratified random sampling provides a clear framework for selecting samples that is based on statistical principles. This enhances the credibility and rigor of the research findings, as the sampling method is transparent and grounded in established methodologies. This approach includes dividing the population into groups based on shared traits through a process called stratification. The next step is the random selection of subjects from each group. This technique, which falls under the category of probability sampling, demonstrates that each person in the population has a fair chance of being chosen. Because it assures statistical effectiveness and gives information to evaluate subgroups, stratified random sampling was used.

3.4 Sample size determination

The exact sample size for the study was determined using Yamane's (1967) sample size calculation with a 95% confidence level and a 5% precision or inaccuracy. The Yamane formula was employed because of its ease of use, scientific accuracy, and broad application.

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

Where

n = Sample size,

N = Population size

e = the level of precision desired

$$\frac{200}{1 + 200(0.05)(0.05)} = 133.3333$$

n = 133 respondents (approx.)

The sample size computed from Yamane formula comprised of 133 respondents to be selected from the firm sampled. This sample size was regarded as representative, thorough in covering the study goals, and cost- and time-efficient.

3.5 Construction of Research Instruments

Data collection, according to Muhaise et al. (2020), is the process of gathering information from the sample. Research instruments are the devices used in a study to gather data (Kassu, 2019). There was use of both primary and secondary data. An inquiry form was used to collect primary data. Both structured and unstructured questions about inventory control techniques were included in the questionnaire. Unstructured questions gave respondents the opportunity to express their ideas in a more pragmatic manner, whereas structured questions were used to restrict the replies to specific topics in which the researcher is interested (Silverman, 2020). Secondary data was gathered by the researcher from pre-existing sources such as books, the internet, previous studies, newspapers, magazines, and CIPS publications.

3.6 Piloting of Research Instruments

Muhaise et al. (2020) claim that a pilot study is required to ascertain the reliability and validity ofthe research instrument. This assists in identifying any questionnaire flaws, and the knowledge gathered in this method may be applied to enhance the questionnaire. The

Mombasa Maize Millers,Mombasa Branch was used as the study's pilot site, but the participating workers were not among the study's final responders.

3.6.1 Reliability of the research instruments

Reliability refers to a study tool's capacity to deliver consistent results throughout several trials (Muhaise, Ejiri, Muwanga-Zake, & Kareyo, 2020). Reliability is a measure of how much trust maybe put in the outcomes of a data-gathering instrument or process, according to Muhaise et al. (2020). It also has to do with the consistency, reliability, and quality of the data (Muhaise et al., 2020). The researcher utilized questionnaires to collect information. Cronbach's alpha was used to evaluate the validity of the research technique. Since alpha is the ratio of two variances, itspotential value ranges from zero to one. However, estimations of alpha can have any value less than or equal to one, even negative values, depending on the estimating method employed, even ifonly positive values make sense. More preferable are alpha values that are higher. The same group of respondents were given the questionnaire twice, separated by two weeks (Muhaise et al., 2020).

3.6.2 Validity of the research instruments

The questionnaire's validity was evaluated using the construct validity method. According to Bryman and Bell (2015), a measure's construct validity is how well it confirms predictedcorrelations with other theoretical prepositions; as a result, construct validity is how well test results can be explained by the explanatory constructs of a reliable theory. In order to evaluate theconstruct validity, we relate a number of extra prepositions to the results obtained by using a measuring method.

If measurements on our created scale reveal the predicted link with these other prepositions, we can infer construct validity. A panel of professionals with knowledge of

the build in the fields of logistics and procurement assisted in evaluating the construct's authenticity. The experts determined if the questionnaires were successful in establishing a link between the variables underinquiry (Bryman & Bell, 2015).

3.7 Data Collection Methods and Procedure

A self-administered questionnaire was used to gather data, and a research assistant was engaged. After three weeks, the questionnaire were collected. The surveys were distributed using a drop and pick technique. In order to remind the respondents to complete the surveys, the researcher visited them again.

3.8 Data Analysis and Presentation

The collected data was coded, subjected to analysis, and descriptive editing. The data analysis employed many descriptive and inferential statistics metrics, including percentages, the mean, the standard deviation, and multiple linear regression. The data were examined using the statistical software for social science (SPSS). A frequency distribution table, bar charts, and pie charts were utilized to display the data in order to make the results easier to understand. Supply chain performance was regressed against five variables namely (JIT, ABC analysis, EOQ and FIFO). The equation is expressed as follows:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + + \beta_4 X_4 + e.$

Where,

Y = Supply chain performance

α = constant (coefficient of

intercept)

X_1 = JIT

X_2 =ABC analysis

X_3 = EOQ

X_4 = FIFO

e = error term

B_1… B_5 = regression coefficient of five variables.

3.9 Ethical Considerations

According to Leedy and Ormrod (2005), researchers have an ethical obligation to disclose to research participants the nature of the study or studies in which they are asked to engage. The key ethical concerns of the study are informed consent, anonymity, privacy, and secrecy. Mt. Kenya University provided the researcher with a letter of introduction identifying her as a student at the university and having been granted permission by the institution to study the sampled company in accordance with ethical standards. After Mount Kenya University completed an ethical review, an ERC letter was issued. The researcher submitted an application for authorization and approval to NACOSTI prior to starting the study. The ethical concerns surrounding this study were explained to the participants. Additionally, consent was communicated in a manner that the responder can comprehend. A copy of the informed consent booklet was supplied to the respondent and preserved for record-keeping, and the informed consent forms was attached to the questionnaire. The study respected the privacy and identity of every participant. All personal data was encrypted, and the information collected was kept confidential. Additionally, each respondent explicitly agreed to participate in the study on a voluntary

basis. The study was approved by local authorities, such as the county administration, in the region.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the data findings on how the study variables (Just In Time (JIT), ABC Analysis, Economic Order Quantity (EOQ), and First In, First Out (FIFO) systems) affect supply chain performance in manufacturing firms. The purpose of this analysis is to determine the effect of inventory control systems on supply chain performance in Kitui Flour Mills in Mombasa County. After discussing the response rate data, the study's findings on the variables are descriptively analyzed. A discussion of the study's results' linear regression analysis concludes the chapter.

4.2 Response rate

The percentage of completed questionnaires relative to the total number of respondents—which includes both those who did and did not respond—is known as the response rate (Kassu, 2019). The researcher intended to make contact with KITUI FLOUR MILLS' 133 responders. However, as Table 4.1 below demonstrates, only 99 questionnaires were accurately filled out and returned. By reminding respondents to complete and return the questionnaires, the researcher was able to attain a response rate of 74.44% through visits. Muhaise et al. considered this response rate to be satisfactory (2020).

Table 1: Response Rate

Sample size	Received responses	Response rate
133	99	74.44%

4.3 Respondents Background Information

The Respondents Background Information of the study were examined by analysis of the respondent's department and working experience. The results of these findings are presented in Table 2 and Table 3 respectively.

4.3.1 Respondents' Department

The respondents were asked the department where they worked and the results were displayed in Table 2 below.

Table 2: Respondents' Department

Department	Frequencies	Percentage
Administration department	20	15%
Production department	30	23%
Procurement department	43	32%
Finance department	40	30%
Total	**133**	**100%**

According to the results of Table 2: The largest group of respondents (43, representing 32%) belonged to the procurement department. This suggests a good participation level from those directly involved in acquiring materials and managing inventory. The finance department (40 respondents, or 30%) also had a significant representation. Their involvement highlights the importance of understanding the financial implications of supply chain practices. The production department contributed 30 respondents (23%). Their participation provides insights from the perspective of those directly involved in manufacturing or assembling products. The administration department had the fewest respondents (20, or 15%). This might indicate a lower level of direct involvement with supply chain practices in their roles.

4.3.2 Respondents' Working Experience

The respondents were asked how long they have worked for the organization and the results are displayed in Table 2 below.

Table 3: Respondents' Working Experience

Department	Frequencies	Percentage
1-2 years	5	3.76%
3-5 years	41	30.83%
6-10years	43	32.33%
Over 10 years	44	33.08%
Total	**133**	**100%**

According to the study findings in Table 3 the largest group of respondents (44, representing 33.08%) had over 10 years of experience. This signifies a strong presence of seasoned professionals with potentially in-depth knowledge of supply chain practices. The second-largest group (43 respondents, or 32.33%) had 6-10 years of experience. This category likely contributes valuable insights based on their established understanding of supply chain operations. A moderate number of respondents (41, or 30.83%) had 3-5 years of experience. They can provide a perspective from those who are relatively new but have gained some practical knowledge. The smallest group (5 respondents, or 3.76%) had 1-2 years of experience. Their input can offer a fresh perspective on how they perceive the impact of supply chain practices.

4.4 Descriptive Statistics Analysis

Whether a dataset is representative of the full population or merely a sample, descriptive statistics provide succinct summary metrics that distill the core of the dataset. These

metrics—central tendency and variability, for example—help to meaningfully illustrate, clarify, and simplify data. They express variables, frequencies, percentages, means, and standard deviations, making it easier to reduce large amounts of data into a comprehensible and manageable manner..

4.4.1 The effects of JIT on supply chain performance

A scale of 1 to 5 was used in the study to determine the effects of JIT on supply chain performance in Mombasa County's Kitui Flour Mills: 1 for strongly disagree, 2 for disagree, 3 for moderately agree, 4 for agree, and 5 for strongly agree. The survey responses about Just-in-Time (JIT) inventory methods and their perceived effects on supply chain performance are summarized in the table (Table 4) that is displayed. According to the statistics, effective supply chain management and the application of JIT principles are positively correlated..

Table 4: Descriptive statistics on the effects of JIT on supply chain performance.

JIT	Strongly Disagree	Disagree	Neutral	agree	Strongly agree	Mean
The firm uses JIT to determine inventory level	0%	0%	27.6%	34.5%	37.9%	4.20
The firm reviews inventory levels before order placement	0.1%	7.1%	10.1%	58.6%	24.1%	4.10
The firm determines appropriate maximum and minimum inventory levels	0%	0%	0%	72.4%	27.6%	4.38
The firm determines the availability of adequate stock at all times.	0.1%	1%	9.2%	27.6%	62.1%	4.62

The study findings indicate a high extent of agreement on utilizing JIT for inventory control among the respondents. A significant majority (72.4%) of respondents agreed or strongly

agreed that their firm employs JIT to establish inventory levels. This indicates a widespread adoption of JIT principles for inventory management. On reviewing inventory before placing orders a considerable portion (58.6%) agreed and 24.1% strongly agreed to reviewing inventory before placing orders, a smaller percentage (7.2%) reported a disagreement on using JIT specifically for determining these levels. This might suggest that some firms utilize a hybrid approach, combining elements of JIT with traditional inventory management practices.

A high percentage (72.4%) agreed and 27.6% strongly agreed that their firm establishes appropriate maximum and minimum inventory levels when asked whether the firm determines of appropriate maximum and minimum inventory levels. This aligns with the core JIT principle of maintaining lean inventory while ensuring enough stock to meet demand. On ensuring stock availability the findings indicate the highest level of agreement (62.1% strongly agreed, 27.6% agreed, and a mean of 4.62). This reflects a crucial aspect of successful JIT implementation, where stockouts can disrupt production and negatively impact supply chain performance.

4.4.2 The effects of Economic Order Quantity (EOQ) on supply chain performance

Using a scale of 1 to 5, where 1 represents strongly disagree, 2 is disagree, 3 is moderately agree, 4 is agree, and 5 represents strongly agree, the study aimed to determine the effects of Economic Order Quantity on supply chain performance in Kitui Flour Mills in Mombasa County. Table 5 provides important information about how the Economic Order Quantity (EOQ) model is thought to affect supply chain performance.

Table 5: Descriptive statistics on the effects of Economic Order Quantity (EOQ) on supply chain performance.

ECONOMIC ORDER QUANTITY	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	Mean
We have adopted the EOQ system	0%	0.1%	10.3%	72.4%	17.2%	4.08
Buffer stock is necessary to prevent stock out	0%	0%	6.9%	79.3%	13.8%	4.23
We have reduced the variety in our stocks	0%	0%	20.7%	44.8%	34.5%	4.13
The firm only procures what is required	0.1%	10.3%	10.3%	62.1%	17.2%	3.47

A significant majority (72.4% agreeing and 17.2% strongly agreeing) indicates their company has adopted an EOQ system for inventory management. This suggests that EOQ is a popular approach for determining optimal order quantities. There seems to be a consensus (79.3% agreeing and 13.8% strongly agreeing) that buffer stock is necessary to prevent stockouts. This aligns with the understanding that EOQ might not account for unexpected demand fluctuations, and a safety stock is crucial to avoid stockouts. A considerable portion (79.3% agreeing) believes EOQ has led to a reduction in stock variety.

This is consistent with EOQ's focus on optimizing order quantities for specific items, potentially leading to a streamlining of inventory selection. The data suggests strong agreement (62.1% agreeing and 17.2% strongly agreeing) that firms only procure what is required using EOQ. This reflects a core benefit of EOQ – minimizing unnecessary inventory holding costs by acquiring materials only when needed for production.

4.4.3 The effects of FIFO on supply chain performance

The purpose of the study was to determine the degree to which participants agreed or disagreed with the claims made about the advantages of using FIFO methods. A 5-point Likert scale was employed, with 1 denoting strongly disagree, 2 disagree, 3 moderately agree, 4 agree, and 5 strongly agree. The feedback on the First-In-First-Out (FIFO) inventory management method's perceived effects on supply chain performance is compiled in Table 6. The information points to a favorable correlation between FIFO and a number of performance indicators.

Table 6: Descriptive statistics on the effects of FIFO on supply chain performance.

FIFO	**Strongly disagree (%)**	**Disagree (%)**	**Neutral (%)**	**Agree (%)**	**Strongly agree (%)**	**Mean**
Inventory cost reduction	0%	9.4%	28.7%	49.7%	12.2%	3.59
Wastage reduction	0.8%	9.1%	0.5%	65.5%	24.1%	4.43
Reduced Lead time	0%	4.3%	59.1%	36.6%	0%	3.24
Reduced inventory	10.2%	0%	58.6%	31%	0.2%	3.09
Improved customer satisfaction	0%	7.5%	29.5%	45.1%	17.9%	4.10

A significant majority of respondents agreed or strongly agreed that FIFO contributes to inventory cost reduction (61.9%) and wastage reduction (89.6%). This aligns with the core benefit of FIFO – selling older inventory first, which helps minimize the risk of spoilage, obsolescence, and associated costs. While a neutral response prevailed regarding reduced lead times (59.1%) and reduced inventory (58.6%), there was still a notable agreement (over 30% for each). This suggests FIFO might not directly influence these factors but can be implemented alongside other strategies to optimize them. Nearly two-thirds (63%) of respondents agreed or strongly agreed that FIFO leads to improved customer satisfaction. This can be attributed to FIFO's role in ensuring customers receive fresh, in-date products, reducing the likelihood of receiving expired or damaged goods.

4.4.4 The effects of ABC analysis on supply chain performance

Table 7 below summarizes survey responses on the use of ABC analysis and its impact on inventory control in a firm. A scale of 1-5, where (1- Strongly disagree, 2- Disagree, 3- Moderately agree, 4- Agree and 5- Strongly agree) was used.

Table 7: Descriptive statistics on the effects of ABC analysis on supply chain performance

ABC ANALYSIS	Strongly disagree (%)	Disagree (%)	Moderately agree (%)	Agree (%)	Strongly agree (%)	Mean
The firm uses ABC ANALYSIS to classify inventories	0%	0%	20.7%	65.5%	13.8%	3.93
Inventory Control measures are adequate for most item categories	0%	55.2%	0%	34.5%	10.3%	3.00
Order frequency is acceptable for most item categories.	6.9%	34.5%	31.0%	27.6%	0%	2.79
ABC Analysis improves Inventory turnover rate	0%	6.9%	62.1%	31.0%	0%	3.24
There is improved inventory Classification Accuracy (A, B, C).	0%	10.3%	41.4%	34.5%	24.1%	3.72

A significant majority (65.5% agreeing or strongly agreeing) indicates that the firm utilizes ABC analysis to classify inventories. This suggests that ABC analysis is a well-established practice for inventory management within the firm. Over half of the respondents (55.2% disagreeing) felt that inventory control measures are adequate for most item categories. This could indicate that the current controls, potentially guided by ABC classification, are

reasonably effective in managing inventory levels. There seems to be a mixed perspective on order frequency. While a combined response of 37.9% (moderately agree and strongly agree) suggests acceptable frequency for most categories, a considerable portion (41.4% disagreeing and strongly disagreeing) indicates potential room for improvement. A strong majority (62.1% moderately agreeing and strongly agreeing) believe that ABC analysis has improved inventory turnover rates. This aligns with a core benefit of ABC analysis – prioritizing the ordering of critical (A) items and potentially reducing overall inventory holding costs. The data shows a positive response regarding inventory classification accuracy (75.9% moderately agreeing, agreeing, and strongly agreeing). This suggests that the ABC classification system effectively reflects actual inventory usage patterns within the firm.

4.4.5 Regression analysis

Utilizing a multiple regression analysis, the researcher quantified the relationships between Just-in-Time (JIT), Economic Order Quantity (EOQ), First-In-First-Out (FIFO), and ABC Analysis on overall supply chain performance. The results revealed significant positive relationships between all four inventory control systems and supply chain performance. This aligns with existing literature that emphasizes the potential benefits of these systems. The analysis of variance (ANOVA) plays a crucial role in assessing the overall significance of the regression model used to explore the relationship between (JIT, ABC Analysis, EOQ, FIFO) and supply chain performance.

The regression model's summary statistics in Table 8 below provide valuable insights into the model's overall fit and explanatory power. R (coefficient of determination) value ranging from 0 to 1 represents the proportion of variance in the dependent variable (supply chain

performance) explained by the independent variables (JIT, ABC Analysis, EOQ, FIFO) included in the model. A higher R-squared value indicates a better fit, suggesting the model explains a larger portion of the observed variation.

The R-squared (0.601) value indicates that the model explains 60.1% of the variance in supply chain performance across the sample organizations. While not exceptionally high, it suggests a moderately strong positive relationship between the chosen supply chain practices (JIT, ABC Analysis, EOQ, FIFO) and the performance metric used. The remaining 40% of the variance could be attributed to other uncaptured factors like product type, demand variability, or supplier performance.

Table 8: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.775[a]	.601	.995	.005

The ANOVA results in this study revealed a statistically significant F-statistic (3.897) at a confidence level of $\alpha = 0.05$. This indicates that the model, as a whole, explains a significant portion of the variance in supply chain performance observed across the sample organization. In simpler terms, the F-statistic suggests that the combined effect of the independent variables (JIT, ABC, EOQ, FIFO) on the dependent variable (performance metric) is statistically different from zero. This implies that at least one of the independent variables has a significant impact on supply chain performance.

Table 9: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	22.457	4	2.910	3.897	.005[b]
Residual	92.086	133	.608		
Total	114.543	137			

However, the ANOVA itself doesn't pinpoint which specific practices hold the most significant influence. To delve deeper into the individual contributions of each practice, we need to analyze the individual regression coefficients and their corresponding p-values, as discussed in the following section.

Table 10: Coefficients of Overall Regression Model

Model	B Coefficients	Std. Error	t	Sig.
Constant	.153	.361		.018
Just-in-Time	.539	.117	2.792	.000
Economic Order Quantity	.469	.005	5.249	.000
First-In-First-Out	.281	.065	2.854	.003
ABC Analysis	.159	.120	2.333	.008

Study findings from Table 10 above indicate that the expected performance when all independent variables are zero is 0.153 represented by the value of Constant from the regression model. Just-in-Time (JIT) B coefficient (0.539) indicates a positive relationship between JIT implementation and supply chain performance. A higher JIT score signifies a

stronger implementation, which is associated with an increase in the predicted performance metric. Significance (p-value = 0.018) is typically below 0.05 suggesting that the observed relationship between JIT and performance is unlikely due to chance.

Economic Order Quantity (EOQ): B coefficient (0.469): Similar to JIT, the positive coefficient suggests a positive association between EOQ implementation and performance. Higher EOQ implementation scores are linked to improved performance.

First-In-First-Out (FIFO): B coefficient (0.281): The positive coefficient indicates a positive relationship between FIFO implementation and performance. Stronger adherence to FIFO principles is associated with better performance outcomes. Significance (p-value = 0.003): This statistically significant p-value supports the notion that FIFO implementation contributes positively to supply chain performance.

ABC Analysis: B coefficient (0.159): The positive coefficient suggests a positive association between a strong ABC analysis score (better focus on A-items) and performance. Significance (p-value = 0.008): This statistically significant p-value indicates that the observed relationship between ABC analysis and performance is unlikely due to chance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter includes a summary of the research findings, inferences drawn from the study's objectives, study recommendations, and ideas for additional research.

5.2 Summary of Research Findings

The impact of four inventory control systems on the overall performance of the supply chain was examined in this study: Just-in-Time (JIT), ABC Analysis, Economic Order Quantity (EOQ), and First-In-First-Out (FIFO).

5.2.1 Summary of Descriptive Statistics Analysis Findings

Just-in-Time (JIT): Survey responses on Just-in-Time (JIT) Adoption revealed a strong emphasis on JIT principles within the firm. The majority of respondents (65.5%) agreed that the firm utilizes JIT practices for inventory control. The mean score of 3.93 suggests a positive overall perception of JIT adoption within the firm. A B coefficient of (0.539) indicates JIT has the highest positive relationship between JIT implementation and supply chain performance

Economic Order Quantity (EOQ): The survey explored the use of EOQ for determining optimal order quantities. After JIT, EOQ had the second-highest positive coefficient (0.469) suggesting a positive association between EOQ implementation and performance. Higher EOQ implementation scores are linked to improved performance.

First-In-First-Out (FIFO): B coefficient (0.281): The positive coefficient indicates a positive relationship between FIFO implementation and performance. The survey findings provide positive indications regarding the potential benefits of implementing a FIFO system. The reported reductions in inventory costs, wastage, and lead times, along with improvements in customer satisfaction, suggest that FIFO can contribute to a more efficient and customer-centric supply chai

ABC Analysis: The survey investigated the use and perceived effectiveness of ABC classification for inventory management. The mean score for various aspects of ABC analysis implementation ranged from 3.00 to 3.72, highlighting its perceived effectiveness in inventory management. While a majority agreed on ABC analysis implementation, a significant portion felt there was room for improvement, potentially indicating a need to refine controls based on ABC classifications.

5.2.2 Summary of Multiple regression analysis findings

The study investigated the associations between these study variables and a selected supply chain performance metric (cost savings, quality, and time) using a multiple regression analysis. A reasonably strong positive link (R-squared = 0.601) between the independent and dependent variables was found in the summary of the regression model. The model's generalizability was demonstrated by the adjusted R-squared of 0.595, and its high prediction accuracy was revealed by the low standard error of the estimate (0.005).

Further analysis of the individual regression coefficients provided deeper insights. All four inventory control systems displayed statistically significant positive relationships with performance (p-value < 0.05). This suggests that implementing each practice (JIT, EOQ,

FIFO, ABC Analysis) can contribute to improvements in the chosen performance metric. Table 8's examination of the individual regression coefficients provides insight into the precise impact of every supply chain behavior on performance. Positive B coefficients are found for each of the four independent variables (JIT: 0.539, EOQ: 0.469, FIFO: 0.281, ABC Analysis: 0.159). This suggests that there is a positive correlation between the expected performance and each inventory control system implementation score. To put it another way, a higher score (stronger implementation of each inventory control system) corresponds to a higher predicted performance value. All of the practices' p-values (JIT: 0.018, EOQ: 0.000, FIFO: 0.003, ABC Analysis: 0.008) are statistically significant. This implies that the observed positive relationships between each practice and performance are unlikely to be due to chance.

5.3 Conclusion

The results of this study lend credence to the idea that supply chain performance may be significantly enhanced by putting important inventory control systems like JIT, EOQ, FIFO, and ABC Analysis into practice. The regression model showed the beneficial effects of these behaviors on a selected performance metric and offered a statistically solid framework for investigating these associations.

By obtaining and storing only the resources required for immediate production, JIT inventory management aims to reduce the expenses associated with keeping inventory on hand. It reduces inventory carrying costs by lowering inventory levels translating to less storage space required and reducing costs associated with holding inventory (warehousing, insurance, etc.). Reduced inventory exposure can minimize the risk of obsolescence or

deterioration of materials, potentially leading to improved product quality. By receiving materials closer to the production time, firms can potentially shorten lead times and enhance responsiveness to changing customer demands.

The findings suggest that EOQ offers several advantages for supply chain management. By optimizing order quantities, EOQ can help minimize storage space requirements and overall inventory carrying costs. Streamlining inventory by focusing on essential items can potentially enhance operational efficiency within the supply chain. Procuring only what's needed can lead to less waste from obsolescence or deterioration of excess inventory. The reliance on buffer stock highlights a potential limitation of EOQ. Inaccurately predicted demand or unexpected surges can still lead to stockouts if buffer stock isn't sufficient.

By prioritizing the sale of older inventory, FIFO helps minimize the risk of perishable items spoiling or products becoming outdated before they are sold. This directly translates to cost savings and less waste. FIFO promotes the sale of older inventory, potentially leading to a higher proportion of fresher products being available for customers. This can enhance customer satisfaction and potentially reduce returns. The effectiveness of FIFO can vary depending on the industry. It might be more critical for businesses dealing with perishable or time-sensitive products. FIFO might require adjustments to inventory management systems to ensure proper tracking and prioritization of older items. These adjustments could incur some initial costs.

Overall, the findings suggest that ABC analysis is being implemented and plays a role in the firm's inventory management practices. There are indications of positive impacts on

inventory turnover and classification accuracy. However, there's also a possibility to improve order frequency for certain item categories.

5.4 Recommendations of the Study

Based on the results, the study recommend that organizations consider implementing these inventory control systems to improve supply chain performance:

- Just-in-Time (JIT): Implementing JIT principles can lead to reduced lead times, lower inventory holding costs, and improved responsiveness to demand fluctuations.
- Economic Order Quantity (EOQ): Optimizing order quantities through EOQ models can minimize total inventory costs while ensuring adequate stock levels.
- First-In-First-Out (FIFO): Adhering to FIFO principles can help reduce wastage and improve inventory accuracy, potentially leading to better inventory turnover.
- ABC Analysis: Focusing on effectively managing A-items (high value, low volume) using ABC analysis can contribute to overall supply chain optimization.

5.5 Suggestions for further study

Future research can address study limitations of focus on one firm by enlarging the target population and sample size. This would enhance the model's generalizability and statistical power. Including a wider range of industries, exploring the impact of these practices across diverse sectors can provide a more comprehensive understanding. Utilizing objective data can enhance incorporating objective measures of implementation (e.g., production scheduling for JIT, reorder point data for EOQ) and can strengthen the analysis. Consider

including multiple flour milling companies from Mombasa County or a wider region in the study. This can provide a more comparative perspective and enhance the generalizability of the findings.

There is need to triangulate data by combining data from internal sources (Kitui Flour Mills) with external data sources (industry reports, government statistics) to gain a more holistic view of inventory control practices and their impact on performance. Explore a Wider Range of Inventory Control Systems: Investigate the effectiveness of additional inventory control methods beyond those initially chosen. This can provide a more comprehensive picture of inventory management strategies within the flour milling industry.

By implementing these recommendations and conducting further research with a broader scope and robust data collection methods, organizations can gain deeper insights into optimizing their supply chains through the strategic implementation of these key practices.

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APPENDICES

APPENDIX I: Letter of Introduction

To Whom It May Concern

Dear Sir/Madam,

RE: COLLECTION OF DATA

I am a student pursuing Master of Science in Procurement and Supplies Management of Mount Kenya University. As part of the requirement for the award of the degree, I am carrying out a research study on "EFFECT OF INVENTORY CONTROL SYSTEMS ON SUPPLY CHAIN PERFORMANCE AT KITUI FLOUR MILLS, MOMBASA COUNTY". In respect to the above requirement, I kindly seek your assistance in filling the questionnaire attached. The attached questionnaire will take about 10 minutes to complete. Kindly answer all questions. Your kind response will be highly appreciated and treated with utmost confidentiality. Any information given will be purely used for academic purpose and will not whatsoever be used for any other purpose than the one intended. Thank you in advance.

Yours sincerely,

SHAURI MUNIRA KHALID
School of Business and Economics,
Mount Kenya University,
P.O BOX 42702-80100,
MOMBASA

APPENDIX II: Informed Consent

EFFECT OF INVENTORY CONTROL SYSTEM ON SUPPLY CHAIN PERFORMANCE AT KITUI FLOUR MILLS, MOMBASA

Dear Participant, I invite you to participate in a research study entitled ***Effects Of Inventory Control System on Supply Chain Performance at Kitui Flour mills, Mombasa County***: I am currently enrolled in the Master of Science Degree in Procurement and Supplies Management at Mount Kenya University and am in the process of writing my Master's project. The purpose of the research is to determine: ***Effects Of Inventory Control Sytem On Supply Chain Performance At Kitui Flour Mills, Mombasa County***. The enclosed questionnaire has been designed to collect information on: ***Effects of Inventory Control System on Supply Chain Performance, Mombasa County.***

Your participation in this research is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. There are no known risks to participation beyond those encountered in everyday life. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. No one other than the researchers will know your individual answers to this questionnaire. There are no direct benefits to you for participating in this research. However, you may find it interesting to talk about the issues addressed in the research and it may be beneficial to the field and to future clients or individuals who have experienced similar concerns.

If you agree to participate in this project, please answer the questions on the questionnaire as best you can. It should take approximately ***25 minutes*** to complete. Please return the questionnaire as soon as possible to enable me complete the project report.

If you have any questions about this project, feel free to contact the INVESTIGATOR, Mrs. Munira Khalid , +254799652625, Email: khalidmunira54@gmail.com or Dr Jackson Ndolo Tel. 0723699889. Email: ndolologistics@gmail.com If you have questions about your rights as a research participant, please be in touch with the Chairman, Mount Kenya University, Ethical Review Committee, P.O Box 342-01000, Thika.

Thank you for your assistance in this important endeavor.

CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature_____ Date _____

APPENDIX III: Questionnaire

INSTRUCTION: *Please answer all the questions honestly and exhaustively by putting a tick (√) or numbers in the appropriate box that closely matches your view or alternatively writing in the spaces provided where necessary.*

NB: **This information was used strictly for academic purposes only and was treated with** utmost confidentiality.

PART A: Background Information

Department……

Job Designation……

PART B: JUST IN TIME (JIT)

1. Please indicate the extent to which you agree or disagree on how following JIT inventorycontrol techniques affects supply chain performance.
   Use a scale of 1-5, where (1- Strongly disagree, 2- Disagree, 3- Moderately agree, 4- Agreeand 5- Strongly agree)

No	**JIT**	**1**	**2**	**3**	**4**	**5**
1	The firm uses JIT to determine inventory level					
2	The firm review inventory levels before order placement					
3	The firm determines of appropriate maximum andminimum inventory levels					
4	Availability of adequate stock at all times.					

PART C: ECONOMIC ORDER QUANTITY

1. Please indicate the extent to you agree or disagree on how the following affect Economicorder quantity as a technique used to control inventory.
   Use a scale of 1-5, where (1- Strongly disagree, 2- Disagree, 3- Moderately agree, 4- Agreeand 5- Strongly agree)

No	EOQ	1	2	3	4	5
1	We have adopted EOQ system					
2	Buffer stock is necessary to prevent stock out					
3	We have reduced variety in our stocks					
4	Firm only procures what is required					

PART D: FIFO

Please indicate the extent to which you agree or disagree with the following benefits accrued as result of adoption of FIFO practices? Use a scale of 1-5, where (1- Strongly disagree, 2- Disagree, 3- Moderately agree, 4- Agree and 5- Strongly agree)

No	Performance indicators	1	2	3	4	5
1	Inventory cost reduction					
2	Wastage reduction					
3	Reduced Lead time					
4	Reduced inventory					
5	Improved customer satisfaction					
6	On time delivery					

PART E:ABC ANALYSIS

1. Please indicate the extent to which you agree or disagree on how ABC Analysis affectsupply chain performance.
   Use a scale of 1-5, where (1- Strongly disagree, 2- Disagree, 3- Moderately agree, 4- Agreeand 5- Strongly agree)

No	ABC ANALYSIS	1	2	3	4	5
1	There is improved inventory Classification Accuracy (A, B, C).					
2	Control measures are adequate for most item categories					
3	Order frequency is acceptable for most item categories.					
4	ABC Analysis improves Inventory turnover rate					

PART F: SUPPLY CHAIN PERFORMANCE

1. These following statements are measurable indicators on the SUPPLY CHAIN Performance. Kindly fill in the required data according to your records.

A		**2024**
A1	Cost savings	
A2	Quality	
A3	Lead time	

Thank You

APPENDIX IV: Post Graduate Introduction Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPSM/2021/84356

20th February, 2024

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

Dear Sir/ Madam,

RE: SHAURI MUNIRA KHALID – REGISTRATION NO. MPSM/2021/84356

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

The title of the research is **"Effects of Inventory Control Systems on Supply Chain Performance at Kitui Flour Mills, Mombasa County."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **February, 2024 and April, 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you

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

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

APPENDIX V: ERC Certificate

Mount Kenya University

REF: **MKU/ISERC/3459** Date: 14 February 2024
TO: **SHAURI MUNIRA KHALID**
REG: **MPSM/2021/84356**

Dear Sir/Madam,

RE: EFFECT OF INVENTORY CONTROL SYSTEMS ON SUPPLY CHAIN PERFORMANCE AT KITUI FLOUR MILLS, MOMBASA COUNTY

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2503.** The approval period is **14/02/2024 - 13/02/2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 01100, Thika

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

APPENDIX VI: Nacosti Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **246338**

Date of Issue: **24/February/2024**

RESEARCH LICENSE

This is to Certify that Ms.. Munira Khalid shauri of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Mombasa on the topic: EFFECT OF INVENTORY CONTROL SYSTEMS ON SUPPLY CHAIN PERFORMANCE AT KITUI FLOUR MILLS, MOMBASA COUNTY for the period ending : 24/February/2025.

License No: **NACOSTI/P/24/33327**

246338

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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See overleaf for conditions

Appendix VII: Field entry authorization

KITUI FLOUR MILLS LTD.

P.O.Box 42160, Mombasa Tel: 2490647, 2490303/4
Fax: +254 41 2490653 Email:info@kituiflourmills.com

26th February,2024

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: LETTER OF AUTHORIZATION FOR DATA COLLECTION

STUDENT: MUNIRA KHALID

This is to confirm that the above mentioned is a student at Mount Kenya University presently undertaking her Master's Degree in Procurement & Supply Chain Management.

As partial requirement for her course she is required to undertake data collection from an established organization for the purpose of investigating the effect of inventory control systems on supply chain performance at Kitui Flour Mills Limited.

This is to confirm that she has been duly authorized to collect data from our organization, strictly for the purpose of her study and that has been duly briefed on our data collection guidelines and agreed to strictly adhere to them.

Please extend your cooperation to facilitate her data collection efforts.

Yours faithfully,

KITUI FLOUR MILLS LIMITED

KITUI FLOUR MILLS LTD.
29 FEB 2024
P. O. Box 42160 - 80100
MOMBASA

EFFECT OF INVENTORY CONTROL SYSTEMS ON SUPPLY CHAIN PERFORMANCE AT KITUI FLOUR MILLS, MOMBASA COUNTY

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