

**EFFECT OF INVENTORY MANAGEMENT PRACTICES ON SUPPLY CHAIN
PERFORMANCE OF COUNTY GOVERNMENTS IN WESTERN REGION,
KENYA**

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**A Research Thesis Submitted in Partial Fulfilment of the Requirements for the
Award of the Degree of Masters of Business Administration (Supply Chain
Option) of Masinde Muliro University of Science and Technology.**

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DEDICATION

This research thesis is dedicated to my family, especially my parents, Zaddock Oboge and Josinter Akinyi Oboge, as well as my brothers, sisters, nephews, nieces, and friends, for their unwavering moral support and encouragement throughout. I am deeply thankful to all of them.

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ABSTRACT

Inventory management is the responsibility of the entire organization and it's very critical to both county and national government growth and success. The focal point of the study was to establish the effect of inventory management practices on supply chain performance of county governments in western region, Kenya. Specific objectives of the study were to evaluate the effect of economic order quantity on supply chain performance, investigate the effect of vendor managed inventory system on supply chain performance, examine effect of just in time on supply chain performance and finally the effect of lean inventory practices on supply chain performance. The study was conducted in the county governments of western region, Kenya which included Kakamega, Busia, Bungoma and Vihiga after having carried out a pilot study in Kisumu County. The study was guided by four theories which included, Economic order model theory, the Network theory, Just –in time theory, and lastly Lean inventory theory. The study adopted descriptive survey research design. Reliability was tested using Cronbach's alpha while validity ensured through content validity. The study employed Census approach where all 120 staffs from, procurement, stores and quality assurance departments were selected using purposive sampling techniques. Data was obtained using structured questionnaires. Descriptive statistics was tested through the use of mean, percentages and standard deviations while inferential statistics tested through the use of simple linear regression, Pearson correlation and multiple regression. Data was presented using tables, charts, and graphs. SPSS version 24 was used to aid in the data analysis. The results of simple linear regression established that economic order quantity had a positive and significant effect on the supply chain performance ($\beta = 0.762$; $p < 0.000$). secondly, vendor managed inventory system was positively and significantly affecting supply chain performance ($\beta = 0.845$; $p < 0.000$). in addition, just –in time was positively and significantly affecting supply chain performance' ($\beta = 0.693$; $p < 0.001$) and lastly, lean inventory practices positively and significantly affect supply chain performance of county governments in western region, Kenya ($\beta = 0.834$; $p < 0.001$). Multiple regression results showed that inventory management practices influences supply chain performance. The study therefore recommends that county governments adopt proactive attitudes towards the issue of proper inventory management practices as well as avoids the dangers that are inherent in keeping too little or too much of stock .The results would provide an input for future academic works to be conducted on counties and other institutions on performance. the study would help the government institutions and other various organizations to highlights inventory management methods that need major emphasis as regarding performance of an organization, it would provide an insight into the inventory management practices attributes that would guide the current and future made policies as well as providing a contemporary cornerstone for implementation of more inventory management practices for improved performance in county governments in western region, Kenya as well as other Counties that faces similar problem of inventory management practices.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA :	Analysis of Variance
CIDP :	County Integrated Development Plan
CPFR :	Collaborative Planning, Forecasting and Replenishment
DV :	Dependent Variables
EOQ :	Economic Order Quantity
IV :	Independent Variables
JIT :	Just-In-Time
KPIS :	Key performance Indicators
NACOSTI:	National Commission for Science Technology and Innovation.
SC :	Supply Chain
SCPM :	Supply Chain Performance
SMES :	Small Medium Enterprises
SPSS :	Statistical Packages for Social Science
VIF :	Variance Factor
VMI :	Vender Managed Inventory

OPERATIONAL DEFINITIONS OF KEY TERMS

Economic Order Quantity (EOQ): This refers to a metric that represents the ideal order size to minimize cost in an institution, companies or businesses. Economic order quantity encompasses the following; Minimization of Buffer Stock, Demand Schedule, and Stock level Management.

Inventory Management Practice: Encompass methods that monitor inventory levels, determine maintenance thresholds, anticipate replenishment needs, and optimize order sizes. These methods include Economic Order Quantity, Vendor Management Inventory systems, Just-In-Time and Lean inventory practices.

Just-In-Time (JIT) Inventory: Stock management approach that firms uses to enhance effectiveness and minimize excess by receiving stock only when need arises, thus, reducing inventory expenses and its key aspects includes, defect reduction, Service optimization and timely deliveries.

Lean inventory practices: This refers to the process of increasing the value of a company's stock by identifying and eliminating any waste when handling materials. It is an approach that focuses on waste management, standardization, and flexible ordering to enhance operational efficiency.

Supply Chain Performance: The capability to deliver the correct product to

the right place at the right time, with minimal logistics costs.

Supply Chain: This refers to a centralized management process for county governments, covering upstream and downstream product flows from source to consume.

Vendor Management Inventory System: This refers to an inbound logistics approach which includes order fulfillment, fostering strong buyer-supplier relationships, and facilitating information sharing between the parties involved.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

According to Waters (2013), inventory management practices involve controlling inventory levels, determining necessary replenishments, and managing order sizes. This management is crucial across different facility locations or within a supply network to ensure uninterrupted production against unexpected disruptions due to material shortages (Williams, 2015).

Inventory management as outlined by Haq and Boddu (2017), encompasses various important factors. These factors include balancing replenishment lead times, managing inventory carrying costs, ensuring efficient asset management, accurate forecasting, proper valuation, enhancing visibility, forecasting pricing, effectively managing physical space, ensuring quality control, streamlining replenishment processes as well as efficiently handling returns and defective goods.

Globally, inventory management has faced challenges such as excessive inventory without adequate management or overly meticulous management resulting in inadequate inventory levels. In America, inventory contributes to almost sixty percent 60% of the annual turnover in the manufacturing firms (Seungjae *et al.*, 2015). This shows clearly that a lot of concern should be given to inventory management to avoid unnecessary costs. Actually, any function of the firm which accounts for well over half of its receipts certainly deserves a great deal of managerial attention.

The business community has recognized and praised the impressive efficiency as well as the effectiveness of Japanese, European, and North American businesses in manufacturing as well as distribution. Recent advancements have seen firms raising standards further by collaborating closely with other entities in their supply chains. Rather than reacting to unpredictable and fluctuating demand, these firms exchange information to mitigate demand variability (Silver, Pyke, & Peterson, 2016).

According to Shin *et al.* (2016), effective stock management is crucial to firms as it ensures uninterrupted operations by maintaining adequate inventory levels. Zare *et al.* (2018) emphasize that proper inventory management enables accurate forecasting of inventory needs, helping firms address uncertainties in demand. Brigham and Gapenski (2013) argue that inventory management is essential for asset and stock management, ensuring accurate demand forecasting to avoid unplanned procurement processes. Dobler (2014) underscores that well- managed inventories contribute significantly to overall profitability and enable smooth functioning of other operational zones for instance production, purchasing and financial management. The primary challenge, however, lies in determining the optimal inventory levels that integrate effectively with the organization's existing operational systems or frameworks.

Song *et al.* (2019) argue that effective inventory management plays a crucial role in enabling organizations to achieve their targeted production or sales revenues, which are critical indicators of performance. Haq and Boddu (2017) highlight the importance of striking a balance between overstocking and understocking through proper inventory management, aiming for optimal inventory levels at all times. They emphasize that maintaining this balance reduces costs associated with holding inventory by 4-10%.

Additionally, Wisner *et al.* (2011) assert that organizations that effectively manage their raw material inventories are more likely to complete production on schedule.

Inventory management strives to achieve a delicate equilibrium between preventing shortages and avoiding excessive inventories. Shortages can lead to reduced sales, disruptions in production, and unmet customer demand. On the other hand, maintaining excessive inventories can escalate holding and storage costs, encompassing expenses for breakage, obsolescence, insurance, and opportunity costs from tied-up funds that could be utilized more effectively elsewhere (Barrow & Kourentzes, 2016). By implementing effective inventory management practices, firms can consistently meet or exceed customer expectations, thereby enhancing their overall operational performance.

According to Heizer, Render, Munson, and Sachan (2017), efficient inventory management helps firms reduce tied-up capital, thereby maximizing shareholder wealth, a primary objective for most organizations. By effectively managing inventory and coordinating supply chain systems, firms can achieve improved performance. In the healthcare sector, organizations are increasingly implementing efficient stock management practices to maintain SCP (Kritchanchai, 2016). Information technology has revolutionized inventory management in healthcare facilities by enhancing the storage, dispensation, delivery, and interchange of information within companies and across the supply chain with customers and suppliers (Laudon & Laudon, 2016). Technologies for instance VMI and CPFR leverage automation to streamline the movement of both physical materials and information between companies, thereby improving overall supply chain efficiency (Laudon & Laudon, 2016).

Eke *et al.* (2016) studied, the influence of stock management on organizational

performance in chosen manufacturing firms in Singapore. They emphasized on pivotal role of Material Requirement Planning (MRP) in predicting and managing inventory needs, facilitating the smooth flow of raw materials among organizations (Volkov, 2017).

In Africa , inventory management practices is essential to many organizations in both the private and public sector and many uses inventory practices not only to ensure materials and products timely availability but also to ensure superior customer service and to achieve competitive advantage. While many organizations use internal inventory practices as a way to achieve organizational objectives such as enhanced efficiency and improved supply chain performance, adoption of effective inventory management practices have been a challenge to many(Onchoke &Wanyoike, 2016). In recent years, a number of organizations in African Countries have faced numerous challenges especially in inventory management or material control, thus affecting the performance of companies. There have been cases of materials overstocking which eventually get expired or out dated, under stocking, lack of stock-taking, theft of materials by workers and delays in deliveries of materials into the organizations among others. Over the years, companies all over the world had adopted the concept of inventory management as a way of improving their supply chain performance.

In Nigeria, Augustine and Agu (2013) found that irrespective of the fact that most organizations in Nigeria attempt to apply the tenets of good inventory management, they from time to time run into the problems of inventory inadequacy. This consequently affects their production, leading to the scarcity of one brand of their products or the other, thereby affecting their profitability and consequential effectiveness negatively.

Research by Atnafu & Balda (2018) examined how inventory management influences the

economic aptitude and performance of SMEs in Ethiopia, establishing a positive relationship with various aspects of organizational performance. Similarly, research conducted in Zimbabwe found that stock administration significantly impacts the financial performance of SMEs in the manufacturing sector (Muchaendepi, Mbohwa, Hamadishe & Kanyepe, 2019).

Balda (2018) also emphasized that effective inventory management not only enhances performance but also contributes to competitive advantage. In the context of Ethiopian dairy businesses, recent developments in inventory management practices highlight the importance of well-organized and regulated product supply chain management. Even though it applies to industry and horticulture drove economies, the requirement for standardized store network coordination is fundamental because, the achievement of such drive, in addition to other things, relies upon the degree of store network coordination (Lemma, 2018).

Efficient inventory management practices are achievable through various means and procedures, such as the implementation of the just-in-time (JIT) system and the utilization of MRP, JIT emphasizes lean operations and minimizes waste by aligning production closely with demand (Inegbedionn *et al.* 2019).

In Kenya, inventory management plays a crucial role, contributing approximately 56% to annual firm sales and turnover. The intensifying competition among Kenyan firms underscores the importance of strategic inventory management for gaining a competitive advantage and enhancing overall performance. This competitive environment motivates firms to adopt advanced methods and techniques to measure and manage scarce resources effectively, aiming to eliminate waste. Heizer *et al.* (2017) assert that firms proficient in

resource management, including inventories, are better equipped to maintain competitiveness and enhance performance. Meanwhile, Mulandi and Ismail (2019) studied the impact of stock management practices within commercial National Companies in Kenya, finding that both the JIT inventory system and MRP positively as well as significantly correlated with performance. They recommend increasing investments to enhance the functionalities of JIT and MRP systems for further performance improvements.

Ngei and Kihara (2017) explored the impact of inventory management systems used by gas manufacturing multinationals in Nairobi County on performance, emphasizing the strategic importance of efficient inventory practices across various sectors in Kenya's competitive business environment.

Oballa (2015) establish that inventory investment and correctness in stock records certainly effect organizational performance, whereby inventory decrease has a adverse effect. Makori and Muturi (2018) discovered that automated inventory systems enhance demand management and reduce storage space requirements. They recommend increased investment in the health sector, especially with devolved functions, to improve service delivery in Western Kenya hospitals through technology and infrastructure maintenance. Hussein and Makori (2018) highlighted that effective inventory management contributes positively to the performance of commercial State Corporations in Kenya.

Kisumu County Regional Health face tasks in register management, leading to issues such as drug stockouts, delayed emergency responses, inadequate theater equipment, and food supply delays for patients (Kisumu County Integrated Development Plan (CIDP) 2013-2017). These challenges contribute to lower rates of childbirth in health facilities compared

to national averages.

Despite numerous studies on inventory and supply chain management to enhance performance, studies on inventory management practices and SCP in county governments across Busia, Bungoma, Kakamega, and Vihiga counties in Western Kenya remain scarce. Therefore, this study aims to address this gap by examining inventory management practices including SCP in these counties.

1.1.1 Inventory Management Practices

Silver (2018) emphasizes that inventory management aims to mitigate risks across warehouse operations and enhance the utilization of resources such as data, materials, workforce, and energy from production to consumption levels. Inventory management involves control methods that monitor inventory levels, determine when replenishment is necessary, and decide the order sizes needed (Waters, 2013). Various studies have explored different aspects of inventory management practices. According to Silver (2018), inventory management aims to mitigate risks associated with warehouse operations and enhance the efficient utilization of resources across all stages, from creation to consumption.

Researchers have explored a variety of inventory management practices across different studies. Hussein & Makori (2018) examined Inventory control, method examination, inventory investment, and Warehouse management. Muchaendepi *et al.* (2019) focused on Just in Time (JIT), Material Requirement Planning (MRP), and Vendor Management Inventory (VMI). Kiboko (2017) investigated a range of practices including FIFO Concept, EOQ, ABC analysis, Radio Frequency System, VMIs, ERP, JIT, and Marginal Analysis. Okumu & Bett (2019) studied Economic Order Quantity (EOQ), material/inventory

handling, quality control, and legislation. Kaligirwa (2019) examined materials handling practices, lead time management, and storage management practices. In this context, the inventory management practices employed in the study included EOQ, VMIs, JIT as well as LIP.

Economic Order Quantity denotes to the optimal amount of inventory firms should demand to minimize inventory costs such as shortages and carrying costs. The goal of EOQ is to reduce spending by identifying the most cost-effective order quantity per cycle (Reid, 2023). Research has consistently shown that EOQ significantly influences organizational performance (Kinyua, 2016; Musau *et al.* 2017; Muchaendepi *et al.* 2019; Okumu *et al.* 2019).

Vendor Managed Inventory (VMI) is an inbound logistics strategy where suppliers assume responsibility for managing their customers' inventories based on real-time demand data provided by the customer (Hall, 2001). Kinyua (2016) demonstrated that an increase in VMI positively impacts operational performance in consumer goods manufacturing. Studies by Kinyua (2016), Khalid and Lim (2018), Wafula (2016), and Shajema (2018) confirm that VMI systems enhance operational performance.

JIT inventory management is an approach that enhances effectiveness and reduces excess by ordering inventory on a need basis, thereby minimizing storage costs (Lee, 2013; Monden, 2011). Unlike traditional methods that stockpile inventory as a precaution, JIT requires accurate demand forecasting. Numerous studies have established that JIT positively influences performance across various sectors (Rathi & Singh, 2019; Lee, 2013; Muchaendepi *et al.* 2019; Kanguru, 2016; Mulandi & Ismail, 2019; Omondi & Namusonge, 2015; Kinyua, 2014; Musau *et al.* 2017).

Kros *et al.* (2016) describes lean inventory practices as a postponement of JIT principles, aligning production throughout SC. Lean practices aim at minimizing waste and enhancing efficiency, contributing positively to organizational performance. Wamalwa *et al.* (2014) outline lean supply chain management as a philosophy in operational and tactical management within the supply chain, utilizing internet-enabled innovations to facilitate continuous improvement in the relationships with providers and service partners. Hofer (2011) and Shajema (2018) have conducted studies demonstrating that lean inventory practices positively influence performance. Similarly, Odhiambo and Kihara (2018) established that incorporating lean principles into inventory practices enhances supply chain performance.

However, Muchaendepi *et al.* (2019) observed that various inventory management systems used by manufacturing companies do not consistently impact supply chain performance. This underscores a substantial gap between theoretical frameworks and practical implementation of inventory management systems. While several studies, such as those by Shajema, Odhiambo, and Kihara (2018), indicate positive performance outcomes associated with lean practices, Gad (2017) found that lean methodologies had limited significance on performance, particularly in procurement functions within manufacturing industries. This suggests a need to reconcile these disparities and optimize the application of lean principles in different organizational contexts.

1.1.2 Supply Chain Performance

According to Zhang and Okoroafo, (2015) Supply Chain Performance is the capability to distribute the exact merchandise to the precise site when only needed, optimizing logistics costs. This definition encompasses timely delivery, cost efficiency, and value to the end

consumer. Whitten (2012) emphasizes that supply chain performance involves providing products and services of specified quality, quantity, and timeliness while minimizing total costs. According to Merediti (2022), supply chain performance reflects the effectiveness of each stage in an e-commerce supply chain, focusing on the cost optimization, efficiency improvement, speed enhancement, and meeting customer expectations. Performance, as defined by Mahmudova (2018), refers to the accomplishment of tasks based on well-defined standards. Umemezia and Edobor (2021) suggest that performance entails actions aligned with organizational objectives, varying in definition due to its contextual nature. Ghadem *et al.* (2016) describes performance as the extent to which organizational activities achieve goals and objectives.

Furthermore, several studies have measured Supply chain performance in terms of; Smooth Operations, cutting down on tied-up capital, Minimization on inventory ordering, Product/service Quality, Minimization of holding cost, Customer satisfaction, Sales growth, and Profitability. (Shin Wood & Jun 2016; Heizer, Render, Munson, & Sachan, 2017; Kaligirwa 2019; Kiboko ,2017; Muchaendepi, Mbohwa, Hamandishe & Kanyepe, 2019; Okumu *et al.* 2019; Hussein, & Makori, 2018; Mulandi & Ismail (2019). Achieving performance excellence is a critical objective for organizations. Singh *et al.* (2010) underscored the influence of SC practices on organizational performance, highlighting that ineffective inventory management can adversely affect operational aspects such as elasticity, transfer, rate as well as excellence (Sambasivan, 2011).

Elastic stock control management is crucial in enhancing organizational performance (Ogbo, 2014). This research aims to assess SCP based on metrics including product/service quality, cost reduction, efficiency levels, responsiveness, and customer satisfaction. These

factors collectively contribute to achieving and maintaining high organizational performance standards.

1.1.3 County Government.

County governments in Kenya are tasked with maintaining effective inventory management and other supply chain activities in harmony with the PPAD Act (2015) and succeeding regulations (2020). This framework aims to ensure the provision of quality, accessible, timely, and affordable services to the public. In Kenya, the 2013 presidential taskforce revealed that state-owned enterprises (SOEs) made losses in the financial year 2009/10 and 2010/11 and some of the reasons cited are lack of sound inventory management practices, poor reporting and tracking systems, lack of sound internal control systems and misappropriation of financial resources. Hussein (2017) noted that despite significant financial allocations, revenue collection in counties has often fallen short of targets. The study underscored that implementing effective inventory management practices and providing relevant training can substantially enhance financial sustainability. Counties with highly automated systems demonstrated superior performance compared to those relying on manual processes.

Counties in the Western region of Kenya faces numerous challenges, including issues such as overstocking, understocking, and poor service delivery characterized by delays across various departments, particularly in the government health and educational sectors (Onkundi & Bachangi, 2016). These challenges stem from inadequate forecasting of requirements, delays in delivery schedules, insufficient staffing, and disorganized storage facilities, all of which hinder effective information sharing between customers and suppliers, thus impacting overall supply chain performance.

Improper management of inventory can lead to increased costs, longer lead times, and poor delivery of goods and services (Wisner *et al.* 2011). USAID (2012) asserts that inventory management is crucial for efficient system operation, and poor management can result in wastage of financial resources, shortages of critical services, and expiration or missed deadlines for goods. According to Sambasivan (2011), inadequate inventory management has negative implications for operational performance, affecting flexibility, delivery capabilities, costs, and quality standards. Flexible inventory control management, as highlighted by Ogbo (2014), is essential for achieving organizational performance goals.

1.2. Statement of the problem.

According to Onkundi *et al.* (2016), counties in the Western region is faced with several challenges, including overstocking, high inventory costs, stock obsolescence, stock-outs, understocking, and poor service delivery in sectors like health and education. These issues stem from inadequate forecasting of requirements, lack of scheduled delivery times, insufficient staff for receiving and issuing goods, and disorganized storage facilities. These factors collectively hinders performance. In Kenya, the 2013 presidential taskforce revealed that state-owned enterprises (SOEs) made losses in the financial year 2009/10 and 2010/11 and some of the reasons cited are lack of sound inventory management practices, poor reporting and tracking systems, lack of sound internal control systems and misappropriation of financial resources.

Furthermore, the performance of the supply chain in Counties has been hindered by the failure of the County Government to comply with the established supply chain policies such as procurement regulations and practices in inventory management. Consequently many Counties grappled with misuse of tax payers money and inability to meet there

supply chain performance targets.(Owago *et al.*,2021). Besides the implementations of budgets by County Governments is hindered by poor inventory management practices which lead to slow absorptions of funds into developments projects and the provisions of other critical services (Wandera *et al.*; 2023).For instance the Western Counties have struggled to keep up with demands as there have been numerous stock out or complete shortages of a number of stock items when it was evidence that the supplier's delivery schedules weren't being met.

The Kenya Medical and Suppliers Agency (KEMSA) has on several occasions stopped the supply of drugs to all hospitals in the County due to a Kshs.285million debts owed to the agency by the County government (Kinyanjui,2021). Delivery uncertainty is more likely to occur because the procurement department frequently gives the supplier little notice or ask for frequent schedule modifications. This demonstrates that department has not established its order and reorder levels which is a good practice in inventory management(Auditor-General Report; 2020). This is one of the motivations to investigate on the effect of inventory management practices on supply chain performance in County Governments in Western Region, Kenya.

Studies have been done on inventory management. However, they were done in different contexts for instance in Asia (Shin Wood & Jun 2016; Heizer, Render, Munson & Sachan, 2017); Ethiopia (Atnafu & Balda, 2018); in Uganda (Kaligirwa, 2019) and in Zimbabwe (Muchaendepi *et al.*, 2019) which is quite different from the current study context. Further studies have been done in different sectors such as education sectors (Nzioka & Were 2017) and Commercial State corporations Mulandi and Ismail (2019) unlike this study that focuses on the county governments in Western region, of Kenya. Moreover, the studies

focus on influence of inventory management on other dependent variables for instance Operational performance (Gitau, 2016); organization performance (Kanguru, 2016; Njoroge, 2015; Muchaendepi *et al*, 2019) while this study focuses on supply chain performance in Kenya. Furthermore, different independent variables have been used by different researchers giving different results on performance for instance Wafula (2017), Economic Order Quantity, Just In Time Technique, Vendor Managed Inventory, and ABC analysis. while (Gad, 2017) used LIS, SSP, and lastly IT adaptation and above all very few or limited studies have been done on the impact of inventory management practices and SCP with the below understated independent variables, EOQ, VMIs, JIT as well as LIP which were in focus of the researcher.

To fill the above gaps such as contextual, sectorial and conceptual gaps, the current study sought to assess the effect of inventory management practices and SCP of county governments in the western region, of Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of this study was to establish the effect of inventory management practices on supply chain performance of county governments In Western Region, Kenya

1.3.2 Specific Objectives

The objectives of this study entailed the following:

- i.** Evaluate the effect of economic order quantity on supply chain performance in county governments within Kenya's western region.

- ii. Investigate the effect of vendor-managed inventory systems on supply chain performance in county governments in the western region of Kenya.
- iii. Examine the effect of Just-In-Time practices on supply chain performance in county governments in Kenya's western region.
- iv. Examine the effect of Lean inventory practices on supply chain performance in county governments in the western region of Kenya.

1.4. Study Hypothesis

H0₁: Economic order quantity has no significant effect on the supply chain performance of county governments in the western region, Kenya.

H0₂: Vendor-managed inventory system has no significant effect on the supply chain performance of county governments in the western region, Kenya.

H0₃: Just in time has no significant effect on supply chain performance of county governments in the western region, Kenya.

H0₄: Lean inventory practices has no significant effect on supply chain performance of county governments in the western region, Kenya.

1.5. Significance of the Study

This study is expected to provide substantial contribution to the Kenya vision 2030 as one of its strategies is to register suppliers for goods, services and works thus reduces set-backs such as increased storage, ties-up cost, stock obsolescence that would eventually disrupts supply chain performance.

This study is expected to provide substantial evidence that county governments in the western region of Kenya can enhance their performance by effectively managing their inventory. As a result, county managers will find this research beneficial for both knowledge acquisition and practical application. The study's findings could offer insights into inventory management practices that would inform both current and future policy decisions, serving as a guideline for policymakers in designing effective strategies for inventory management. Additionally, the research will be valuable to scholars by laying the groundwork for further studies in the areas of inventory management and operational performance, particularly within county government institutions.

The research findings are anticipated to establish a solid foundation for future studies in inventory management. They will be a valuable resource for academics, scholars, and researchers interested in this field, contributing to the advancement of knowledge, especially within county operations. By addressing gaps in current understanding, the study is likely to generate new ideas and knowledge, helping to close the knowledge gap in inventory management.

1.6. Scope of the Study

The study aimed to determine the impact of inventory management practices on supply chain performance within county governments in Kenya's Western region. Some of the specific objectives for the study included, to evaluate the effect of economic order quantity on supply chain performance , to investigate the effect of vendor-managed inventory systems on supply chain performance, to examine the effect of Just-In-Time practices on supply chain performance and lastly to examine the effect of Lean inventory practices on supply chain performance in county governments in the western region of Kenya. The study was conducted from **June to August 2024**.

The study targeted a total of 120 respondents from various departments, including supply chain, stores, and quality assurance.

1.7. Limitations of the Study

The researcher faced several challenges during the study. One issue was the busy schedules of county officers, which made them hesitant to participate in the survey. To overcome this, a one-on-one facilitation approach was used to persuade the respondents to participate which was fruitful to a greater extent while those who were totally unable, questionnaires were left behind to be responded to on a later date and were then collected by research assistant having been filled.

Another common challenge experienced was with questionnaire surveys tool as a result of risk of a low response rate, which would lead to biased results that don't accurately represent the population (Saunders & Lewis, 2000). To mitigate this, a brief questionnaire with closed-ended questions was created. Additionally, the researcher and assistants personally delivered all questionnaires to increase the response rate.

There was also the concern that respondents might provide socially desirable answers rather than their true opinions, especially if they felt influenced by the researcher's presence. To address this, respondents were assured that all information collected would be treated with the utmost confidentiality, and they were encouraged to answer the questions honestly. They were also informed that their responses would not be linked to them personally.

To ensure the questionnaires were completed by the intended respondents, the researcher first verified each respondent's role in the county government before handing over the questionnaire. A question asking respondents to specify their role was also included in the

questionnaire.

Finally, due to study's broad coverage, the researcher was concerned about meeting the data collection deadline. To speed up the process and meet the deadline, four research assistants were hired to help collect data across large geographic areas.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The primary objective of this chapter is to examine existing literature on the inventory management practices of county governments, to identify any significant gaps that need to be addressed. The chapter begins by defining inventory management and discussing the importance of effective inventory management practices for county governments. It also outlines the various models and systems that can be used to manage inventory. This is followed by a review of previous studies on the inventory management practices of county governments, including evaluations of their effectiveness. The chapter then highlights the gaps found in the existing literature and concludes with a summary and final remarks.

2.2 Theoretical Review

The theoretical analysis outlines how different theories approach a problem/gap. Guiding theories used included EOQ, VMIs, JIT, and LIP theory as these helped to evaluate the effectiveness of inventory-management practices of County Governments.

2.2.1 Economic Order Quantity Theory

This theory, established by Ford Harris in 1913, is a crucial inventory management model designed to minimize total inventory holding and ordering costs. The model determines the optimal order quantity when inventory levels are low (Chambers & Lacey, 2011). It strikes a balance between ordering costs and holding (or storage) costs. Placing larger orders reduces the frequency of orders, thereby lowering ordering costs, but it increases average

inventory levels and holding costs. On the other hand, ordering smaller quantities reduces average inventory and holding costs, but it necessitates more frequent orders, leading to higher ordering costs. The Economic Order Quantity (EOQ) model aims to minimize the combined costs of holding and ordering inventory. It uses a formula to calculate the optimal inventory size (EOQ) to order, which minimizes these costs.

The EOQ serves as the foundation for a cost-effective procurement policy and a continuous-review inventory system, where inventory levels are constantly monitored, and a fixed quantity is ordered each time. Le Roux and Lotter (2003) note that this model assumes no purchase discounts, with costs and demand being constant and predictable. However, this classical inventory model overlooks factors like quality and shortages. There are several reasons why institutions, whether small or large, might adopt the EOQ model. Muhammad and Omar (2011) suggest that the model is particularly beneficial for small-business owners in determining how much inventory to maintain, how many units to order, and how often to reorder at the lowest possible cost. For business owners or managers, the EOQ model helps reduce storage and holding costs by providing guidance on when and how much to reorder, simplifying the ordering process and allowing them to focus on more critical tasks.

Despite its usefulness, the EOQ model requires a solid understanding of mathematics, which can be challenging for small-business owners who may lack these skills. Additionally, the EOQ assumes a constant demand for a business product and the immediate availability of inventory items for restocking, without accounting for seasonal fluctuations (Houston Chronicle, 2015).

This model is relevant to the study as it aims at reducing the buffer stock, ensuring vendor

demand forecasting as well as ensuring stock level management or maintaining optimum stock that is collectively ensures high customer satisfaction levels in an organization, risks minimizations associated with the inventory costs and shortage cost. The theory therefore provides a linkage between Economic Order Quantity and Supply Chain performance of the County Government in Western Region, Kenya.

2.2.2 The Network Theory

The Vendor Managed Inventory concept discussed in this study is based on the Network Theory, with Katz *et al.* (2004) being the main proponents. This conceptual framework is utilized to analyze relationships and interactions among actors in a network, emphasizing the importance of maintaining upstream and downstream relationships to optimize value within organizations. According to Katz *et al.* (2004), organizations must establish networks with other firms to succeed and increase their value. By networking with other firms, organizations can benefit from complementing each other's strengths and weaknesses. This exchange of resources and adoption of new processes adds value to all companies involved (Wamoto *et al.* (2023).

While the Network Theory provides valuable insights, it has faced criticism for oversimplifying complex social and organizational dynamics. Critics argue that it sometimes neglects the role of individual agency, power dynamics, and institutional contexts in shaping network outcomes (Maina & Were, 2018). Additionally, Maina & Were (2018) state that the theory's emphasis on structural properties may overlook the qualitative aspects of relationships, such as trust, reciprocity, and shared norms, which can significantly impact network behavior and performance. The applicability of Network Theory across different contexts and organizational settings has also been questioned.

Considering cultural differences, regulatory environments, and technological advancements that influence network interactions requires careful consideration and contextual adaptation (Elvander *et al.* (2017).

Network Theory offers a useful framework for examining how relationships between government agencies, suppliers, and other stakeholders influence supply chain performance. By analyzing the network structure that emerges from inventory management practices, researchers can identify key nodes (e.g., centralized warehouses, procurement departments) and ties (e.g, supplier contracts, inter-departmental communications) that impact the efficiency, cost-effectiveness, and responsiveness of the supply chain. For example, the theory can reveal whether decentralized inventory management practices lead to quicker response times in emergencies or if centralized procurement networks enhance economies of scale but suffer from bureaucratic delays. Additionally, Network Theory can shed light on informal networks and power dynamics that exist alongside formal organizational structures, providing insights into how trust, information sharing, and collaborative norms affect supply chain outcomes.

Network Theory offers a comprehensive framework for understanding the complexities of inventory management practices and their effects on SCP within county governments. By integrating insights from Network Theory into your study, you can uncover nuanced relationships, structural advantages, and potential bottlenecks that influence operational effectiveness and service delivery. However, it is essential to complement network analysis with qualitative research methods to capture the full spectrum of social interactions, institutional contexts, and individual behaviors that shape supply chain dynamics in governmental settings.

2.2.3 Just-In-Time Theory (JIT)

Just-in-Time (JIT) originated in Japan in the 1930s and quickly became a widely adopted approach by organizations worldwide. According to Kros *et al.* (2016), JIT is a pull-based system designed to synchronize production and business processes across the supply chain. Essentially, JIT entails producing only what is needed, when it is needed, and in the quantity needed. Beyond being just an inventory control method, JIT is a philosophy aimed at eliminating waste throughout production processes (Rahmani, 2014). By achieving its primary objectives, JIT offers several key benefits. Firstly, it enables organizations to effectively manage ordering and delivery processes in response to production demands, thereby enhancing flexibility. Secondly, JIT minimizes inventory levels, leading to significantly reduced inventory-carrying costs for organizations (Nemtajela, 2016).

Companies that adopt JIT production systems prioritize minimizing inventory levels while ensuring timely delivery of goods and services to customers (Salehi, 2010). This method does not only improve operational effectiveness but also supports lean manufacturing principles by streamlining processes and eliminating non-value-added activities.

Although JIT inventory management grants a manufacturer a bounty of improvements to efficiency and revenue, the management style can be risky for a few reasons. Some businesses find JIT management to be a gamble because it can become very costly or detrimental to revenue when supply cannot meet demand. When Toyota experienced a supply chain shortage in 1997 due to a fire at their supplier's warehouse, for example, the company experienced a 160 billion yen loss in revenue. JIT management can also be expensive to introduce as well as costly to maintain. Being that just-in-time aims at reducing defects and improving quality, deducing production time, maintaining a flexible

workforce, and optimizing production schedules as well as freeing up physical space it might be used in the research to ensure inventory control/ management. The successful implementation of Just-in-Time (JIT) achieves significant benefits, including the potential elimination of inventories, which allows organizations to effectively manage ordering and delivery processes to meet production demands and enhance flexibility. Moreover, reducing inventories leads to minimal inventory-carrying costs for the organization (Nemtajela, 2016).

Drawing from insights by Ramahani (2014), Salehi (2010), and Kros *et al.* (2016), the concept of JIT in inventory management serves as the basis for a study aiming to explore its impact on the SCP of county governments in the western region of Kenya. This study adopted JIT principles to assess how system automation and timely delivery would eventually lead to increased supply chain performance County government in Western Region. Kenya.

2.2.4 Lean Inventory Theory

Heizer and Render (2006) defined inventory management as a constant provision of normal items subject to autonomous demand, whereby speculative quantity ought to be available. Lean model focuses on improving costs within inventory systems, streamlining decisions across manufacturing, warehousing, and broader supply chain operations (Tempelmeier, 2011). This approach is built upon the EOQ theory, which aims to enhance the quantity ordered for each element. The reason for choosing Lean Inventory Theory for this study stems from its potential impact on organizational performance through efficient inventory management practices. Green and Inman (2005) examined how lean model can eradicate excess stocks and lessen waste in the production process. Critics argue that lean

theory's effectiveness hinges on close, lasting partnership and material sharing between firms and their trading associates. Nevertheless, Bozarth *et al.* (2010) assert that inventory management, as a core component of any supply chain—whether for products/services—plays crucial role in aligning demand and supply amid the uncertainties of today's global business environment.

In developing countries, ineffective inventory control is prevalent due to reliance on imported materials and bureaucratic delays, hindering accurate computation of order lead times (Chen, Frank, & Wu, 2007). Thus, Lean theory remains essential for optimizing inventory management, potentially enhancing profitability, responsiveness, customer satisfaction, resource efficiency, flexibility, cost- effectiveness, and asset management. The study adopts Lean inventory practices to explore it construct like flexible ordering as well as framework contracting impact on supply chain performance, drawing from insights by Tempelmeier (2011), Kros, Falasca, & Nadler (2006), Eroglu & Hofer (2011), and Bozarth *et al.* (2010).

2.3 Conceptual Review

2.3.1 Economic Order Quantity (EOQ)

Economic Order Quantity refers to a model that calculates the ideal quantity to order whenever inventory levels reach depletion (Caldwell, 2021). It balances the trade-off between ordering costs and holding (or storage) costs. Placing larger orders lessens the frequency of orders thus reducing ordering charges, but it raises average inventory levels and holding costs. Economic order quantity allows companies to meet demand without overspending by managers calculating EOQ to minimize holding costs and excess

inventory. EOQ has been measured by several researchers for instance in terms of; Price/cost reduction, Inventory levels, delivery dependability, improved delivery times, and customer lead time.(Wafula *et al.* 2018), efficiency, optimal production, on-time delivery as well as quality. (Kinywa *et al.* 2016), and tracking of inventories, service delivery, and stock level management and avoiding stock out (Nzoka & Wafula, 2017; Elsa & Bett, 2019) measured in terms of stock level, prompt responses in terms of market fluctuations as well as minimization of buffer stock. In this research it was measured in terms of Buffer Stock levels, vendor demand forecasting, and stock level management.

2.3.2 Vendor Managed Inventory System

VMIs is an inbound logistics action plan where suppliers take responsibility for managing their customers' inventories based on demand information provided by the customer (Hall, 2001). This approach enhances information sharing between partners, including data such as point-of-sale, order fulfillment updates, and production schedules. Such collaborative information sharing empowers inventory management to reduce costs and enhance decision-making capabilities (Nachiappan, 2005).

Vendor-managed inventory has been measured in terms of productivity, manufacturing outcomes, customer loyalty, and accumulation of Pricing inventory. (Khalid & Lim, 2018), buyer-supplier integration, sales growth rate, market share, and profitability (Shajema *et al.* 2018). Wafula (2018) used customer lead time, better forecasting, delivery dependability and improved delivery times while Kinyua (2016) assessed it in terms of efficiency, optimal production, on-time delivery, and quality where this study measured VMIs it in terms of Order fulfillment, buyer-supplier relationship and information sharing.

2.3.3 Just-In-Time

According to Kros (2016), Just-in-Time (JIT) is a pull-based system that aims to synchronize production as well as business processes across the entire supply chain. It emphasizes producing goods only as they are needed, in the quantities required, and at the appropriate time. Rahmani (2014) similarly defines JIT as a production philosophy centered on eliminating waste of resources.

Just in Time has been measured in terms of waste reduction, cost reduction, order meeting, timely delivery, and low inventory carrying cost. (Muchaendepi *et al*, 2019), improved service delivery, optimization of production Schedules, as well as reduced stock out; (Nzioka *et al*, 2017) improved communication and relationship, timely delivery and lower costs hence improving efficiency (Kariuki. 2017). The researcher measured it in terms of on-demand delivery and system automation where on-time delivery/timely delivery refer to the metric used to measure supply chain efficiency while system automation is a tool that helps businesses keep track of their stock levels automatically with minimum human intervention. It also means a proactive system that can help businesses avoid: Stock out and lost sales.

2.3.4 Lean Inventory Practices

Kros (2016) explains that lean is an extension of the concepts behind JIT that focuses on eradicating of excess stock thus reduces waste. It has been measured in terms of minimum level, optimum level, reliability, responsiveness, flexibility, asset, and cost. (Ndiwa, 2022), Storage location, storage size, staff competency as well as profit before tax. Hussein and Makori (2018) underscore the importance of demand management, waste elimination, and

standardization in business or organizational performance. Shajema *et al.* (2018) focus on waste elimination, stockouts, and inventory levels as critical factors impacting operational efficiency. Gad (2017), procurement costs, timely delivery and waste reduction on overall performance. Kihara *et al.* (2018) contribute insights into these areas as well. Additionally, Green and Inman (2005), reduction of buffer stock and waste minimization where this study measured lean inventory in terms of framework contracting and flexible ordering.

2.3.5 Supply Chain Performance

Supply Chain Performance refers to how efficiently each stage of e-commerce Supply Chain enhances costs and meets buyer demands. Meredith *et al.* (2022). The researcher measured it in terms of Service/product quality, Customer satisfaction level, cost reduction, level of efficiency, and lastly extent of responsiveness.

2.3.5.1 Customer Satisfaction Level

Melastr and Giantari (2019) defined customer satisfaction as the perception customers have of a business, emphasizing that it is based on an overall evaluation rather than a single transaction. Research has shown that customers who experience higher levels of satisfaction tend to be more loyal to a brand and positively influence word of mouth (WOM) (Melatri & Giantari, 2019). WOM, one of the oldest forms of market communication (Pourkiani *et al.* 2014), occurs when individuals share their experiences regarding a purchase or service, which can subsequently influence the expectations of others. Hallencreut and Parmaler (2021) highlighted that high customer satisfaction contributes to an improved company image and fewer customer complaints. Additionally, cost reduction can serve as an effective strategy for enhancing customer satisfaction, as

satisfied customers often respond positively when their expectations align with the actual performance they experience (Kashkoli, 2017).

2.3.5.2 Cost Reduction

According to Chidibere (2023), cost reduction is the process of reducing expenses to increase profitability. It involves implementing strategies to cut costs without sacrificing the quality of the product or services offered. This is done by identifying areas where expenses can be reduced or eliminated without compromising quality. Effective cost-reduction strategies may include restructuring operations, eliminating waste as well as negotiating better prices with suppliers. By reducing costs, a business can offer its products or services at a lower price than its competitors, giving it a competitive advantage in the marketplace.

2.3.5.3 Level of Efficiency

According to Shankar and Aroulmoji (2020), efficiency in supply chain operations comprises streamlining procedures, cutting waste, and minimizing resource usage. Efficiency also ensures that stockouts are kept to a minimum, carrying costs are decreased, customer satisfaction as well as increasing profitability. This helps businesses to better allocate their resources, such as labor, materials and equipment, towards activities that generate the most value. By improving efficiency through cost reduction, businesses can operate more effectively and position themselves for long-term success.

2.3.5.3 Extent of Supplier Responsiveness

Supplier responsiveness involves a cross-functional approach that enables the adjustment of resources and sourcing activities in response to global market threats and opportunities. It is

a measure of how promptly and effectively an organization meets its customers' needs. The concept of responsiveness as a component of service quality carries several significant implications.

Firstly, responsiveness is intertwined with customer service—the quality and timeliness of interactions between employees and customers. Secondly, service quality aims to enhance customer experiences, surpass expectations, and boost satisfaction. Responsiveness is not merely viewed as a duty or essential organizational feature but as a value-adding aspect of service. Thirdly, the focus extends beyond diverse or disadvantaged groups to enhancing the experience of all customers. According to Famiyeh (2018) and Esaiasson (2017), suppliers align their actions with organizational goals to acknowledge the time customers invest in making purchases. The ability of employees to promptly address customer needs is positively perceived by consumers, enhancing their overall experience.

2.4. Empirical Review

2.4.1 Economic Order Quantity and Supply Chain Performance

Numerous studies have examined the impact of Economic Order Quantity (EOQ) on organizational performance. For example, Essien and Effiong (2022) conducted a review of relevant literature in EOQ by assessing the impact it has on organizational performance. Twenty articles were reviewed, and the findings revealed that EOQ had a significant association with organizational performance. Magaji, Kabiru and Hassan (2024) assessed the Inventory Control Analysis by utilizing Economic Order Quantity (EOQ) Method at Nina Plastic Ltd in Nigeria. Data was collected using preliminary surveys, literature review and field survey methods. Descriptive analysis was utilized for data analysis. Findings

revealed that EOQ resulted to cost savings. Contrary to the above studies that focuses on the organizational performance the current study is on supply chain performance in the County governments as well as all are on different sectors thus creating a gap.

Atnafu and Balda (2018) investigated how EOQ influences the competitive strength and operational performance of micro and small enterprises (MSEs) in Ethiopia. Their descriptive research, which involved 188 MSEs in the manufacturing sector, found a positive correlation between EOQ and organizational performance. The study employed structured questionnaires, analyzed the data using SPSS, and presented the results in tables and charts. Unlike this study, that focuses on how EOQ influences the competitive strength and operational performance of micro and small enterprises (MSEs) in Ethiopia, the current study focuses on the county government in Kenya's western region, the findings may differ due to varying contextual factors.

Bawa *et al.* (2018) examined the effect of inventory management on the performance of listed industrial companies in Ghana, data collected from fourteen firms registered on the Ghana Stock Exchange over a decade (2007-2016). They used regression equations to measure return on assets and operating cash flow, and tested their hypothesis using both Pearson correlation and multiple regression analysis. The empirical findings showed no significant impact on firm performance within the context of Ghana's manufacturing sector. Unlike their study, which concentrated on listed firms in Ghana, the current research examines inventory management within the county government of Kenya's waste.

Studies have also examined the impact of Economic Order Quantity (EOQ) on organizational performance. A study by Agum, Olanrewaju and Anyuabaga (2018) done in the College of Education showed that EOQ had a significant effect on the quality and

quantity of products and it also minimized costs for organizations in the region. Structured questionnaires were used for data collection and as for data analysis regression was done. Unlike their study that focuses on organizational performance in Education college, the current study focuses on supply chain performance in County government thus the findings may differ due to varying sectorial factors

Onchoke and Wanyoike (2016) studied the effects of inventory control practices on procurement performance among agrochemical distributors in Nakuru Central Sub-County, Kenya. They collected data through structured questionnaires distributed via a drop-and-pick method, using descriptive statistics for analysis and employing correlation and regression analyses to assess the impact of independent variables on procurement performance. Their findings indicated that internal inventory security procedures, inventory auditing, and computerized inventory control had a positive and significant influence on procurement performance. While their study used descriptive analysis, the current research incorporates both descriptive and inferential methods, which may result in different outcomes.

Kaithe and Achuora (2017) conducted an empirical study on how inventory management practices impact the performance of private commercial banks in Kenya. They collected data using self-administered questionnaires and used both descriptive and inferential statistics to evaluate relationships between variables. Their findings revealed that independent variables, such as information technology and warehouse management systems, positively correlated with the performance of private commercial banks in Kenya. In contrast, the current study examines different independent variables, including Economic Order Quantity, Vendor Managed Inventory System, Just-In-Time, and Lean Inventory practices, which may produce different research outcomes.

Oballah, Waiganjo, and Wachiuri (2017) conducted an empirical study on the impact of inventory management practices on institutional performance in public health institutions in Kenya. Their findings showed that inventory management and the accuracy of inventory records positively influenced organizational performance. The study employed a descriptive case study design and analyzed data using SPSS. In contrast, the current study focuses on inventory management practices and supply chain performance in the county governments of Kenya's western region, which may yield different results due to the distinct research contexts.

Wafula (2016) researched the effect of inventory management on operational performance in oil marketing companies in Kenya and found that Economic Order Quantity positively influenced operational performance. The study used a descriptive research design targeting 75 oil marketing companies, a different sector from the current study. The dependent variable in Wafula's research was operational performance, while the current study focuses on supply chain performance.

Nzioka *et al.* (2017) examined how inventory management affects performance in Kenya's education sector. The study emphasized the importance of effective stock-level management, specifically using EOQ, to prevent stockouts. Data were collected from all 100 supply chain officers at the Ministry of Education headquarters in Nairobi using a descriptive research design, with data analysis including both descriptive and inferential statistics. In contrast, the current study investigates inventory management practices and supply chain performance in the counties of Kenya's western region, which operates in a different sector.

Okumu and Bett (2019) explored the impact of inventory management on organizational performance in the steel industry, identifying a strong positive correlation between EOQ and organizational performance in steel manufacturing firms in Nairobi County. The study also

found a significant positive relationship between quality control measures and organizational performance. Data were collected using questionnaires from both primary and secondary sources. The current study, however, focuses on county governments in Kenya's western region, marking a significant departure from the prior research, which was centered on the manufacturing sector.

Kiboko (2017) examined inventory management practices in hotels in Mombasa, Kenya, and assessed the relationship between these practices and operational performance. The study used a descriptive survey approach targeting 37 hotels categorized as 3-star, 4-star, and 5-star establishments. Data were collected through questionnaires and analyzed using descriptive statistics and regression analysis. The findings showed that FIFO (First In, First Out) was the most commonly used inventory management practice, while other methods like marginal analysis, Enterprise Resource Planning (ERP), EOQ model, Just-In-Time (JIT), and Vendor Managed Inventory (VMI) were also widely utilized. ABC Analysis and stochastic models were moderately applied, and Radio Frequency Identification Systems (RFIS) were minimally used. However, the study concluded that these practices did not sufficiently explain the relationship between inventory management and operational performance in Mombasa hotels.

In contrast, the current study investigates the impact of inventory management on supply chain performance in county governments of Kenya's western region, focusing on a different sector. Unlike Kiboko's study, which examined operational performance as the dependent variable, this research assesses supply chain performance.

2.4.2 Vendor-Managed Inventory System and Supply Chain Performance.

Studies have been performed on Vendor Management Inventory Systems and supply chain performance. Khalid and Lim (2018) researched manufacturing firms in Asia on inventory management practices and operational performance and established that vendor management inventory systems have a positive influence on operational performance. The researcher used a descriptive research design. The study employed both primary and secondary data collection techniques with a sample size of 64 respondents being utilized. The research above may differ from the current ongoing research on various aspects as they are carried in different geographical locations, where the current research is in Kenya and the other one in Asia. This study was conducted in Asia in a manufacturing firm, unlike the current study that is in Kenya on County Government thus this may yield different results due to the distinct research contexts.

Kinyua (2014) researched inventory management practices and their impact on performance among consumer goods firms in Nairobi, Kenya, finding that Vendor Managed Inventory (VMI) has a significant effect on operational performance in consumer goods manufacturing. The study recommended that firms in this sector adopt VMI to improve operational efficiency. The research utilized a descriptive analysis with a sample size of 60 respondents. In contrast, the current study employs both descriptive and inferential statistics with a larger sample size of 120 respondents to explore the relationship between various inventory management practices and supply chain performance.

In a related study, Mukopi and Iravo (2015) established the effects of inventory management on procurement performance in sugar manufacturing companies located in the western sugar belt of Kenya. Their research revealed a strong positive relationship between

vendor inventory systems and procurement performance. Descriptive survey approach with structured questionnaires self-administered to 100 procurement personnel was used. Data were analyzed using SPSS and presented in tables and charts. While both studies were conducted in the western region of Kenya, the current research differs as it uses both descriptive and inferential statistical analysis to explore broader implications for supply chain performance.

Shajema (2018) conducted a study on the effect of inventory control practices on the performance of retail chain stores in Nairobi County, Kenya, revealing a significant and positive impact of Vendor Managed Inventory (VMI) systems. The study recommended that retail chain stores and other inventory-handling firms invest in enhancing their VMI systems. The retail sector, particularly wholesale and retail, plays a significant role in Kenya's economy, employing a substantial portion of the workforce. However, challenges such as structural inefficiencies in supply chains have affected the performance of large retail chains like Uchumi and Nakumatt, often attributed to inventory management practices.

Inventory costs constitute a significant portion of the total costs in retail chains, emphasizing the critical need for improved inventory management. Ngei and Kihara (2017) explored the impact of inventory management systems on the performance of gas manufacturing firms in Nairobi City County, using both primary and secondary data and employing multiple regression analysis. The results showed that Vendor Managed Inventory (VMI), Enterprise Resource Planning (ERP), Radio Frequency Identification, and E-procurement significantly influenced firm performance. Unlike the current study, which focuses on county governments in Kenya's Western Region, their research centered

on the manufacturing sector.

Oballa, Waiganjo, and Wachiuri (2015) studied the effect of inventory management practices on organizational performance at Kenyatta National Hospital in Kenya. They used a descriptive case study design and analysed data with SPSS, finding that inventory investment and the accuracy of inventory records positively affected organizational performance, while inventory shrinkage had a negative impact.

Michael and Wathe (2018) investigated the impact of inventory management systems on the performance of soft drink manufacturing firms in Kenya. Their study assessed Material Requirement Planning, Just in Time, Vendor Managed Inventory, and barcoding using a descriptive research design with 213 respondents from registered soft drink manufacturing firms. The research employed both qualitative and quantitative methods, including regression analysis with SPSS. This study was specific to the soft drinks manufacturing sector, differing from the current research, which focuses on county governments in Kenya's Western Region and uses both descriptive and inferential statistics for analysis.

2.4.3 Just-In-Time and Supply Chain Performance

Qureshi, Iftikhar, Bhatti, Shams, and Zaman (2013) conducted research on critical factors for implementing Just-in-Time (JIT) management through an Information Integration-based system in Pakistan's cement industry. They collected data from 400 operations managers in cement manufacturing firms using surveys, questionnaires, and interviews. The study found that JIT inventory management positively and significantly improves firm performance by reducing defects and ensuring continuous operational flow. The researchers emphasized the importance of strong top management commitment for

successful JIT implementation. Unlike this study, which examines the impact of inventory management practices on supply chain performance in county governments in Kenya's Western Region, Qureshi *et al.* (2013) focused on the cement industry in Pakistan.

Kaswan, Rathi, and Singh (2019) investigated the impact of JIT on decision-making in healthcare settings in India. Their empirical study, based on a literature review, suggested that JIT positively affects firm performance. In contrast, the current study explores the influence of inventory management practices on supply chain performance in county governments in Kenya's Western Region while the above was done in India in Healthcare and this can yield different results due to the distinct research contexts and sector in which the two studies were conducted.

Agu, Obi-Anike, and Eke (2016) evaluated the impact of inventory management on the organizational performance of selected manufacturing firms in Nigeria. The research aimed to determine how inventory control affects productivity within these firms. Data were primarily collected using structured questionnaires, and descriptive statistics were used for analysis. Pearson correlation coefficient and simple linear regression were employed to test the hypotheses. The results highlighted the crucial role of inventory management in business operations, with a recommendation for organizations to invest in training personnel in inventory control management to enhance smooth operations.

Muchaendepi *et al.* (2019) studied inventory management practices and performance among SMEs in Harare's manufacturing sector, noting the widespread use of the Just-In-Time (JIT) method. The study revealed that SMEs face supply chain challenges due to their reliance on JIT, requiring constant communication with suppliers to minimize material procurement times. The researchers called for further studies to identify areas needing more

attention. Using purposive sampling with 244 respondents, data were collected via questionnaires and analyzed using SPSS version 22, employing both qualitative and quantitative techniques. The study's regression analysis indicated significant effects of inventory management practices on firm performance.

Kinyua (2014) examined inventory management practices and their impact on operational performance in consumer goods firms in Nairobi, Kenya. The study found that implementing Just-In-Time (JIT) methodologies enhanced operational efficiency. It recommended that consumer goods manufacturers adopt effective inventory management practices to improve firm performance. The data were analyzed descriptively using SPSS version 20, with a focus on Nairobi, differing from the current research in Western region counties of Kenya.

Naliaka and Namusonge (2015) explored the role of inventory management in achieving a competitive advantage among manufacturing firms in Kenya, focusing on Unga Group Limited. The study assessed how information technology, Just-In-Time inventory practices, and inventory control influence competitive advantage. Using a descriptive research design, the study targeted 289 employees involved in inventory management, employing stratified and simple random sampling techniques to select 30 respondents. Data were collected through self-administered questionnaires and analyzed using SPSS for descriptive statistics. The findings emphasized the importance of inventory control systems and practices in gaining a competitive edge.

Nzioka *et al.* (2017) researched the impact of inventory management on the education sector in Kenya, finding that Just-In-Time (JIT) methodologies enhance service delivery performance within the Ministry. The study recommended reviving JIT replenishment

practices to ensure optimal inventory levels and quality product management. Conducted through a census survey of 100 supply chain officers at the Ministry of Education headquarters in Nairobi, the study used quantitative data analysis techniques, including descriptive and inferential statistics. This research, focusing on the education sector, differs from the current study, which examines supply chain performance in Western region counties of Kenya.

2.4.4 Lean Inventory practices and supply chain performance.

Ferencikova (2014) conducted research on inventory management in small and medium-sized manufacturing companies (SMMEs) and its impact on operational performance, revealing that lean inventory practices positively influence performance. The study employed a questionnaire with 50 respondents from Czech manufacturing companies, with data analyzed using SPSS. The research aimed to explore the relationship between inventory management and operational performance, whereas the current study investigates the relationship between inventory management and supply chain performance. Additionally, Ferencikova's study focused on SMMEs in the Czech Republic, while the current study is conducted within County Governments in Kenya's Western Region.

Kihara and Odhiambo (2018) examined the impact of inventory management practices on supply chain performance in government health facilities in Kisumu County, Kenya. They found that lean inventory practices significantly improve supply chain performance in these facilities. The study utilized both primary data from semi-structured questionnaires and secondary data, with analysis including descriptive and inferential statistics using SPSS version 21. Unlike this study, which focuses on counties in the Western Region of Kenya (Kakamega, Bungoma, Busia, and Vihiga), Kihara and Odhiambo's research was specific to Kisumu County's health sector.

Gad (2017) investigated the effect of inventory management control on the procurement function's performance at South Nyanza Sugar Company, assessing the influence of lean inventory systems, strategic supplier partnerships, and information technology adoption. The study, employing a correlational research design, included a census of 120 procurement department staff members. Data were collected through questionnaires, with reliability tested by the test-retest method and validity confirmed by expert opinion. Regression analysis revealed a negative yet significant relationship between lean inventory systems and procurement function performance. The study recommended cautious investment in lean inventory systems, emphasizing strategic supplier partnerships and IT adoption. In contrast, the current research focuses on the effects of inventory management practices on supply chain performance in county governments in Western Kenya.

Ndiwa (2022) explored the impact of inventory management practices and supply chain performance in dairy processing firms in Kiambu County, using a descriptive research design and targeting three dairy firms with a census sample of 96 respondents. Reliability was tested using Cronbach's alpha, and data analysis involved descriptive statistics and multiple linear regression models. The study found that lean inventory practices significantly affect supply chain performance. While both studies examine the relationship between inventory management and supply chain performance, Ndiwa's research focused on dairy processing firms, whereas the current study investigates county governments in Western Kenya.

Shajema (2018) studied the impact of inventory control practices on the performance of retail chain stores in Nairobi County, Kenya, revealing that lean practices have a positive and significant effect on store performance. The study employed a descriptive survey design, targeting all 144 retail chain stores in Nairobi County and collecting data through structured questionnaires. The findings indicated that vendor management inventory systems and lean inventory practices

significantly enhance store performance. The study recommended that firms handling inventories invest in improving lean practices. In contrast, the current research examines the effects of inventory management on county governments in Western Kenya, potentially leading to different outcomes compared to studies conducted in Nairobi County.

These studies highlight the diverse applications and impacts of inventory management practices across different sectors and geographical locations. They emphasize the importance of effective inventory control in enhancing operational efficiency, improving performance, and achieving competitive advantage. However, variations in methodologies and research contexts may lead to nuanced findings and recommendations, particularly when comparing studies conducted in different industries or regions.

2.5 Literature review and gaps

Table 2.1: Summary of literature review

Author (Year)	Study Focus	Methodology	Findings and Knowledge	Research Gaps	Focus of the Current Study
Wafula (2016)	Effect of Inventory Management and Operational Performance in Oil Marketing Companies	Descriptive research design	The research found a positive correlation between inventory management and operational performance.	The research focused on operational performance as the dependent variable.	The current study focuses on supply chain performance in county governments.
Were & Nzioka (2017)	Effect of Inventory Management on Performance of the Education Sector in Kenya	Census survey	Established that Economic Order Quantity (EOQ) helps improve performance in the education sector.	The study focused on the education sector, while the current study focuses on county governments.	The current study investigates the effect of inventory management practices on supply chain performance in county governments.
Okumu & Bett (2019)	Effect of Inventory Management and Organizational Performance	Descriptive research design	The research found a positive and significant relationship between Economic Order Quantity (EOQ) and organizational performance in manufacturing companies.	The research was carried out in manufacturing companies, with organizational performance as the dependent variable.	The current study addresses the gap in inventory management practices and performance in county governments, rather than manufacturing.
Khalid & Lim (2019)	Effect of Inventory Management in Small and Medium-	Descriptive research design	Established that an increase in vendor-managed inventory	The research was focused on manufacturing	The current study will focus on the public sector, specifically

Author (Year)	Study Focus	Methodology	Findings and Knowledge	Research Gaps	Focus of the Current Study
	Sized Manufacturing Companies		(VMI) leads to improved operational performance in consumer goods manufacturing.	companies, which creates a gap in understanding inventory management practices in the public sector.	county governments.
Shanjema (2018)	Effects of Inventory Management Practices and Supply Chain Performance in Health Facilities in Kisumu County	Descriptive survey design	Found that structural inefficiencies in supply chains impact performance. Lean inventory practices had a positive effect on inventory control.	The study was focused on health facilities in Kisumu County, whereas the current study looks at county government supply chains more broadly.	The current study examines the impact of inventory management practices on supply chain performance in county governments in Kenya.
Kariuki (2017)	Effect of Inventory Practices on Performance of Retail Chain Stores in Nairobi County	Descriptive design	Found that Just-In-Time (JIT) improved communication and relationships, thereby improving efficiency.	The research focused on retail chains in Nairobi County, creating a gap in understanding inventory management in county governments.	The current study focuses on inventory management practices in the context of county governments, particularly on supply chain performance.
Kinyua (2014)	Inventory Management, Practices, and Performance in Consumer Goods	Descriptive design	Established that Just-In-Time (JIT) inventory practices significantly increased operational	The research was carried out in consumer goods firms, creating a gap in understanding how	The current study investigates the effect of inventory management on supply chain

Author (Year)	Study Focus	Methodology	Findings and Knowledge	Research Gaps	Focus of the Current Study
	Firms in Nairobi, Kenya		performance in consumer goods firms.	JIT influences county government supply chains.	performance within county governments.
Mulandi & Ismail (2019)	Impact of Inventory Management Practices on the Performance of Commercial State Corporations in Kenya	Census method	Both Just-In-Time (JIT) and Materials Requirement Planning (MRP) showed positive relationships with the performance of state corporations.	The research was conducted on commercial state corporations, unlike the current study, which focuses on county governments.	The current study focuses on county governments, not state corporations, in evaluating inventory management practices.
Muchaependi, Mbohwa, Hamadishe & Kanyepe (2019)	Inventory Management Practices and Performance in SMEs in Harare, Zimbabwe	Qualitative research design (descriptive in nature)	The majority of SMEs utilized the Just-In-Time (JIT) inventory system but lacked awareness of other computerized systems.	The study was conducted in SMEs, which creates a gap in understanding how inventory management practices affect county government operations.	The current study explores the effect of inventory management practices on supply chain performance in county governments in Kenya.

Source: *Reviewed Literature*

2.6 Conceptual Framework

A conceptual framework elucidates the relationships between study variables, offering a visual representation of these associations (Jabareen, 2009). According to Mugenda (2018), it involves presenting study variables in a diagram, facilitating clearer comprehension of the research. Fundamentally, a conceptual framework explores the connections that link independent variables with the dependent variable, helping to structure and interpret the research findings effectively.

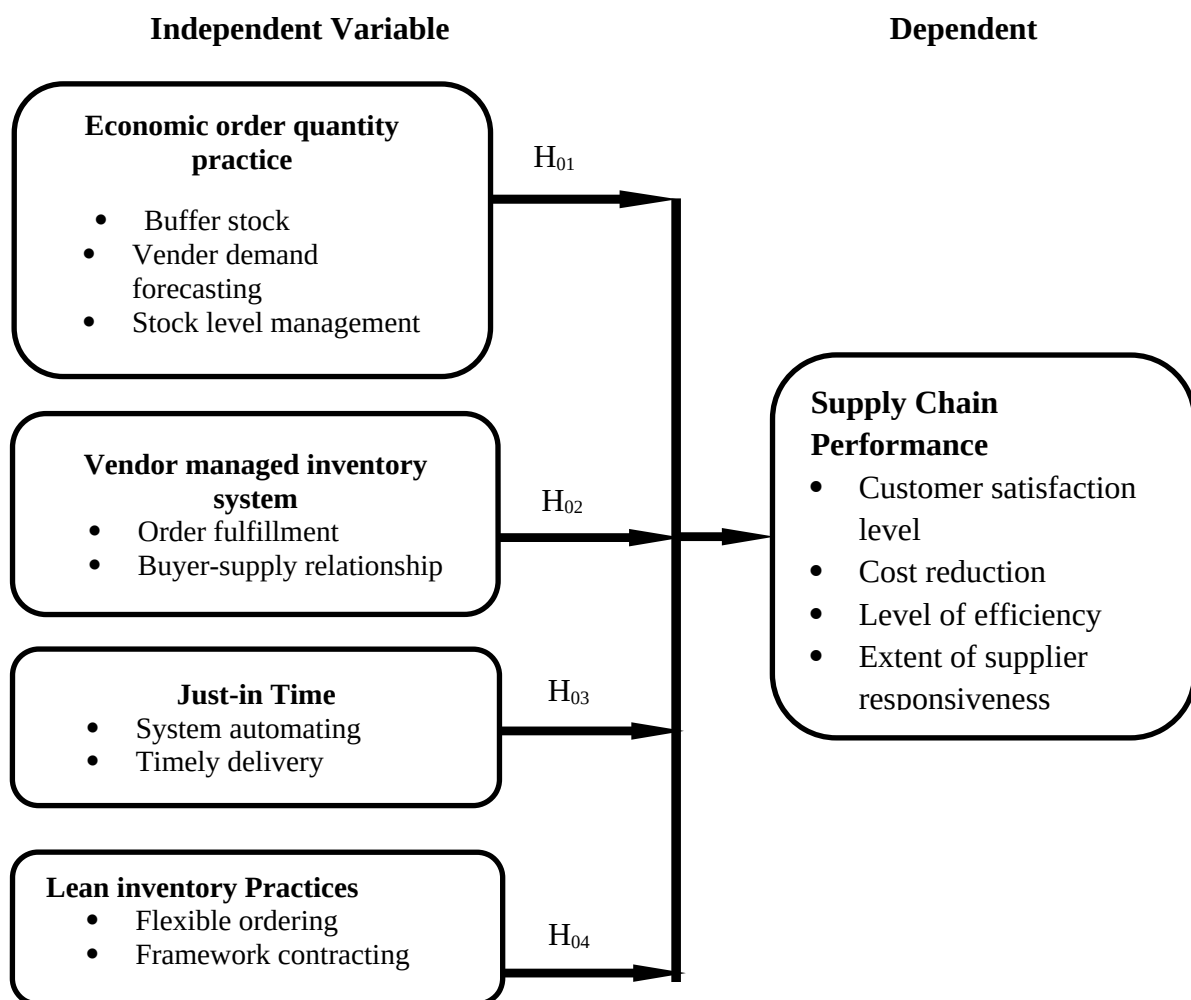


Figure 2.1: Conceptual Framework

Adapted from other studies (Muchaependi at al, Mbohwa, Hamadishe & Kanyepe, 2019; Kaligirwa, 2018; Nzioka & Were, 2017, Hussein & Makori, 2018; Musau, Namusonga, Makokha & Ngeno, 2017).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deliberates on research design, study population, data collection process and finally the process of data analysis with the gears that were employed in both data presentation and analysis.

3.2 Study area

This study was conducted across four county government offices in Kenya's Western Region: Kakamega, Busia, Bungoma, and Vihiga, with a pilot study in Kisumu County Government. Each county has unique geographical locations and coordinates. For example, Kakamega is positioned at a latitude of 0°17'0"N and a longitude of 34°45'0"E; Bungoma is located at latitude 0°34'10.29"N and longitude 33°33'30.1572"E; Vihiga has coordinates of latitude 0.081588°N and longitude 34.722935°E, with a GPS coordinate of latitude 0°02'60.00"N and longitude 34°43'17.99"E. Lastly, Busia is situated at latitude 0.4344651° and longitude 34.24216°, with a GPS coordinate of latitude 0°25'59.99"N and longitude 34°08'60.00"E.

3.3 Research Philosophy

The research philosophy most suited for this study is positivism, as it aligns with the objective of evaluating the impact of inventory management practices on supply chain performance in county governments in Kenya's Western Region. According to Park *et al.* (2020), positivism is grounded in the belief that knowledge should be derived from observable and measurable phenomena, seeking to identify relationships between variables

through objective, quantitative analysis. Since the study focuses on assessing the effects of specific inventory management practices—such as Economic Order Quantity, Vendor-Managed Inventory, Just-In-Time, and Lean practices—on supply chain performance, a positivist approach is appropriate. This approach emphasizes empirical data and statistical analysis to test hypotheses and establish cause-and-effect relationships (Maretha, 2023; Ryan, 2018).

Moreover, the study's reliance on evaluating predefined variables, such as the use of inventory practices and their direct effect on supply chain outcomes, strengthens the case for a positivist framework. As Alakwe (2017) suggests, positivism emphasizes that knowledge should be based on measurable data that can be tested and verified through quantitative methods. The researcher would collect and analyze quantitative data, likely through surveys or secondary data, to assess the impact of each inventory management practice on supply chain performance. The ultimate aim is to generalize the findings to other county governments within the region, a goal that fits well within the positivist paradigm, which prioritizes the identification of universal laws or patterns based on empirical evidence (Wangari & Kagiri, 2015).

Alternatively, a **post-positivist** philosophy could also be considered, particularly if the researcher acknowledges that there are limitations to fully capturing all the complexities influencing supply chain performance. Darby *et al.* (2019) argue that while post-positivism still emphasizes empirical measurement, it recognizes that research findings are not absolute and may be subject to revision or influenced by factors beyond the study's scope. Towers *et al.* (2020) similarly note that this perspective would allow the researcher to appreciate the nuanced, sometimes unpredictable, nature of supply chains, where various external factors

might affect the outcomes. While the research design would still involve quantitative methods, post-positivism allows for a more flexible interpretation of the results, understanding that findings may offer probabilistic insights rather than definitive conclusions.

A positivist or post-positivist research philosophy aligns with the study's objectives of examining the relationship between inventory management practices and supply chain performance. These philosophical approaches support the use of quantitative methods to analyze measurable data, test hypotheses, and draw conclusions that can potentially be generalized across similar contexts (Ryan, 2018; Alakwe, 2017). The focus on objective measurement and statistical analysis to evaluate the effects of inventory management practices makes positivism the most suitable research philosophy for this study (Maretha, 2023; Park *et al.*, 2020).

3.4 Research design

The study adopted both descriptive survey and Correlation research design. The descriptive research design was manifested through the use of mean, percentages, standard deviations and standard error and results presented through tables, charts, and graphs while the Correlation research design was manifested through the use of simple linear regression, Pearson correlation and multiple regression. The adopted descriptive survey design was deemed suitable for examining statistical relationships between variables and making predictions based on the collected data (Kothari, 2011). Bernard (2017) described it as a blueprint that outlines the methods for data collection and analysis. Patten and Newhart (2017) noted that descriptive survey design is often used in primary studies, aiding in the collection and clear summarization of findings. Coolican (2017) also emphasized that this

design is particularly effective for exploring the "what," "why," and "how" of a phenomenon. Consequently, the descriptive survey design was chosen and justified for its effectiveness in clarifying current inventory management practices within county governments and their impact on performance.

3.5 Target population

"Population" refers to the entire group of items that a study is primarily concerned with (Patten & Newhart, 2017). It includes the set of occurrences that the researcher aims to investigate. In this study, the focus was on purchasing, stores, and quality assurance staff and the staff was selected through purposive sampling as outlined in Table 3.1.

Table 3.1: Target Population

Target Population (Category per County)	Purchasing Staff	Store Staff	Quality Assurance Staff	Total Target Population
Kakamega	19	8	5	32
Bungoma	21	9	4	34
Busia	15	8	3	26
Vihiga	17	7	4	28
Total	72	32	16	120

Source: Respective County Government Offices (2024)

3.6 Sampling Design

Sampling refers to selecting a subset of the population to represent the entire group. Kombo and Tromp (2016) define sampling design as the method used to select representative elements from the population to include in the study, where one or more

subjects are chosen to serve as representative samples. Census study was adopted due to the limited number of employees in the County Governments of the Western Region, Kenya. According to Surbhi (2017) census involves a systematic approach to collecting and recording data from every member of the population, while. The researcher also used purposive sampling technique in selecting the staff to act as the respondents in the study.

3.7 Sample Size

The sample size was 120 calculated using Yamane's (1967) formula. The sample size was distributed proportionally to each County Hospital.

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

$$n = 120 / (1 + (120 * (0.05)^2))$$

$$n = 92.3$$

However, it is advised that when the sample size is considered too small, the research can use census approach (Hicks *et al.*, 2017; Ngei & Kihara, 2017), hence, the sample size of 120 was used for this study.

Where;

n = Sample

N = Total population of the area under study

1 = 1 is constant

e = error limit or margin of error. It's usually accepted at 5% or 0.05.

3.8 Pilot Study

Simkus (2023) pilot study is a small-scale initial study done before the key research purposely to check the feasibility or advance the research design. A pilot study was key as it helped the researcher design the research methods and protocol before conducting a full-scale research project. Before data collection, the researcher carried out a pilot study in Kisumu County as the choice proposed being that Kisumu County fall within the Western region and there is likelihood of bearing some identical characteristics with other Counties of Study. This was done by administering twelve questionnaires to respondents a representation of 10% of the sample size. The pilot test was used specifically to eliminate any ambiguities that could confusing in statements or instructions, and to ascertain whether the language used is clear, understandable and concise. During the pilot-testing stage, the researcher elaborated understanding of each question and highlighted possible weaknesses in the questionnaire. Based on responses, the questionnaire were amended to reflect the suggested corrections. In so doing, validity was achieved. In addition, as suggested by Rowley (2002), the questions in the questionnaire Were closely linked to the original research questions to further ensure that construct validity is achieved.

3.8.1 Validity of the Instrument

Roberta, Heale and Twycross (2015) validity refers to how well the data measures what it is supposed to measure. Validity is key in research work as it shows if the characteristics being measured by a test is related to job qualification and requirement (Twycross, 2015). Experts authenticates validity of the instruments (Kothari ,2012).Sample size and item validity was determined prior to the actual investigation in the present study. Questionnaire content validity was determined by consulting with the two assigned experts in improving it. To

that end, they examine the instrument and made suggestions for improvements (Matula, 2018).

3.8.2 Reliability of the Instruments

Heale and Twycross (2015) reliability refers to how consistent and accurate the data is across different situations and source or it simply means the consistency of a measure. Loyal (2016) reliability is important as it addresses the overall consistency of a research study's measure and therefore both reliability and validity shouldn't be viewed as independent qualities. To enhance reliability, the researcher computed Cronbach's Alpha Coefficient to determine the internal consistency of the items in the questionnaire (Cronbach, 1951). According to Yin (2017), the Alpha coefficient ranges in value from 0 to 1 and the higher the score, the more reliable the questionnaire will be, a score of 0.7 indicates acceptable reliability. This statistic was used as the study's reliability baseline.

3.9 Data Collection Procedure.

The researcher obtained an approval letter from the university as well as NACOSTI letter before undertaking the research. The researcher used four research assistants to aid in data collections where each assistant represented a county. Data was collected using by drop and pick method.

3.10 Data Collection Instruments

Main data collection instruments used were questionnaires as defined by Borg and Gall (1989) as "any form used to gather input from respondents on identical items." In this study, the researcher utilized questionnaires as the primary tool for collecting primary data.

According to Creswell (2017) primary data is original information collected firsthand. The questionnaires were structured in format, facilitating standardized responses across all participants. This structured approach streamlined the coding process during data analysis using software tools. The rationale behind employing questionnaires was to ensure each respondent received the same set of questions, thereby optimizing the efficiency of data collection prior to analysis (Saunders, 2003).

The questionnaires were designed on a five-point Likert scale for the closed-ended questions. They were used to gather accurate and consistent information from the respondents. Data collection instrument used was designed into three parts where part A had questions about respondents' backgrounds, part B containing questions about inventory management practices while part C containing questions pertaining supply chain performance.

3.11 Data Analysis

Data was analyzed using both descriptive and inferential statistics, which included simple linear regression, Pearson correlation, and multiple regression. The results were then displayed in charts, tables, and graphs. Beers (2023) notes that regression analysis is a statistical technique commonly used to identify and quantify relationships between variables in data. It can reveal the strength of these relationships and determine their statistical significance (i.e, whether the relationships are likely due to chance). Regression is a robust tool for statistical inference and is often employed to predict future outcomes based on historical data.

Consequently, the regression model was as follows:

$$Y = \beta_0 + \beta_1 x_1 + \epsilon \text{ -----(i)}$$

$$Y = \beta_0 + \beta_2 x_2 + \epsilon \text{ -----(ii)}$$

$$Y = \beta_0 + \beta_3 x_3 + \epsilon \text{ -----(iii)}$$

$$Y = \beta_0 + \beta_4 x_4 + \epsilon \text{ -----(iv)}$$

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \epsilon \text{ -----(v)}$$

Where:

Y = Supply chain management performance

β_0 = Y intercept when x is zero (Constant)

$\beta_1, \beta_2, \beta_3$ and β_4 = Regression Coefficients

$x_1 \dots x_n$ = Independent variables

x_1 = Economic Order Quantity

x_2 = Vendor management inventory system

x_3 = Just-In-Time

x_4 = Lean Inventory practices

ϵ = Error

3.11.1 Diagnostic tests

Regression models, like all statistical models, are based on certain assumptions. These assumptions are crucial as they influence the accuracy of estimates and the reliability of outcomes. Below are the assumptions specific to the regression model used in this study.

3.11.1.1 Multicollinearity test

Multicollinearity refers to the condition where independent variables in a regression model

are highly correlated with each other (Lucy, 2018). Managing multicollinearity is crucial in multiple regression analysis due to its potential to affect the reliability of estimates.

To address multicollinearity, a threshold was set at a maximum Variance Inflation Factor (VIF) value of 5 (Ringle, Sven & Michael, 2015). VIF values above 5 indicate moderate to severe multicollinearity, which can distort the interpretation of regression coefficients. In this study, both correlation coefficients and VIFs were examined to assess multicollinearity.

Upon examining the VIFs, it was found that none of the independent variables exhibited VIF values exceeding 5, indicating that multicollinearity was not a significant concern (Ringle, Sven & Michael, 2015). Additionally, tolerance statistics were all above 0.1, further confirming the none existence of multicollinearity amongst independent variables in regression model.

3.11.1.2 Homoscedasticity Assumption

Homoscedasticity is the assumption that the variance of the dependent variable is consistent across all levels of the predictor. It's an important assumption for multivariate analysis as it ensures the reliability of statistical tests and the interpretation of results. Levene's test was employed for homoscedasticity test.

3.11.1.3 Linearity Assumptions

According Tabachnick and Fidell (2013) linearity assumption refers to an assumption where there is a straight-line association between two variables. To assess the extent of the linear relationship, P-P plot was utilized. The assumption of linearity allows for an accurate estimation of the association amongst the dependent and independent variables.

3.11.1.4 Normality Assumptions

According to Mishra (2019) defines this test as a test used to determine whether sample data has been drawn from a normally distributed population. Regression purports that variables trail a normal distribution.

3.12 Ethical Consideration

After obtaining a clearance letter from the university's Research Ethics Committee, convened by the Directorate of Postgraduate Studies, the researcher proceeded with obtaining the necessary research permit from the National Commission for Science, Technology, and Innovation (NACOSTI), in line with the application requirements set by the commission. Once these permissions were granted, the researcher sent official requests to the county governments within the Western Region of Kenya, and also engaged directly with key respondents, seeking their informed consent before proceeding with the primary data collection.

The informed consent form clearly outlined the purpose of the study, the procedures involved, as well as the potential risks and benefits of participating in the research. Participants were informed that their involvement was voluntary, and they were free to withdraw from the study at any stage without any repercussions. They were assured that all information collected would be kept confidential, and that no personal data would be shared outside the scope of the academic study. The researcher took all necessary precautions to safeguard the privacy and anonymity of participants, ensuring that their responses would not be linked to their identities in any published material.

Additionally, the researcher ensured that no personal or sensitive information would be disclosed, and the data collected was to be used exclusively for academic purposes related to the study on inventory management practices and supply chain performance in county governments. Participation in the research was entirely voluntary, and participants were fully informed of their right to withdraw at any

point without facing any consequences. Clear and transparent communication was maintained throughout the study, ensuring participants understood how their information would be used and that their privacy would be respected.

Throughout the data collection process, the researcher also made efforts to minimize any potential risks or discomfort for the participants. Steps were taken to avoid any physical, emotional, or psychological harm, with the researcher remaining sensitive to the possible impact the research may have on participants. Ethical principles of fairness, non-discrimination, and respect for the rights of participants were upheld.

Cultural sensitivity was also prioritized during the study. As the research involved participants from various county governments, the researcher took care to respect local customs, traditions, and values, particularly when interacting with respondents from different communities. The study was conducted with integrity, ensuring that the findings were accurately reported, and potential conflicts of interest were disclosed. The ethical conduct of this research ensured a transparent, inclusive, and responsible approach, building trust between the researcher, the county governments, and the respondents.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the research that was conducted to test both the conceptual model and research hypotheses. First, it provides the response rate, reliability and validity of the research constructs. Secondly, it describes the general background information of the respondents and descriptive analysis of the study variables. Finally, the chapter describes the results of statistical analyses to test the hypotheses and at the same time presents the discussions of the results and conclusions from the findings.

4.2 Response Rate

The study distributed questionnaires to 120 respondents and successfully collected 118 data from participants, resulting in a response rate of 98.33%. There were 2 unused questionnaires, accounting for 1.67%. Reasons for these unused questionnaires were as a result of misplaced questionnaires by the respondent. Despite these instances, the response rate was considered satisfactory, aligning with Field's (2013) suggestion of a minimum 75% response rate as a rule of thumb.

Table 4.1: Response Rate

Response	Frequency	Percentage
Number of valid responses	118	98.33%
Invalid responses	2	1.67%
Total	120	100.00%

Source: Field data (2024)

4.3 Pilot Study Results

The questionnaire tool underwent a pilot study to assess its reliability. Purposive sampling technique was used to select respondents which included 12 respondents selected from supply chain, stores, and quality assurance staff of Kisumu County government, representing 10% of the sampled respondents. The results of the pilot study are presented in Table 4.2.

Table 4.2 Results of Reliability Test

Result Objective			Cronbach's Alpha	No of Items
Supply	chain	Performance	0.87	5
Economic Order Quantity practice			0.91	9
Vender Managed Inventory System			0.87	7
Just- In -Time			0.86	6
Lean Inventory Practices			0.84	7

Source; Field Data (2024)

Reliability coefficients were as follows: Supply Chain Performance (0.879), Economic Order Quantity (0.918), Just In Time (0.800), Vendor Managed Inventory System (0.871), and Lean Inventory Practices (0.845) using Cronbach's alpha test of reliability. Based on Sekaran and Bougie (2011), a Cronbach's alpha of 0.7 and above is considered good, suggesting that the data collected was reliable for further variable analysis. To ensure instrument validity, the study consulted the university supervisor and a procurement expert. Content validity was also upheld by ensuring that the instruments accurately measured the intended variables.

4.4 Demographic Characteristics of the Respondents

The study aimed to gather general information from the respondents, focusing on their category, years of experience and highest educational level. The findings are detailed in Table 4.4.1 to 4.4.2 below:

4.4.1. Distribution of Respondents by Years serving in the counties.

Respondents specified their years of experience in county government to gauge their familiarity in the field thus ensuring the validity of their responses. Findings presented in Table 4.3.

Table 4.3: Respondents’ years of experience

Year of Experience	Frequency	Percent
Less than 2 years	11	9.3
2-5 years	52	44.1
6-10 years	49	41.5
Over 10 years	6	5.1
Total	118	100.0

Source; Field Data (2024)

Study revealed that 9.3% of respondents had less than 2 years of experience in the county, while 44.1% had between 2 to 5 years. Another 41.5% had been employed for 6 to 10 years, and 5.1% had more than 10 years of experience. These results suggest that the respondents possessed sufficient experience to provide informed responses to the study's questions.

4.4.2. Distribution of Respondents by Highest Education Level

Respondents specified their level of education, aimed at evaluating their skill levels and

determining their ability to accurately complete the questionnaire. The findings are detailed in Table 4.4.

Table 4.4: Distribution of Respondents by Education Level

Education Level	Frequency	Percent
Cert	7	5.9%
Dip	47	39.8%
Degree	51	43.2%
Post Grad	13	11.0%
Total	118	100.0%

Source; Field Data (2024)

Study revealed that 43.2% of respondents had a degree followed by 39.8 who a diploma 11.0% were post graduate and lastly 5.7% of the respondents had a certificate. These results suggest that the respondents possessed sufficient education to provide informed responses to the study's questions.

4.5 Descriptive Statistics

The following section presents descriptive statistics relevant to the study's objectives. Mean, standard deviation, and variance were employed as descriptive measures. Mean values were evaluated using Aggresti's (2009) criteria: 1.00 to 2.49 indicates very weak, 2.50 to 3.49 denotes weak, 3.50 to 4.49 signifies strong, and 4.50 to 5.00 suggests very strong. Standard deviation values greater than 0.5 indicate homogeneity, whereas values less than 0.5 indicate heterogeneity of the data.

4.5.1 Economic Order Quantity

The study sought to examine the respondent's level of agreement on statements on economic order quantity. The study findings were presented in Table 4.5

Table 4.5: Descriptive Statistics on Economic Order Quantity

No.	Statements on Economic order quantity	Percentage (Frequency)					Mean	SD
		1	2	3	4	5		
1	County has greatly reduced the buffer (excessive) stock level.	0 (0%)	0 (0%)	18 (15.3%)	47 (39.8%)	53 (44.9%)	4.29	0.71
2	My county strike a balance between ordering cost and in choosing quantity of goods to be purchased	0 (0%)	0 (0%)	1 (12.7%)	48 (40.7%)	55 (46.6%)	4.33	0.69
3	My county engages in demand forecasting which aids in determining when goods/services will be required.	0 (0%)	0 (0%)	13 (11.0%)	50 (42.4%)	55 (46.6%)	4.35	0.67
4	My county monitor's stock levels frequently.	0 (0%)	0 (0%)	12 (10.2%)	39 (33.%)	67 (56.8%)	4.46	0.67
5	My county determines in advance the quality of goods to be purchased	0 (0%)	0 (0%)	12 (10.2%)	39 (33.1%)	67 (56.8%)	4.4 6	0.67
6.	My County determines in advance the period when to make an order.	0 (0%)	0 (0%)	9 (7.6%)	44 (37.3%)	65 (55.1%)	4.47	0.63
7	My county determines in advance services required.	0 (0%)	0 (0%)	15 (12.7%)	37 (31.4%)	66 (55.9%)	.43	0.70
8.	My county avoids scenarios where there is stock out.	0 (0%)	0 (0%)	15 (8.5%)	39 (38.1%)	64 (53.4%)	4.4 1	0.70
9	My County uses store ledgers and stock control cards in managing inventories.	0 (0%)	0 (0%)	15 (12.7%)	39 (33.1%)	64 (54.2%)	4.41	0.70
	Aggregate Scores						4.41	0.68

Source; Field Data (2024)

The survey findings shows strong agreement among respondents on various aspects of supply

chain management in county government. Specifically, (44.9% and 39.8%) strongly agreed and agreed respectively that their county had significantly reduced excessive stock levels. Similarly, a majority 46.6%= strongly agreed and 40.7% =agreed indicated that their county balances ordering cost with the quantity of goods purchased, highlighting the importance of economic order quantity. Additionally, a significant number 46.6% =strongly agreed and 42.4%= agreed acknowledged their county's use of demand forecasting to determine when goods and services are needed.

In terms of stock monitoring and procurement decisions, majority of 56.8% =strongly agreed reported that their county frequently monitors stock levels and decides on the quality and timing of purchases in advance. Furthermore, most respondents (55.1% strongly agreed) stated that their county plans the timing of orders in advance.

The survey yielded an overall mean score of 4.41 and an average standard deviation of 0.68, indicating a generally positive perception of Economic Order Quantity (EOQ) among the surveyed counties. This suggests a strong adherence to effective supply chain practices.

These results are consistent with previous research, such as Atnafu and Balda's (2018) study on EOQ's impact on the competitive performance of small and micro enterprises in Ethiopia, which found a positive relationship between EOQ and organizational performance. The findings also align with those of Were & Nzioka (2017), who demonstrated that EOQ positively impacted performance in the education sector in Kenya. Additionally, Okumu and Bett (2019) found a significant and positive correlation between EOQ and organizational performance in the steel industry in Nairobi County.

4.5.2. Vendor Managed Inventory

The study aimed to evaluate respondents' agreement with statements on the vendor management inventory system. Detailed in Table 4.5.

Table 4.6: Vendor Management Inventory System

No.	Statements on Vendor Managed Inventory	Percentage (Frequency)					Mean	SD
		1	2	3	4	5		
1	The supplier makes re- supply decision on behalf of the county as a result of being aware of stock levels.	0 (0%)	0 (0%)	20 (16.9%)	66 (55.9%)	32 (27.1%)	4.10	0.65
2	My county update its suppliers on stock	0 (0%)	0 (0%)	18 (15.3%)	70 (59.3%)	30 (25.4%)	4.10	0.63
3	My county enjoys a cordial relation with its suppliers.	0 (0%)	0 (0%)	22 (18.6%)	51 (43.2%)	45 (38.1%)	4.19	0.73
4	My county enjoys a good buyer-supplier relationship.	0 (0%)	0 (0%)	18 (15.3%)	50 (42.4%)	50 (42.4%)	4.27	0.71
5	Suppliers use information provided by the county to fulfill orders.	0 (0%)	1 (0.8%)	24 (20.3%)	40 (33.9%)	53 (44.9%)	4.22	0.79
6.	My county Share information with suppliers regarding inventory status	0 (0%)	0 (0%)	17 (14.4%)	51 (43.2%)	50 (42.4%)	4.26	0.68
Aggregate Scores							4.19	0.70

Source; Data (2024)

In response to the question of whether the supplier makes re-supply decisions on behalf of the county based on awareness of stock levels, the results are as follows:(7.1%, 55.9% and 16.9%) of respondents strongly agreed, agreed, and fairly agreed respectively. Regarding the

question of whether my county updates its suppliers on stock results were as follows: (25.4% 59.3% and 15.3%) of respondents strongly agreed, agreed and fairly agreed. As for the question of whether my county enjoys a good relationship with its suppliers, 38.1%=strongly agreed, 43.2%=agreed and lastly 18.6%= fairly agreed.

The question of whether my county enjoys a good buyer-supplier relationship resulted in 42.4% strongly agreeing, 42.4% agreeing, and 15.3% fairly agreeing. In response to the question of whether suppliers use the information provided by the county to fulfill orders, 44.9% =strongly agreed, 33.9%= agreed, 20.3% =fairly agreed and 0.8%=disagreed. Regarding the question of whether my county shares information with suppliers regarding inventory status, 42.4% of respondents strongly agreed, 43.2% agreed, and 14.4% fairly agreed. These respondents believed that the vendor-managed inventory system had a positive and significant impact on supply chain performance.

The mean score of 4.19 with a standard deviation of 0.70 indicates a positive disposition towards the vendor-managed inventory system among the surveyed counties. These findings are consistent with the research conducted by Khalid and Lim (2018) on inventory management practices and operational performance in manufacturing firms in Asia, which established that the vendor-managed inventory system has a positive influence on operational performance. They also align with the research conducted by Ngei and Kihara (2017) on the effect of inventory management systems on the performance of gas manufacturing firms in Nairobi City County, which revealed that vendor-managed inventory significantly predicts the performance of gas firms.

4.5.3 Just-In-Time

The study sought to assess respondent's level of agreement on statements on Just-In-Time.

Table 4.7: Descriptive Statistics on Just-In-Time

No.	Statements on Just-In-Time	Percentage (Frequency)					Mean	SD
		1	2	3	4	5		
1	Automation has made ordering and re-ordering easy	0 (0%)	0 (0%)	24 (20.3%)	45 (38.1%)	49 (41.5%)	4.10	0.65
2	My County uses data to manage inventory	0 (0%)	0 (0%)	15 (12.7%)	48 (40.7%)	55 (46.6%)	4.16	0.63
3	My county orders what is needed at the time it is needed.	0 (0%)	0 (0%)	12 (19.5%)	59 (44.1%)	47 (36.4%)	4.17	0.64
4	My county has been able to free up physical space due to making on demand orders.	0 (0%)	0 (0%)	13 (11.0%)	53 (44.9%)	52 (44.1%)	4.11	0.71
5	There has been timely delivery of goods and services by suppliers in my county.	0 (0%)	0 (0%)	19 (16.1%)	49 (41.5%)	50 (42.4%)	4.32	0.66
6.	There has been quick and easy delivery of services in county due to reliable Suppliers.	0 (0%)	0 (0%)	10 (8.5%)	64 (54.2%)	44 (37.3%)	4.93	0.68
7	My county uses contracts that allows placing orders on need basis to manage its inventory	0 (0%)	0 (0%)	24 (20.3%)	45 (38.1%)	49 (41.5%)	4.23	0.68
Aggregate Scores							4.29	0.66

Source; Field Data (2024)

When asked about the ease of ordering and re-ordering due to automation, the majority of respondents 41.5%= strongly agreed with the statement, 38.1% =agreed and 20.3% fairly

agreed. Regarding the use of data to manage inventory in my county, 39.8%=strongly agreed, 50.0% =agreed, and 10.2% fairly agreed. As for the practice of ordering what is needed at the time it is needed, 36.4% of respondents strongly agreed, 44.1% agreed, and 19.5% fairly agreed. In terms of freeing up physical space through on-demand orders, 44.1% of respondents strongly agreed, 44.9% agreed and 11.% fairly agreed.

When asked about the timely delivery of goods and services by suppliers, the majority of respondents (42.4%) strongly agreed, 41.5% agreed, and 16.1% fairly agreed. The mean score of 4.29 (SDV = 0.66) indicates a generally positive disposition towards efficient Just-In-Time practices among the surveyed individuals. These study findings are consistent with previous research by Kaswan, Rathi, and Singh (2019) in India, which examined the impact of Just-In-Time (JIT) on decision-making in the healthcare sector and found a positive influence on firm performance. Filippini and Forza (2016) also explored the effect of JIT systems on performance, using Indian companies as a case study, and their empirical research revealed a positive correlation between JIT as an inventory management system and supply chain performance.

Similarly, Kariuki (2017) conducted research in Laikipia County to assess the impact of inventory management techniques on firm performance, emphasizing the importance of all firms adopting and implementing inventory management practices, particularly Just-In-Time.

4.5.4 Lean Inventory Practices

The study sought to assess respondents' level of agreement on statements on Lean Inventory Practices Responses were presented in Table 4.8.

Table 4.8: Descriptive Statistics on Lean inventory practices

No.	Statements on Lean inventory practices	Percentage (Frequency)					Mean	SD
		1	2	3	4	5		
1	Stock piling is unnecessary and expensive.	0 (0%)	0 (0%)	14 (11.9%)	63 (53.4%)	41 (34.7%)	4.22	0.64
2	My county considers flexibility in making ordering decisions	0 (0%)	0 (0%)	21 (17.8%)	53 (44.9%)	44 (37.3%)	4.19	0.71
3	My county minimizes waste through lean Practices.	0 (0%)	0 (0%)	20 (16.9%)	49 (41.5%)	49 (41.5%)	4.24	0.72
4	My county has reduced stocks of inventory held on site	0 (0%)	0 (0%)	17 (14.4%)	60 (50.8%)	41 (34.7%)	4.20	0.67
5	My county makes use of contractual provisions when placing orders so as to manage its inventory.	0 (0%)	0 (0%)	10 (8.5%)	59 (50.0%)	49 (41.5%)	4.33	0.62
6.	County government places orders on needs basis.	0 (0%)	0 (0%)	18 (15.3%)	48 (40.7%)	52 (44.1%)	4.28	0.71
7	My county order minimum quantity of required goods where the quantity are not determined at the beginning.	0 (0%)	0 (0%)	25 (21.2%)	42 (35.6%)	51 (43.2%)	4.22	0.77
Aggregate Scores							4.24	0.69

Source; Field Data (2024)

Regarding the question of whether stock piling is unnecessary and expensive, the responses were as follows: 34.7%, 53.4% and 11.9% strongly agreed, agreed, and fairly agreed respectively. As for the question of whether my county considers flexibility in making ordering decisions, 37.3%=strongly agreed, 44.9% =agreed, and 17.8%= fairly agreed.

The question of whether my county minimizes waste through lean practices resulted in a tie between those who strongly agreed and those who agreed, both had 42.4%, while 16.9%=

fairly agreed. In response to the question of whether my county has reduced stocks of inventory held on site results were as follows: 34.7%, 50.8% and 14.4% strongly agreed, agreed, and fairly agreed respectively. Finally, in regards to the question of whether there has been use of contracts that allow placing orders on a need basis to manage inventory, 41.5% =strongly agreed, 50.0% =agreed, and 8.5% =fairly agreed. The mean result indicates a strong mean score of 4.24 (SDV = 0.69), showing a generally positive disposition towards efficient lean inventory practices among the surveyed counties. The study findings are consistent with research by Ndiwa (2022) on the impact of inventory management practices on the supply chain performance of dairy processing firms in Kiambu County, which found that lean inventory practices significantly enhance supply chain performance. Similarly, Shajema (2018) investigated the influence of inventory control practices on the performance of retail chain stores in Nairobi County, Kenya, and identified a positive and significant effect of lean practices on performance.

These findings also align with research by Kihara and Odhiambo (2018), which examined the effect of inventory management practices on the supply chain performance of government health facilities in Kisumu County, Kenya. Additionally, Mukopi and Iravo (2015) explored the impact of inventory management on procurement performance in sugar manufacturing companies, revealing a strong positive relationship between lean inventory systems and procurement performance.

4.5.5. Supply Chain performance

Results that sought to determine respondent's agreement level on statements on Supply Chain performance.

Table 4.9: Supply Chain Performance

No.	Statements on supply chain performance	Percentage (Frequency)					Mean	SD
		1	2	3	4	5		
1	Inventory Management practices has increased customers satisfaction.	0 (0%)	0 (0%)	11 (9.3%)	47 (39.8%)	60 (50.8%)	4.41	0.65
2	Inventory Management practices has led to Cost reduction.	0 (0%)	0 (0%)	14 (11.9%)	34 (28.8%)	70 (59.3%)	4.47	0.70
3	Inventory management practices leads to efficiency.	0 (0%)	0 (0%)	18 (15.3%)	30 (25.4%)	70 (59.3%)	4.44	0.74
4	There are less complaints in regards to goods supplied in the last three years.	0 (0%)	0 (0%)	8 (6.8%)	43 (36.4%)	67 (56.8%)	4.50	0.62
5	Inventory management practices leads to responsiveness.	0 (0%)	0 (0%)	13 (11.0%)	41 (34.7%)	64 (54.2%)	4.43	0.68
Aggregate Scores							4.45	0.68

Source; Field Data (2024)

In terms of whether Inventory Management practices have increased customer satisfaction, the majority of respondents 50.8%=strongly agreed with the statement, 39.8%= agreed, and 9.3%=fairly agreed. Regarding whether Inventory Management practices have led to cost reduction, the majority of respondents (59.3%) strongly agreed, followed by 28.8% who agreed, and 11.9% who fairly agreed.

When it comes to whether Inventory Management practices lead to efficiency, the majority

of respondents 59.3%=strongly agreed, 25.4%=agreed and 15.3%=fairly agreed with the statement that economic order quantity has a positive and significant impact on supply chain performance. In terms of whether there have been fewer complaints about goods supplied in the last three years, 56.8% of respondents strongly agreed, 36.4% agreed, and 6.8% fairly agreed. Additionally, 54.2% of respondents strongly agreed that Inventory Management practices lead to responsiveness, 34.7% agreed, and 11.0% fairly agreed with the statement. The mean results indicate a strong mean score of 4.45 (SDV = 0.68), which suggests a generally positive disposition towards the significance of supply chain performance among the surveyed counties.

Research results are consistent with the study conducted by Mahmudova (2018) where the majority of respondents agreed that inventory management practices have led to cost reduction. Ghadem *et al.* (2016) found that the majority of respondents were in agreement that inventory management practices lead to efficiency. Ghalem, Choqui, Okar & Semma (2017) also found that the majority of respondents agreed that inventory management has increased customer satisfaction. Previous research (Shin Wood & Jun, 2016; Heizer, Render, Munson & Sachan, 2017; Kaligirwa, 2019; Kiboko, 2017; Muchaendepi, Mbohwa, Hamandishe & Kanyepe, 2019; Okumu *et al.* 2019; Hussein & Makori, 2018; Mulandi & Ismail, 2019) has also shown that the majority of respondents concur that inventory management practices have led to cost reduction, increased efficiency, and improved satisfaction levels.

4.5.6 Average means and Standard Deviations of the variables

The below table presents a summary of means and standard deviations of all the study variables (Table 4.10).

Table 4.10: Descriptive Statistics of combined study variables

Variables	Mean	SDV
Economic Order Quantity	4.41	0.68
Just-In-Time	4.29	0.66
Vendor Managed Inventory System	4.19	0.70
Lean Inventory Practices	4.24	0.69
Supply Chain Management	4.45	0.68

Source; Field Data (2024)

Results presented in Table 4.5.6 provides descriptive statistics for all study variables and Supply Chain Performance. These variables represent key aspects of inventory and supply chain management practices within the surveyed entities. The mean scores for each variable indicate the average level of adherence or implementation of the respective practices among the surveyed entities. Across the board, the mean scores suggest a generally positive disposition towards these inventory and supply chain management principles, with scores ranging from 4.19 for VMI to 4.45 for SCM. This indicates a strong inclination towards adopting efficient inventory management strategies and embracing principles aimed at optimizing supply chain performance.

The standard deviations (SDV) associated with each variable reflect the degree of variability in the implementation of these practices among the surveyed entities. While the mean scores suggest a favorable trend towards these practices, the standard deviations highlight deviations from the average within the dataset. These variations could stem from differences in organizational structures, industry dynamics, and levels of expertise in inventory and supply chain management among the surveyed entities. Overall, the data underscores the importance of considering multiple facets of inventory and supply chain management practices to enhance operational efficiency, minimize costs, and drive sustainable business

performance.

4.6 Assumptions of Regression Model

Several regression assumptions were tested which included the assumptions of linearity, normality, heteroscedasticity and multicollinearity as discussed below;

4.6.1 Linearity Assumption

According Tabachnick & Fidell (2013) linearity assumption refers to an assumption where there is a straight-line association between two variables. To assess the extent of the linear relationship, P-P plot was utilized. The assumption of linearity allows for an accurate estimation of the association amongst the dependent and independent variables. Depicted in figure 4.1 – 4.6.

Linearity Assumption For Economic Order Quantity

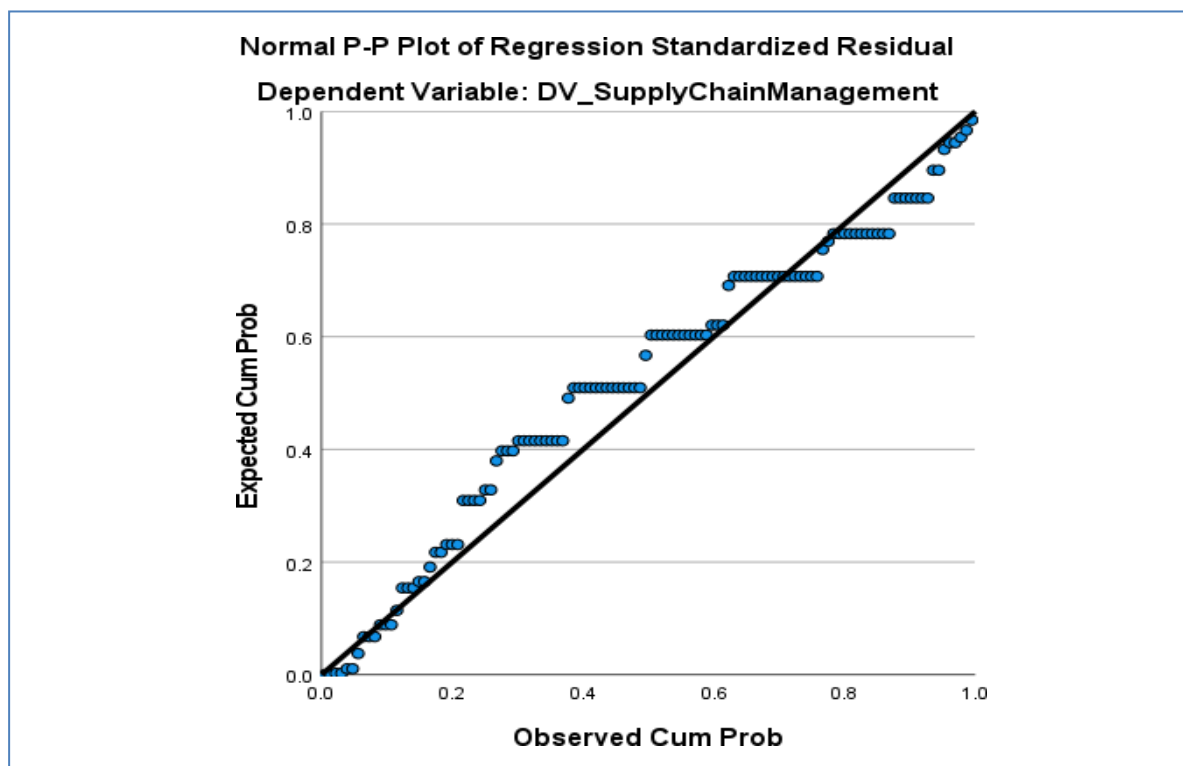


Figure 4.1: P-P Plot for Economic Order Quantity
Source; Field Data (2024)

It is clear that linearity assumption was attained from the above tested variable as the spreading is not tilted on one side but evenly distributed thus a normal P-P is presented in Figure 4.2.

Linearity Assumption For Vendor MIS

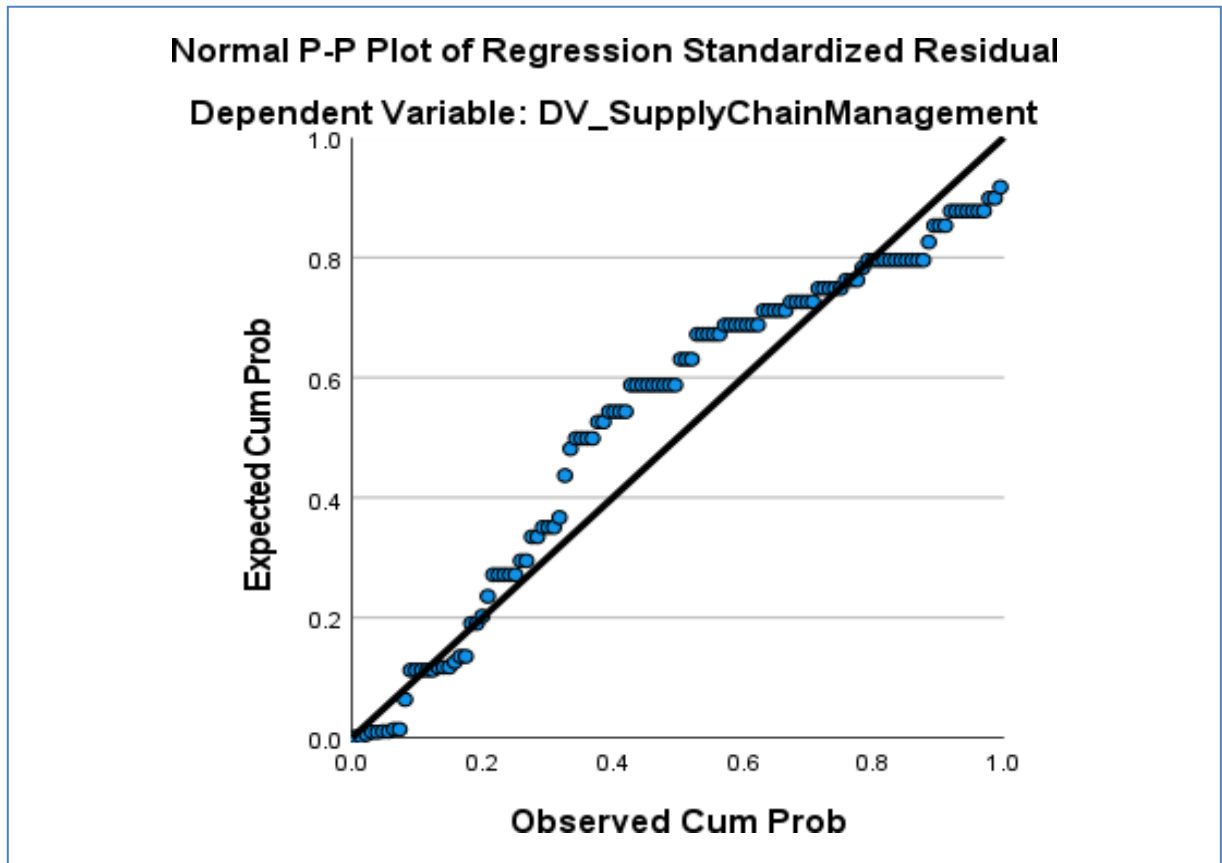


Figure 4.2: P-P Plot for vendor Managed Inventory
Source; Field Data (2024)

It is clear that linearity assumption was attained from the above tested variable as the spreading is not tilted on one side but evenly distributed thus a normal P-P is presented in Figure 4.3

Linearity Assumption For Just-in-Time

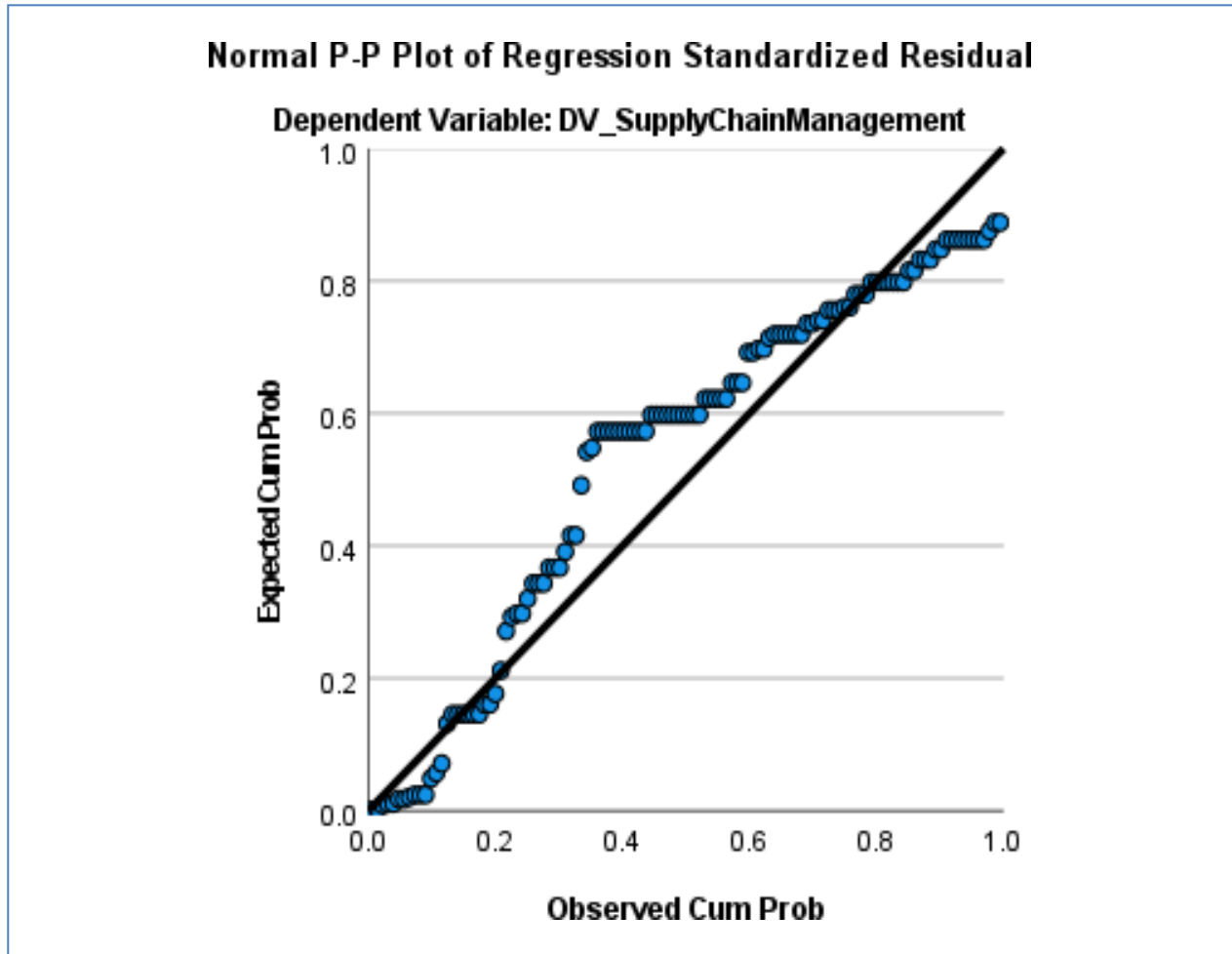


Figure 4.3: Figure 4: P-P Plot for Just-In-Time

Source; *Field Data (2024)*

It is clear that linearity assumption was attained from the above tested variable as the spreading is not tilted on one side but evenly distributed thus a normal P-P is presented as shown in Figure 4.4.

Linearity Assumption For Lean Inventory Practices

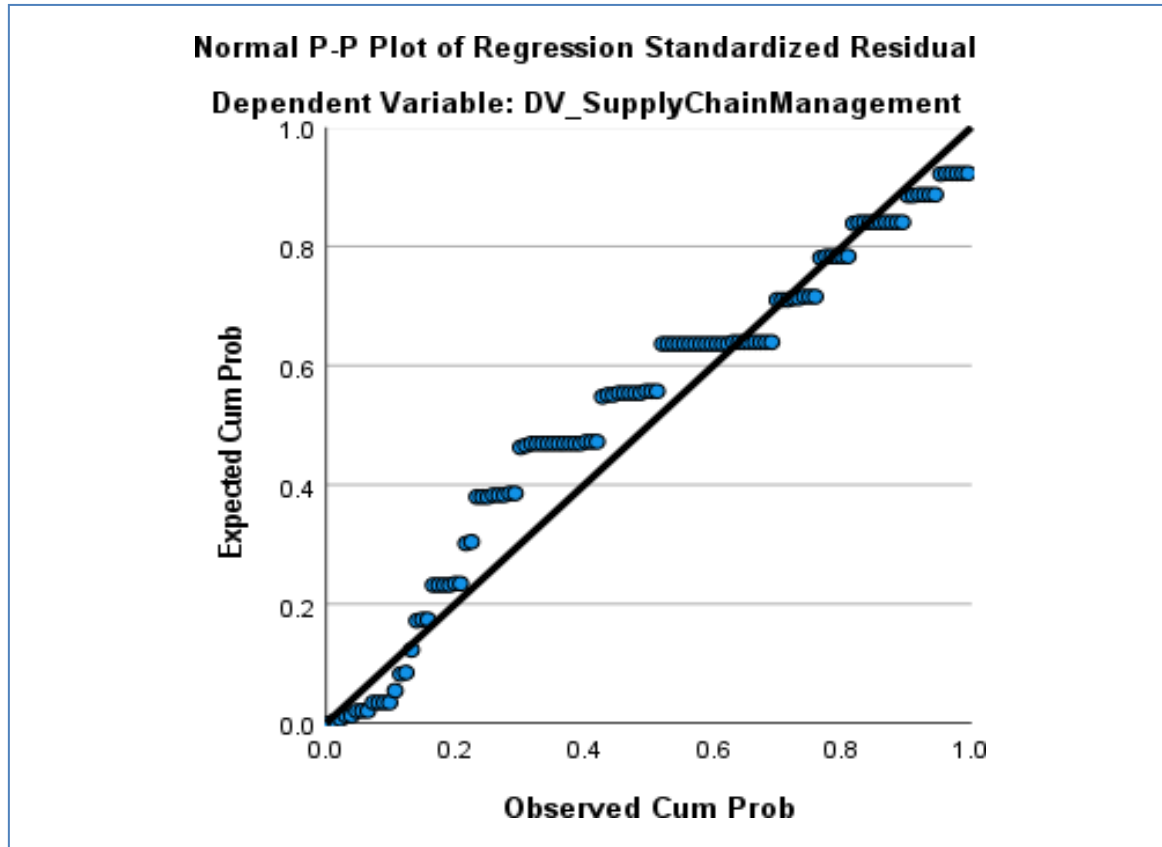


Figure 4.4: P-P Lean Inventory Practices

Source; *Field Data (2024)*

It is clear that linearity assumption was attained from the above tested variable as the spreading is not tilted on one side but evenly distributed thus a normal P-P is presented in Figure 4.5

Linearity Assumption For combined variables



Figure 4.5: P-P Plot for combined variables

Source; *Field Data (2024)*

Findings in Figure 6 showed that the plots in the normal P-P as presented clearly shows a normal distribution along the diagonal line as well as spreading is not tilted on one side .

4.6.2 Normality Assumption

Regression assumes that variables have normal distribution. Non-normally distributed variables can distort relationship and significance tests. The normal distribution is shown from the below variables.

Normality Test for Economic Order Quantity

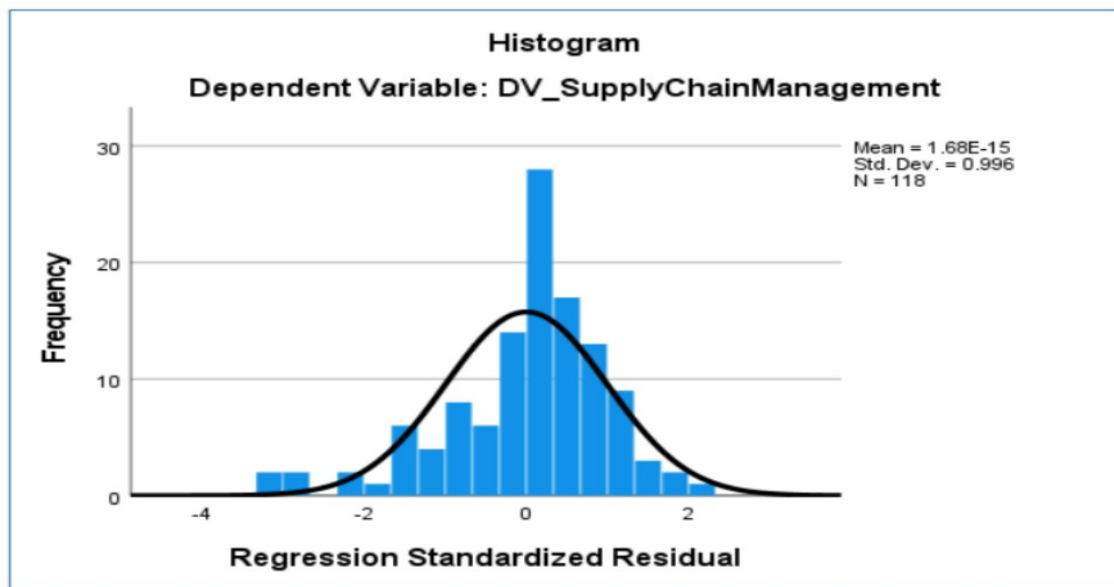


Figure 4.6: Normality Curve for Economic Order Quantity

Source; *Field Data (2024)*

Economic Order Quantity variable met normality requirement as demonstrated in the curve in the Histogram and normality curve in the above Figure 4.6

Normality Test for Vendor MIS

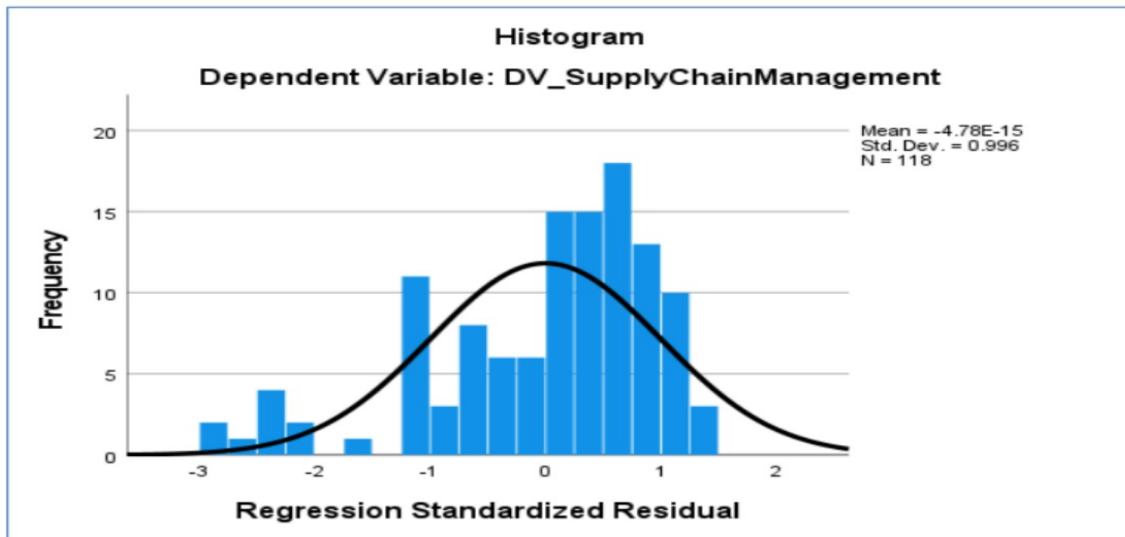


Figure 4.7: Normality Curve for Vendor MIS

Source; *Field Data (2024)*

For Vendor Managed Inventory System the data met normality requirement as demonstrated in the curve in the Histogram and normality curve in the above Figure 4.7

Normality Test for JIT

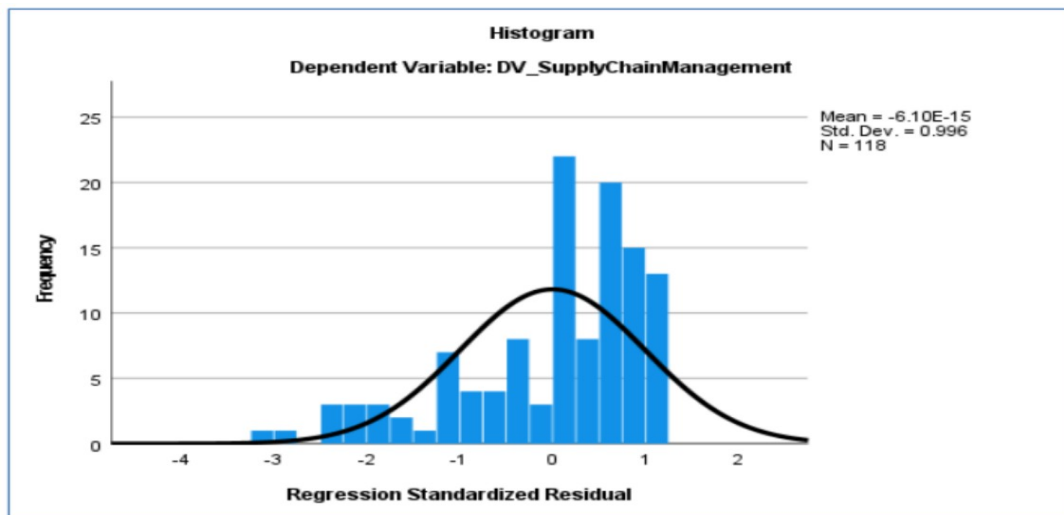


Figure 4.8: Normality Curve for JIT

Source; *Field Data (2024)*

For JIT the data met normality requirement as demonstrated in the curve in the Histogram and normality curve in the above Figure 4.8.

Normality Test for Lean Inventory practices

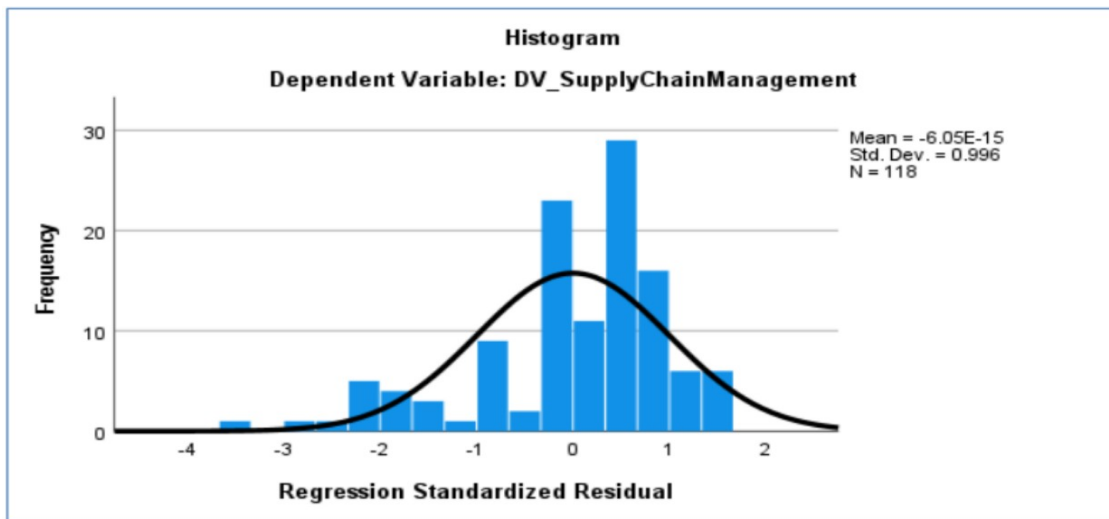


Figure 4.9: Normality Curve for Lean Inventory practices
Source; Field Data (2024)

For the variable above (Lean Inventory practices), data met normality requirement as demonstrated in the curve in the Histogram and normality curve in the above Figure 4.9

Normality Test For Combined Variables

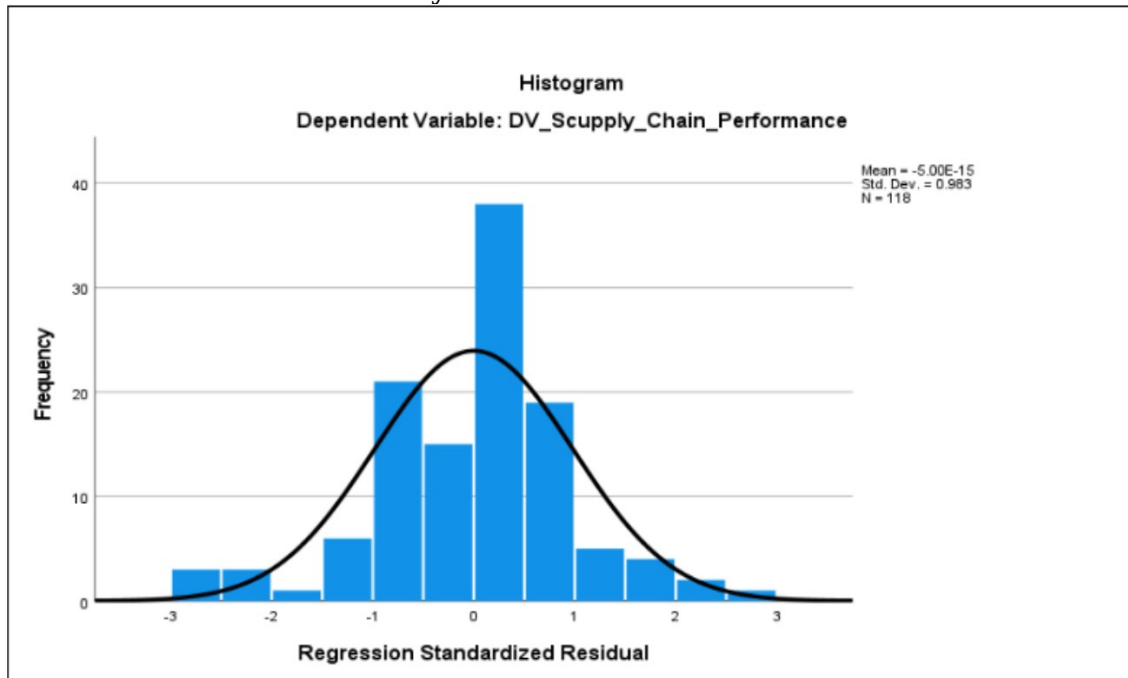


Figure 4.10: Normality Curve for Combined Variables
Source; Field Data (2024)

For the all variables, data met normality requirements as demonstrated by Histogram and normality curve in the above Figure 4.10.

4.6.3. Homoscedasticity Assumption

Homoscedasticity is a fundamental assumption in multivariate analysis. Researcher employed Levene's test to assess homoscedasticity, as shown in table 4.6.2, ensuring that variability in the statistics does not systematically vary with changes in the predictor variables.

Table 4.11: Levene's Test of Equality of Error Variances

F	df1	df2	Sig.
1.341	51	27	.207

Source; Field Data (2024)

Results in table 4.6.3 indicated that ($p > .05$) suggesting a zero significant change in variances across. Therefore, has no evidence of heteroscedasticity in the data.

4.6.4 Multicollinearity Assumption

This assumption asserts for minimal association among IV. For any existence, as noted by Lind, Marchal, and Wathen (2012), normal faults and adjustments of estimated coefficients can be overstated.

The verge for determining the presence of multicollinearity was set at the extreme VIF value of 5, following guidelines by Ringle, Sven, and Michael (2015). A VIF larger than 1 designates aspects of correlation among independent variables whereas a VIF that ranges between 5 and 10 suggests serious multicollinearity, that can pose significant issues. Based on these criteria, the analysis concluded that there was lack of multicollinearity amid the IV,

ensuring the reliability of the regression results .Based on the findings, examination of VIFs indicated that multicollinearity was not an issue. None of the variables exhibited a VIF value exceeding 5, and all tolerance statistics were above .1 (Ringle, Sven & Michael, 2015).It’s therefore concluded that no predictor variables displayed robust linear relationships with each other. These findings are detailed in table 4.12.

Table 4.12: Multicollinearity Test

	Tolerance	VIF
(Constant)		
Economic Order Quantity	.38	2.60
Vendor MIS	.31	3.17
Just In Time	.36	2.78
Lean Inventory Practices	.24	4.05

Source; Field Data (2024)

Multicollinearity results presented in table 4.6.4 provides correlations and respective measures for each independent variable in the study. The findings shows that Economic Order Quantity has a tolerance of 0.38 and a VIF of 2.60, indicating a moderate level of correlation with other variables. Similarly, Vendor Managed Inventory System has a tolerance of 0.315 and a VIF of 3.17, suggesting moderate correlation as well. Just In Time has a tolerance of 0.36 and a VIF of 2.78, while Lean Inventory Practices has a lower tolerance of 0.247 but a higher VIF of 4.05, indicating slightly stronger correlation with other variables.

None of the variables exceeded critical thresholds that would require their exclusion from the analysis due to severe multicollinearity. According to guidelines by Craney and Surles (2002), a VIF greater than 10 or a tolerance below 0.10 would indicate problematic multicollinearity, but this was not observed in our study. Therefore, all independent variables were retained for further examination.

4.7. Inferential Statistics

This section presents the results of correlation and regression analysis as per the objective.

4.7.1. Correlation Analysis of Independent Variables

Explores relationships among the variables of Personalization, Trust, Communication, and continuous Improvement. The results of Pearson's correlation analysis, as discussed by Mwirigi (2018), are detailed. According to Mwirigi, correlation coefficients (r) ranges from 1 (perfect linear correlation) to -1 (perfect negative correlation), with various ranges indicating different levels of correlation strength: $0.9 < r < 1$ denotes a strong confident correlation, $.7 < r < .9$ indicates a high confident correlation, and $0.5 < r < .7$ suggests a moderate confident correlation. Correlations between 0 and .5 are considered weak, while an r value 0 signifies absence of correlation. Negative correlations are indicated when $-1 < r < 0$.

Table 4.13 below presents the correlation analysis between the variables.

Table 4.13: Overall Correlation Analysis of variables

		Economic Order Quantity	Vendor MIS	Just In Time	Lean Inventory Practices	DV Supply Chain Performance
Economic Order Quantity	Pearson	1				
	Correlation					
	Sig. (2-tailed)					
	N	118				
Vendor MIS	Pearson	.713**	1			
	Correlation					
	Sig. (2-tailed)	.000				
	N	118	118			
Just In Time	Pearson	.692**	.714**	1		
	Correlation					
	Sig. (2-tailed)	.000	.000			
	N	118	118	118		
Lean Inventory Practices	Pearson	.751**	.804**	.774**	1	
	Correlation					
	Sig. (2-tailed)	.000	.000	.000		
	N	118	118	118	118	
DV Supply Chain Performanc E	Pearson	.719**	.753**	.693**	.834**	1
	Correlation					
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	118	118	118	118	118

** . Correlation is significant at the 0.05 level (2-tailed).

Source: Field Data (2024)

Results of the above reveals that Economic Order Quantity (EOQ) establishes a robust confident relationship with SCP, evidenced by a Pearson correlation coefficient ($r = 0.719$). This significant correlation ($p = 0.000$) suggests that better management of EOQ contributes notably to enhancing performance. High correlation indicates that as EOQ practices advance,

the overall SC of the also tends to improve. Additionally, EOQ shows strong positive correlations with other inventory management practices, including Vendor MIS ($r = 0.71$), Just In Time ($r = 0.69$), and Lean Inventory Practices ($r = 0.751$), all significant at the 0.01 level ($p = 0.000$). These correlations suggest that improvements in EOQ are likely to be associated with improvements in these other practices, highlighting the interconnected nature of inventory management strategies.

On a similar note, Correlation Analysis results on Inventory Management Practice show a robust confident correlation with SCP ($r = .75$) therefore this significant relationship ($p = 0.00$) indicates that effective use of Vendor MIS can substantially enhance supply chain performance by improving communication, tracking, and coordination with vendors. Pearson's Correlation results further shows that Vendor Inventory Management Practice (MIS) correlates strongly with EOQ ($r = 0.71$), Just In Time ($r = 0.71$), and Lean Inventory Practices ($r = 0.804$). These significant correlations ($p = 0.00$) underscore the importance of integrating Vendor MIS with other inventory management practices to achieve a more efficient and responsive supply chain.

Results further demonstrate that Just- In Time (JIT) inventory practices have a robust confident association with SCP ($r = .69$), which is found to be significant at the 0.01 level ($p = 0.00$). This relationship indicates that implementing JIT can significantly enhance supply chain performance by reducing inventory holding costs and improving responsiveness to demand changes. This exceptionally strong relationship indicates that adopting lean practices can lead to significant improvements in supply chain performance by minimizing waste, optimizing processes, and increasing overall efficiency. Furthermore, Lean Inventory Practices are strongly correlated with EOQ ($r = 0.75$), Vendor MIS ($r = 0.804$), and JIT ($r =$

0.77), all significant at the .01 level. These correlations highlight the critical role of lean practices in a comprehensive inventory management strategy, suggesting that lean approaches can enhance the efficiency of other IMP.

In conclusion, study highlights the substantial positive impacts of effective inventory management practices such as EOQ, MIS, JIT and LIP on supply chain performance. The significant correlations observed among these practices suggest their interdependence, implying that improvements in one aspect are likely to yield benefits across others. These findings underscore the importance of adopting a comprehensive approach to inventory management to enhance SCP effectively.

4.7.2. Simple Linear Regression Analysis Results

Simple Linear analysis was employed to assess impact of individual independent variables—EOQ, MIS, JIT and LIP—on supply chain performance within county governments in the Western Region of Kenya.

4.7.2.1. Regression of Economic Order Quantity with Supply Chain Performance

The objective was to examine the impact of Economic Order Quantity (EOQ) on supply chain performance (SCP) in county governments situated in the Western Region of Kenya. To achieve this, a hypothesis (H_{01}) was developed and tested as follows:

H_{01} : Economic Order Quantity does not have a significant effect on the SCP of county governments in the Western Region of Kenya.

This concept sought to investigate the relationship between Economic Order Quantity and SCP within the framework of inventory management practices in the Western region.

Table 4.14: Model Summary of Regression Results of Economic Order Quantity and Supply Chain Performance

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.719 ^a	.517	.513	.39211

a. Predictors: (Constant),

b. Economic Order Quantity;

Source: Field Data, (2024)

Regression analysis established a robust positive association among Economic Order Quantity (EOQ) and SCP, as evidenced by an R value of .719. and the correlation indicated substantial enhancements in supply chain performance with improvements in EOQ practices. The R Square value of 0.517 showed that EOQ explains 51.7% of the variability in supply chain performance, supported by an adjusted R Square of 0.513, underscoring the model's explanatory strength.

With a standard error of 0.39211, the model demonstrates a good fit, accurately predicting outcomes based on observed data. Rejecting the null hypothesis (H_{01}) affirms that EOQ significantly impacts SCP, emphasizing the pivotal role of effective EOQ strategies in enhancing operational outcomes within the regional governments of Kenya's Western Region.

Table 4.15: ANOVA table on Regression Results of Economic Order Quantity and Supply Chain Performance

Model	Sum of Squares		df	Mean Square	F	Sig.
1	Regression	19.07	1	19.07	124.09	.000 ^b
	Residual	17.83	116	.154		
	Total	36.91	117			

a. *Dependent Variable: DV - Supply Chain Performance*

b. *Predictors: (Constant), Economic Order Quantity ;*

Source: Field Data (2024)

The ANOVA results show that the regression model significantly predicts supply chain performance based on Economic Order Quantity (EOQ), with an F-statistic of 124.09 and a p-value of 0.00. This is supported by statistical analysis showing a highly significant F-statistic of 124.09 with a low p-value of 0.000. The regression and residual sum of squares also suggest that EOQ accounts for a substantial portion of the total variance, further confirming its significance. Therefore, it can be confidently concluded that EOQ significantly influences supply chain performance in this context.

Table 4.16: Coefficient table on Regression Results of EOQ and Supply Chain Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.09	0.304		3.60	.00
	Economic Order Quantity	0.76	0.068	0.71	11.14	.00

a. *Dependent Variable: _ DV;*

b. *Supply Chain Performance;*

Source: Field Data (2024)

The regression analysis shows that Economic Order Quantity (EOQ) significantly improves SCP, with a coefficient of 0.762 ($p = 0.000$). This means that for each unit increase in EOQ, supply chain performance increases by 0.762 units. The findings established significant effect of Economic Order Quantity on Supply Chain Performance ($\beta = .762$; $p < .05$). Hence null hypothesis is rejected at 95% level of significance and alternative hypothesis is recognized. Substitution of regression equation $Y = b_0 + b_1x_1 + e$, becomes: $Y = 1.094 + 0.762x_1 + e$.

This is findings concurred with other findings such as Atnafu and Balda, (2018), Wafula (2016), Kiboko (2017), Onchoke and Wanyoike (2016), Oballa, Waiganjo and Wachiuri (2017), Were and Nzioka, (2017) as well as Okumu and Bett, (2019) who established that EOQ has significant effect on supply chain performance but contrary to those of Bawa (2018) Asamoah and Kissi (2018) where their empirical result provided evidence that the main Variable, Economic order Quantity have no influence on performance.

4.7.2.2. Regression of Vendor Managed Inventory System with SCP.

The objective was to evaluate the impact of the vendor-managed inventory system on supply chain performance (SCP) in county governments in Western Kenya. To achieve this, the following hypothesis (H_{02}) was developed and tested:

H_{02} : The Vendor Managed Inventory System does not have a significant effect on the SCP of county governments in Western Kenya. This hypothesis served as the basis for examining the second Null Hypothesis.

Objective was to assess the effect of vendor managed inventory system on supply chain performance in county governments in western region, Kenya. To realize this objective, the

following hypothesis H_{02} was formulated and tested: H_{02} : Vendor Managed Inventory System has no significant outcome on SCP of county governments in western region, Kenya. On the second Null Hypothesis.

Table 4.17: Model Summary of Regression Results of Vendor MIS and SCP

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.753 ^a	.568	.564	.37094

a. Predictors: (Constant),

b. Vendor MIS;

Source: Field Data (2024)

The regression analysis highlights a strong positive relationship between Vendor Management Information System (Vendor MIS) and supply chain performance, with R Square value of 0.568. This indicates that approximately 56.8% of the variability in supply chain performance can be explained by Vendor MIS. The substantial R Square value underscores the significant impact of effective Vendor MIS practices on enhancing SC operations within the county governments of the Western Region

Table 4.18: ANOVA table on Regression Results of Vendor MIS and SCP

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.953	1	20.953	152.274	.000 ^b
	Residual	15.961	116	.138		
	Total	36.914	117			

a. DV - Supply Chain Performance,

b. (Constant), Vendor MIS;

Source: Field Data (2024)

The ANOVA table demonstrates a significant association among Vendor Management Information System (Vendor MIS) ON supply chain performance ($F = 152.274$, $p = 0.000$). The regression sum of squares (20.953) indicates that Vendor MIS explains a substantial portion of the variability in supply chain performance. These findings underscore the crucial role of Vendor MIS in predicting and enhancing supply chain performance within the county governments of the Western Region.

Table 4.19: Coefficient table on Regression Results of Vendor MIS and Supply Chain Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.905	.290		3.125	.002
	Vendor MIS	.845	.069	.753	12.340	.000

a. *Dependent Variable:*

b. *DV - Supply Chain Performance;*

Source: Field Data (2024).

Co-efficient table indicated a significant influence of the Vendor Management Information System (Vendor MIS) on SCP, with a coefficient of .845 ($p = .000$). This suggested that for every unit increase in Vendor MIS, SCP improves by 0.845 units. The study findings indicated that there was a statistically significant effect of vendor-managed inventory systems on Supply Chain Performance ($\beta = 0.854$; $p < 0.05$). Hence the null hypothesis is rejected at 95% level of significance and alternative hypothesis is accepted. Substitution of the regression equation $Y = b_0 + b_2x_2 + e$, becomes: $Y = 0.905 + 0.845x_2 + e$.

Findings of this study concurred with other studies carried out by Khalid and Lim (2018) as well as Ngei and Kihara (2017) as well as Michael and Wathe (2018) who established that

Vendor MIS has a positive and significant effect on performance.

4.7.2.3. Regression of Just-In-Time with Supply Chain Performance

The objective was to evaluate the effect of the Just-In-Time on supply chain performance (SCP) in county governments in Western Kenya. To achieve this, the following hypothesis (H_{03}) was developed and tested:

H_{03} : Just-In-Time does not have a significant effect on the SCP of county governments in Western Kenya. This hypothesis served as the basis for examining the third Null Hypothesis.

Table 4.20: Model Summary of Regression Results of Just-In-Time and Supply Chain Performance

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	0.693 ^a	0.480	0.475	0.40691

a. Predictors: (Constant),

b. Just-In-Time;

Source: *Field Data (2024)*

The regression analysis indicates a moderate positive correlation ($R = 0.693$) between Just In Time (JIT) practices and supply chain performance, accounting for about 48.0% of the variation ($R^2 = 0.480$) in supply chain performance. This implies that JIT practices have significant predictive capability in improving supply chain operations within the county governments of the Western Region, Kenya.

Table 4.21: ANOVA table on Regression Results of JIT and SCP

Model	Sum of Squares	df	Mean Square	F
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1	Regression	17.708	1	17.708	106.94
	Residual	19.207	116	.166	
	Total	36.914	117		

a DV - Supply Chain Performance Variable: (Constant),

b. Just-In-Time;

Source: Field Data (2024)

The ANOVA table revealed a significant relationship between JIT practices and supply chain performance, with an F-statistic of 106.947 and a p-value of .000. This indicates that the regression model is a strong predictor of supply chain performance based on JIT practices. The regression sum of squares (17.708) suggests that JIT accounts for a considerable portion of the variability in supply chain performance. The findings emphasize the crucial role of JIT practices in improving supply chain performance within the context of the dependent variable.

Table 4.22: Co-efficient table on Regression Results of Just-In-Time and Supply Chain Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error.	Beta.		
1	(Constant)	1.150	0.322		3.576	0.001
	Just-In-Time	0.777	0.075	.693	10.342	0.000

a. Dependent Variable:

b. DV - Supply Chain Performance;

Source: Field Data (2024)

The results led to the rejection of hypothesis H0₃, which proposed that Just-In-Time (JIT) practices have no significant effect on supply chain performance (SCP) in regional governments in the Western Region of Kenya. The significant coefficient ($p < 0.001$) of

0.777 for JIT indicates that an increase in JIT practices results in a corresponding improvement of 0.777 units in SCP. These findings clearly demonstrate that JIT practices have a significant and positive impact on SCP in the regional governments of Western Kenya.

The study established a notable effect of JIT on SCP, with a coefficient of $\beta = 0.777$ and a p-value less than 0.05, leading to the rejection of the null hypothesis at a 95% significance level and acceptance of the alternative hypothesis. Substitution of the regression equation $Y = b_0 + b_3x_3 + e$, becomes: $Y = 1.150 + 0.777X_3 + e$. These findings are consistent with previous studies by Kaswan *et al.* (2019), Filippini and Forza (2016), Kariuki (2017), and Shajema (2018), who also found that JIT positively influences performance. However, the findings contradict the study by Muchaendepi *et al.* (2018), which suggested that JIT has no effect on SCP.

4.7.2.4. Simple Regression of Lean Inventory Practices with Supply Chain Performance

The fourth objective was to evaluate the effect of Lean Inventory Practices on supply chain performance (SCP) in county governments located in the Western Region of Kenya. To achieve this objective, the following hypothesis (H_{04}) was developed and tested as shown below;

H_{04} : Lean Inventory Practices have no significant impact on SCP in county governments in the Western Region of Kenya. This hypothesis served as the basis for assessing the fourth objective.

Table 4.23: Model Summary of Regression Results of Lean Inventory Practices & SCP

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.834 ^a	.695	.693	.31142

a. Predictors: (Constant),

b. Lean Inventory Practices;

Source: Field Data (2024)

Regression analysis established a robust positive association among Lean inventory practices and SCP, as evidenced by an R value of .834 and the correlation indicated substantial enhancements in supply chain performance with improvements in Lean Inventory practices. The R Square value of 0.695 showed that LIP explains 69.5% of the variability in supply chain performance, supported by an adjusted R Square of 0.693, underscoring the model's explanatory strength. With a standard error of 0.31142, the model demonstrates a good fit, accurately predicting outcomes based on observed data. Rejecting the null hypothesis (H0₄) affirms that LIP significantly impacts SCP, emphasizing the pivotal role of effective LIP strategies in enhancing operational outcomes within the regional governments of Kenya's Western Region.

Table 4.24: ANOVA table on Regression Results of Lean Inventory Practices and Supply Chain Performance

a.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.66	1	25.66	264.62	.000 ^b
	Residual	11.25	116	0.09		
	Total	36.91	117			

Dependent Variable: DV -Supply -Chain –Performance;

b. Predictors: (Constant), Lean -Inventory -Practices;

Source: Field Data (2024)

The ANOVA table shows a significant relationship between Lean Inventory Practices and Supply Chain Performance (F = 264.62, p < 0.001). The regression sum of squares (25.66)

indicates that Lean Inventory Practices explain a considerable amount of the variability in supply chain performance. These findings highlight the importance of Lean Inventory Practices in predicting and enhancing supply chain performance.

Table 4.24: Coefficient table on Regression Results of Lean Inventory Practices and Supply Chain Performance

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.50	0.24		2.06	0.04
	Lean Inventory Practices	0.93	0.05	0.83	16.26	0.00

- a. *Dependent Variable: DV*
- b. *Supply Chain Performance;*
- Source: Field Data (2024)*

The coefficient table shows that Lean Inventory Practices significantly influence Supply Chain Performance ($p < 0.001$). For every unit increase in Lean Inventory Practices, there is a corresponding increase of 0.930 units in supply chain performance.

This relationship is supported by the strong standardized coefficient (Beta) of 0.834 and a high t-value of 16.267. Hence the null hypothesis is rejected at 95% level of significance and alternative hypothesis is accepted.

Substitution of the regression equation $Y = b_0 + b_1X + e$, becomes: $Y = 0.505 + 0.930X + e$; The study findings are similar to research done by, Ndiwa, (2022), Shajema (2018), Kihara and Odhiambo, (2018), Mukopi and Iravo (2015) who established that Lean Inventory Practices, has a significant effect on performance. The findings are contrary to that of Gad (2017)

who's findings of regression analysis indicated that Lean Inventory Practices was negative but significant predictor of performance of procurement function on the effect of inventory management practices.

4.7.3 Multiple Regression Results

The results are presented as showed below Table 4.25

Table 4.25: Multiple Regression Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
F 1	0.85 ^a	0.72	0.71	0.29

a. Predictors: (Constant);

Source; Field Data (2024)

From above result, R= .85, R- square = .72, adjusted R- square= .71 and SE=.29. Coefficient of determination also called the R square is .72. This implied that effect of Lean Inventory Practices, Vendor MIS, Just - In -Time, Economic Order Quantity is of a tune of 72% of the variations in Supply Chain Performance. Therefore, the study assumed that the difference 28% of the variations was as a result of other factors not included in this study.

Table 4.26: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	26.91	4	6.72	76.00	.000 ^b
Residual	10.00	113	0.09		

Total	36.91	117
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a. V : Supply Chain Management;
b. IV : , Economic Order Quantity,
c. Vendor MIS, d. Just - In -Time
d. Lean Inventory Practices ;
Source; Field Data (2024)

Results findings presented in Table 4.17 showed significant association among the independent variables and the dependent variable ($F= 76.00$; $p=0.000$). This was a clear indication that, Lean Inventory Practices, Vendor MIS, Just - In -Time, Economic Order Quantity influenced SCP in County governments in Western Region, Kenya.

Table 4.27: Multiple Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.288	.275		1.049	.297
Economic Order Quantity	.195	.088	.175	2.141	.011
Vendor MIS	.250	.166	.185	2.191	.003
Just In Time	.250	.137	.169	1.372	.000
Lean Inventory Practices	.643	.100	.577	6.425	.000

- a. Dependent Variable: DV ;*
b. Supply Chain Management);
Source; Field Data (2024)

Regarding combined effect of the inventory management practices the study established a positive significant effect of Economic Order Quantity on supply chain performance ($\beta = .195$; $p < .011$), established positive significant effect of Vendor MIS on supply chain performance ($\beta = .250$; $p < .003$), thirdly a positive significant effect of J IT on supply chain

performance($\beta = 0.250$; $p < .000$). Finally, there was a positive significant effect of Lean Inventory practices on supply chain performance ($\beta = .643$; $p < .000$).

Multiple Regression equation $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$. Therefore, becomes: $Y = 0.288 + 0.195 + 0.250 + 0.250 + 0.643 + e$. Therefore, adjusting Economic Order Quantity 1 unit results to 0.195 units change on performance of county governments of Western Region, Kenya. A unit change of Vendor MIS led to 0.250 units change on performance of county governments of Western Region, Kenya. In addition, a unit change in JIT led to 0.250 units change on performance of county governments of Western Region, Kenya. Finally, a unit change in Lean Inventory Practices led to 0.643 units change on performance of county Governments of Western Region, Kenya. Hence, all variables are statistically significant predictors of the dependent variables.

This study established that inventory management practices influences supply chain performance of the county governments in western region, Kenya a result which is similar to research done by, Atnafu and Balda, (2018), Were & Nzioka, (2017), Meredity *et al.* (2022) as well as Okumu and Bett, (2019) who established that inventory management practices influences supply chain performance. The findings is contrary to those of Bawa, Asamoah and Kissi (2018) and Gad (2017) who's findings established that inventory management practices has no influence on supply chain performance.

4.8 Summary of Hypotheses Tests

Table 4.27: Summary of Suppositions Test Outcomes

#	Hypothesis	Test Criteria	Decision	Conclusion
H₀₁	Economic Order Quantity does not significantly impact the supply chain performance of county governments in western region, Kenya	Reject Null Hypothesis if $P < 0.05$; Alternatively, Fail to Reject	Rejected	Economic Order Quantity significantly impacts the supply chain performance of county governments in the western region, Kenya
H₀₂	Vendor Managed Inventory System does not have significant impact on supply chain performance of county governments in western region, Kenya	Reject Null Hypothesis if $P < 0.05$; Alternatively, Fail to Reject	Rejected	Vendor Managed Inventory Systems significantly impact the supply chain performance of county governments in western region, Kenya
H₀₃	Just-In-Time does not have significant impact on supply chain performance of county governments in western region, Kenya	Reject Null Hypothesis if $P < 0.05$; Alternatively, Fail to Reject	Rejected	Just-In-Time significantly impacts the supply chain performance of county governments in the western region, of Kenya
H₀₄	Lean Inventory Practices do not significantly impact the supply chain performance of county governments in western Kenya.	Reject Null Hypothesis if $P < 0.05$; Alternatively, Fail to Reject	Rejected	Lean Inventory Practices has an impact on the supply chain performance of county governments in western Kenya.

Source: *Research data (2024)*

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study findings, conclusion and recommendations.

5.2 Summary of Findings

The primary objective was to determine the impact of inventory management practices on supply chain performance in county governments within the western region of Kenya. A sample of 120 respondents was utilized. Data was gathered through questionnaires, analyzed using both descriptive and inferential statistics, and presented in tables and charts. The findings revealed that all variables significantly influenced supply chain performance.

5.2.1 Economic Order quantity and supply chain performance.

Most of the interviewee concurred to the remark on economic order quantity that my County has greatly reduced the buffer stock level, strike a balance between Overstocking and understocking which will ultimately lead to optimum stock level stored, my county engages in demand forecasting which aids in determining when goods/services will be required, my county monitors stock levels frequently, my county determines in advance the quality of goods to be purchased and my county determines in advance the period when to make an order. Correlation analysis results as per the first objective indicated a strong positive and significant relationship between the variable (EOQ) and supply chain performance, with an R value of 0.719. The R Square value of 0.517 signifies that EOQ accounts for 51.7% of the

variability in supply chain performance. Regression analysis indicated that Economic Order Quantity (EOQ) significantly improves supply chain performance, with a coefficient of ($\beta=0.762$, $p = 0.000$).

5.2.2 Vendor Managed Inventory System and Supply Chain Performance

Majority of the respondents were in agreement to the statements on Vendor Managed Inventory System that supplier makes re-supply decision on behalf of the County as a result of being aware of stock levels, my County updates its suppliers on stock, my County enjoys a cordial relation with its supplier's, and suppliers use information provided by the county to fulfill orders majority of the respondents, Correlation analysis results as per the second objective indicated a strong positive relationship between Vendor managed inventory system and supply chain performance, with an R value of 0.753. The R Square value of 0.568 signifies that Vendor MIS accounts for 56.8% of the variability in supply chain performance.

5.2.3 Just-In-Time (JIT) and Supply Chain Performance

Majority of the respondents were in agreement to the statements on Just-In-Time (JIT) that, automation has made ordering and re-ordering easy, my County uses data to manage inventory results as per response, my county orders what is needed at the time it is needed posted the following results and there has been timely delivery of goods and services by suppliers in my County. Correlation analysis results as per the third objective indicated a strong positive relationship between Just-In-Time (JIT) and Supply Chain Performance, with an R value 0.693. The R Square value of 0.475 signifies that Just-In-Time (JIT) accounts for 47.5% of the variability in supply chain performance.

5.2.4 Lean Inventory Practices with Supply Chain Performance

Majority of the interviewee were in support to the statements on Lean Inventory Practices that stock piling is unnecessary and expensive, my County considers flexibility in making Ordering decisions, my County minimizes waste through lean practices and lastly my County has reduced stocks of inventory held on site. Correlation analysis results as per the fourth objective indicated a strong positive relationship between Lean Inventory Practices and Supply Chain Performance, with an R value 0.834. The R Square value of 0.695 signifies that Lean Inventory Practices accounts for 47.5% of the variability in supply chain performance.

5.3. Conclusions

Conclusions were based on specific objectives as illustrated below:

5.3.1 Economic Order Quantity and Supply Chain Performance

Findings of the above objective provide robust evidence that Economic Order Quantity (EOQ) significantly influences the supply chain performance. Most organizations today have embraced Economic Order Quantity as its able to reduce buffer stock, ability to enhance Vendor demand forecasting as well as being able to ensure stock level management.

5.3.2 Vendor Managed Inventory System and Supply Chain Performance

Findings of the second objective provide robust evidence that Vendor Managed Inventory System significantly influences the supply chain performance and this can be done through,

order fulfillment and buyer-supplier relationship. The regression coefficients of the study show that Vendor Managed Inventory System has a significant influence on performance of the County Governments in Western Region, Kenya. This implies that increasing levels of Vendor Managed Inventory System would increase the performance of the County Government.

5.3.3 JIT and Supply Chain Performance

Findings of this objective provide robust evidence that Just – In - Time significantly influences the supply chain performance and this can be done through, system automation and timely delivery. The regression coefficients of the study shows that Just-In-Time has a significant influence on performance of the County Governments in Western Region, Kenya. This implies that increasing levels of Just-In-Time would increase the performance of the County Government

5.3.4 Lean Inventory Practices and Supply Chain Performance

Lastly, Objective four sought to assess the effect of a lean inventory practices on supply chain performance of County Governments in Western Region, Kenya. The finding that Lean Inventory practices had significant influence on the SCP as this can be done through flexible ordering as well as framework contracting led to the rejection of null hypothesis that Lean inventory system does not influence supply chain performance of the County Governments in Western Region, Kenya.

5.4. Contribution of the study

This study contributes to management practices as it provide substantial evidence that the

management in the County governments in the western region of Kenya can use to enhance their performance by effectively managing their inventory. As a result, county managers will find this research beneficial for both knowledge acquisition and practical application.

The study's findings would offer insights into inventory management practices that would inform both current and future policy decisions, serving as a guideline for policymakers in designing effective strategies for inventory management. Additionally, the research will be valuable to scholars by laying the groundwork for further studies in the areas of inventory management and supply chain performance, particularly within County Government. The study provides a valuable resource for academics, scholars, and researchers interested in this field, contributing to the advancement of knowledge, especially within county operations.

5.5 Recommendations

5.5.1 Economic Order Quantity

This research recommends the adoption as well as integration of Economic Order Quantity (EOQ) methodologies into the supply chain strategies of county governments in western Kenya and therefore Counties should greatly reduce the buffer(excessive) stock level, Counties should engage in demand forecasting which aids in determining when goods/services will be required. Counties should determine in advance the quality of goods to be purchased, Counties should determine in advance services required as well as considering between stocking too much and maintain in adequate inventory which will ultimately lead to optimum stock level stored.

5.5.2. Vendor Managed Inventory System

This research recommends for the adoption as well as integration of Vendor Managed Inventory System methodologies into the supply chain strategies of county governments in western Kenya and therefore, suppliers should make re-supply decision on behalf of the county as a result of being aware of stock levels, County should update its suppliers on stock, Counties should enjoy a cordial relation with its suppliers, suppliers should use information provided by the Counties to fulfill orders and lastly Counties should Share information with suppliers regarding inventory status.

5.5.3. Just – In - Time

This research recommends adoption and integration of JIT methodologies into SC strategies of county governments in western Kenya and therefore, Counties should resort to Automation that has made ordering and re-ordering easy, County should use data to manage inventory, Counties should order what is needed at the time it is needed, Counties should be able to free up physical space due to making on demand orders, there should be timely delivery of goods and services by suppliers in my county, there should quick and easy delivery of services in county due to reliable suppliers.

5.5.4. Lean Inventory Practices

Finding recommends adoption as well as integration of Lean Inventory Practices methodologies into SC strategies of county governments in western Kenya and therefore, Counties should consider flexibility in making ordering decisions, counties should minimize waste through lean Practices, Counties should reduce stocks of inventory held on

site, there is need for agreement that allow making of requisitions when need arises, Counties should place orders on needs basis, Counties should order minimum quantity of required services or works where the quantity are not determined at the beginning and lastly stock piling is unnecessary and expensive.

5.6 Suggestions for Further Research

First, future research can use other moderators for instance government policy and rules and regulation to establish either same or different result since the current study focuses on direct impact of inventory management practices on supply chain performance. Secondly, this study focuses on the influence of inventory management using only four inventory management practices which included Economic order quantity, Vendor managed inventory systems, Just-In-Time and lastly Lean inventory practices thus giving room for other inventory management practices such as warehousing, Materials requirements planning practices that has not been mentioned for other researchers to research on

Thirdly, the research can be extended to other sectors as this was done on County government and this would fill the above gaps such as contextual, sectorial and conceptual gaps, the current study sought to establish the effect of inventory management practices and SCP of county governments in western region, Kenya. For example, to fill sectorial gap other researchers can opt to carry out research on the influence of inventory management practices and supply chain performance i.e in education sector, Small Enterprises in Kenya as well as textile manufacturing firms in Kenya.

Fourthly, this study can be extended on other counties as this was only limited to western region, Kenya. For example, to fill this gap other researchers can opt to carry out research on

the influence of inventory management practices and SCP in i.e. Health segment, Small Enterprises as well as textile manufacturing firms in Uganda or Tanzania which are region based or carry the research with a global view that is for instance In China or USA.

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APPENDICES

APPENDIX I: INTRODUCTION LETTER

Dear Sir/Madam

RE: DATA COLLECTION FOR MBA THESIS

I am student of Masinde Muliro University of Science and Technology pursuing Masters in Business Administration (Procurement Option). I am currently doing my thesis on 'Effect of Inventory Management Practices on Supply Chain Performance of County Governments in Western Region, Kenya'. You are therefore among those who have been selected to provide information beneficial to this study. The information you will provide will be highly appreciated.

Thank you very much as I look forward for your positive collaboration, in case of any queries please feel free to reach me on the contact details provided below.

Yours Sincerely,

DAVID ODIWUOR

MBA/G/01-70433/2021; 0708025395; ohuladave@gmail.com

APPENDIX II: QUESTIONNAIRE

This questionnaire is designed for the sole purpose of collecting data on the effect of inventory management practices and supply chain performance of county governments in western region, Kenya. The data collected will be treated with a very high degree of confidentiality and it is meant for academic purposes only. Please provide the information frankly and honestly.

SECTION A: DEMOGRAPHIC INFORMATION

(Kindly tick as appropriate)

3.) What is your highest level of academic qualification?

Postgraduate ()

Degree ()

Diploma ()

Certificate ()

Other (specify).....

4.) How long have you worked for the institution?

Less than 2 years ()

2 to 5 years ()

6 to 10 years ()

Over 10 years ()

Other (specify)

SECTION B: INVENTORY MANAGEMENT PRACTICES

i. Economic Order Quantity

5) To what extent do you agree with the following statements on Economic Order Quantity in your institution? (Kindly tick as appropriate) (Use the scale of: 1-Strongly Disagree, 2-Disagree, 3- Fairly Agree, 4-Agree, 5-Strongly Agree

NO	Statements on Economic Order Quantity	1	2	3	4	5
1.)	County Governments has greatly reduced the buffer (excessive) stock level.					
2.)	County strike a balance between ordering costs and holding (or storage) costs, will ultimately lead to optimum stock level stored.					
3.)	County Government engages in demand forecasting which aids in determining when goods/services will be required.					
4.)	County monitor's stock levels frequently.					
5.)	County determines in advance the quality of goods to be purchased.					
6.)	County determines in advance the period when to make an order.					
7.)	County determines in advance services required.					
8.)	County Government avoids scenarios where there is stock out.					
9.)	County uses store ledgers and stock control cards in managing inventories.					

ii. Vendor Managed Inventory System

6) To what extent do you agree with the following statements on Vendor Managed Inventory System in your institution? (Kindly tick as appropriate) (Use the scale of:

1-Strongly Disagree, 2-Disagree, 3- Fairly Agree, 4-Agree, 5-Strongly Agree

NO	Statements on Vendor Managed Inventory System	1	2	3	4	5
1.)	The supplier makes re-supply decision on behalf of the county as a result of being aware of stock levels.					
2.)	County Government update its suppliers on stock.					
3.)	County Government enjoys a cordial relation with its suppliers.					
4.)	County enjoys a good buyer- supplier relationship.					
5.)	Suppliers use information provided by the county to fulfill orders.					
6.)	County Governments Share information with suppliers regarding inventory status.					

iii. Just-In-Time

7) To what extent do you agree with the following statements on Just-In-Time in your institution? (Kindly tick as appropriate) (Use the scale of: 1-Strongly Disagree, 2-Disagree, 3- Fairly Agree, 4-Agree, 5-Strongly Agree)

NO	Statements On Just-In- Time	1	2	3	4	5
1.)	Automation has made ordering and re-ordering easy.					
2.)	County uses data to manage inventory.					
3.)	County orders what is needed at the time it is needed.					
4.)	County Government has been able to free up physical space due to making on demand orders.					
5.)	There has been timely delivery of goods and services by suppliers in the scounty.					
6.)	There has been quick and easy delivery of services in county due to reliable suppliers.					
7.)	County Government uses contracts that allows placing orders on need basis to manage its inventory.					

iv. Lean Inventory Practices

- 8.) To what extent do you agree with the following statements on Lean inventory management practices in your institution? (Use the scale of: 1- Strongly Disagree, 2-Disagree, 3- Fairly Agree, 4-Agree, 5- Strongly Agree.

NO	Statements On Lean Inventory Practices	1	2	3	4	5
1.)	Stock piling is unnecessary and expensive.					
2.)	County considers flexibility in making ordering decisions.					
3.)	County Government minimizes waste through lean Practices.					
4.)	County has reduced stocks of inventory held on site.					
5.)	There has been use of contracts that allow placing orders on the need basis to manage inventory.					
6.)	County Government places orders on needs basis.					
7.)	County orders minimum quantity of required services or works where the quantity are not determined at the beginning.					

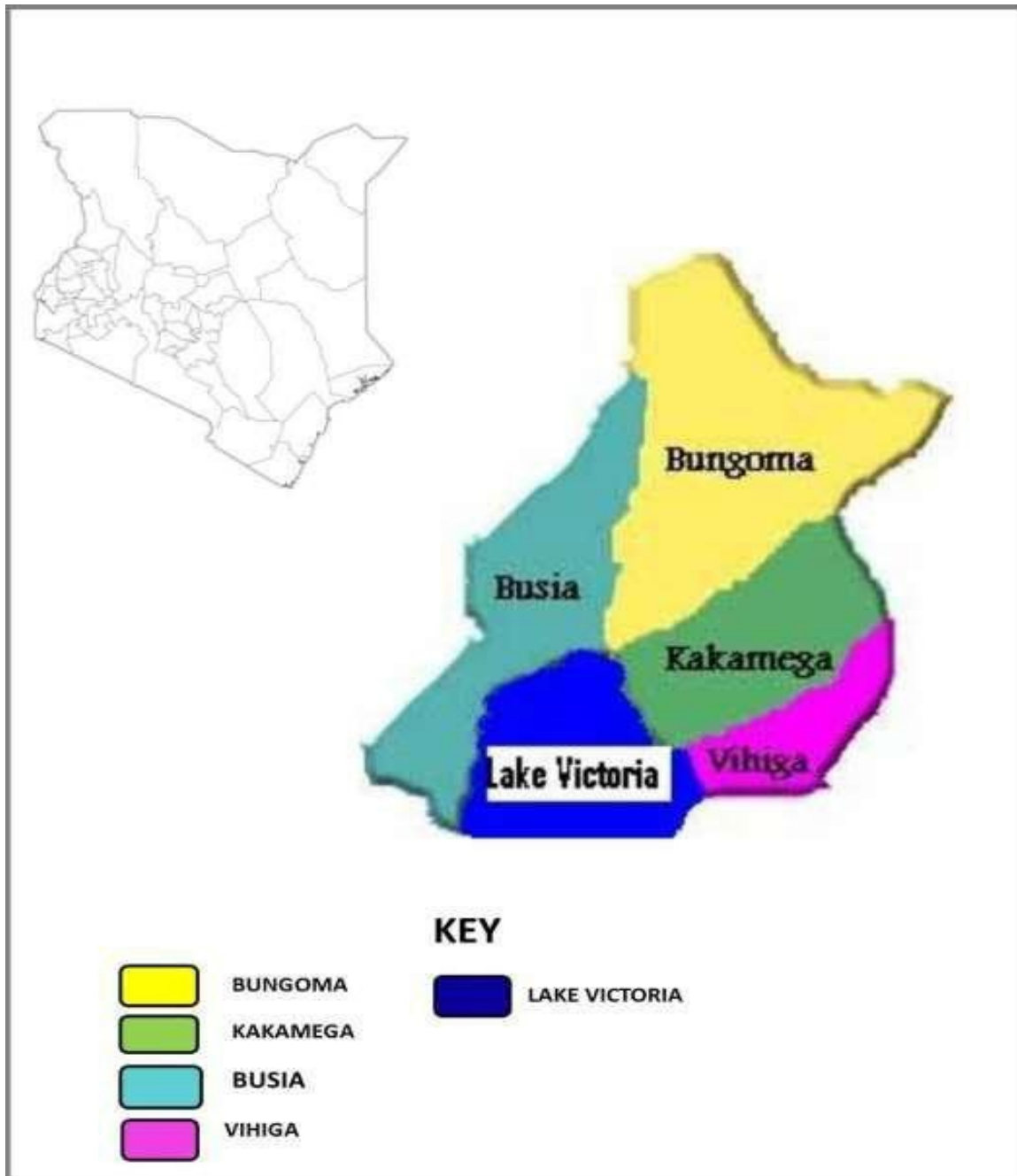
SECTION C: SUPPLY CHAIN PERFORMANCE

- 9.) To what extent do you agree with the following statements on Supply Chain Performance in your institution? (Use the scale of: 1-Strongly Disagree, 2 -Disagree, 3- Fairly Agree, 4-Agree, 5- Strongly Agree)

NO	Statements on Supply Chain Management	1	2	3	4	5
1.)	Inventory Management practices has increased customers satisfaction.					
2.)	Inventory Management practices has led to Cost reduction.					
3.)	Inventory management practices leads to efficiency.					
4.)	There are less complaints in regards to goods supplied in the last three years					
5.)	Inventory management practices leads to responsiveness.					

Thank you for completing the questionnaire, to request feedback on the finding of this study upon completion, please use the email address:
ohuladave@gmail.com

APPENDIX III: STUDY ARE MAP



Source: *Kenya Maps & Facts - World Atlas (2024)*

APPENDIX IV: UNIVERSITY RESEARCH LETTER



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

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P.O Box 190
Kakamega – 50100
Kenya

Directorate of Postgraduate Studies

Ref: MMU/COR: 509099

25th January 2024

David Odiwuor Oboge
MBA/G/01-70433/2021
P.O. Box 190-50100,
KAKAMEGA.

Dear Mr. Oboge

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your masters proposal entitled '*Effect of Inventory Management Practices and Supply Chain Performance of County Governments in Western Region, Kenya*' and appointed the following as supervisors:

- | | |
|-----------------------|---------------|
| 1. Dr. Evens Kwendo | - SOBE, MMUST |
| 2. Dr. Jackline Odera | - SOBE, MMUST |

You are required to submit through your supervisor(s) progress reports every three months to the Director Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Business and Economics Graduate Studies Committee and Chairman, Business and Economics Department. Kindly adhere to research ethics consideration in conducting research.

It is the policy and regulations of the University that you observe a deadline of two years from the date of registration to complete your Master's thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,




Prof. S. Odebero, PhD, FIEP
DIRECTOR, DIRECTORATE OF POSTGRADUATE STUDIES

APPENDIX V: RESEARCH PERMIT

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 701833	Date of Issue: 17/April/2024
RESEARCH LICENSE	
	
This is to Certify that Mr.. ODIWUOR OBOGE DAVID of Masinde Muliro University of Science and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Bungoma, Busia, Kakamega, Vihiga on the topic: EFFECT OF INVENTORYMANAGEMENT PRACTICES ON SUPPLY CHAIN PERFORMANCE OF COUNTY GOVERNMENT IN WESTERN REGION, KENYA for the period ending : 17/April/2025.	
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Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

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

CONDITIONS OF THE RESEARCH LICENSE

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

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