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**Relationship Between Inventory Control Practices And
Supply Management In Selected Public And Private
Universities In Nakuru County, Kenya**

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**RELATIONSHIP BETWEEN INVENTORY CONTROL PRACTICES AND
SUPPLY MANAGEMENT IN SELECTED PUBLIC AND PRIVATE
UNIVERSITIES IN NAKURU COUNTY, KENYA**

BILHA SARO

**A Thesis Submitted to the Board of Graduate Studies in Partial Fulfilment of the
Requirement for the Conferment of the Degree of Master in Business
Administration (Procurement and Logistics Option) of the University of
Kabianga.**

UNIVERSITY OF KABIANGA

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DECLARATION AND APPROVAL

Declaration

This Thesis is my original work and has not been submitted for the award of a diploma or a degree in this or any other University;

Signature: ...  Date: 09/02/2022

Bilha Saro

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Approval

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DEDICATION

To my beloved Dad and Mum, Brothers and Sisters. I say a big thank you for their support and encouragement throughout my learning. May God bless them in abundance.

ACKNOWLEDGEMENT

First of all I thank God for the grace and strength to carry out the task. I'm grateful to my supervisors Dr. Pauline Keitany and Dr. Williter Rop for their tireless assistance and guidelines in writing this thesis. Again I would like to thank my parents for the moral support during the research writing.

Finally I'd not forget to acknowledge the procurement class for their corporation that made it possible for us to sail through as a team. To all I say, thanks and may the Almighty God bless you!!

ABSTRACT

Supply management is increasingly becoming focus in this 21st century. For an organization to compete and successfully operate in the current dynamic supply management atmosphere, it must apply control measures that are effective within its internal supply management. However, there is an outcry in Universities procurement sector for inadequate stock control. Hence the aim of the study is to establish the relationship between inventory control practices and supply management in selected public and private Universities in Nakuru County. The following objectives guided the study; to establish the relationship between inventory audit and supply management, to examine the relationship between inventory management systems and supply Management, and to determine the relationship between inventory security and supply management in selected public and private Universities in Nakuru County. The study was guided by the following theories; stock diffusion, resource dependency and economic order quantity theory. The study was significant to development of necessary policies in the Universities that would enhance stable and smooth running in supply management. Positivism research philosophy with correlation research design was adopted. Correlation was appropriate for this study because it was used to establish the relationship between the following key variables inventory audit, inventory management systems, inventory security and supply management. The target population of this study was 115 employees drawn from procurement department from Egerton and Kabarak Universities since their headquarters are found in Nakuru County. Multistage sampling procedure was used to select the respondents of the study from the two Universities. Taro Yamane's formula was used to obtain a sample size of 89 respondents. Data collection was done by use of Questionnaires and it was analysed by the aid of SPSS version 25. Validity of the instrument was realized through incorporating the opinions from the supervisors and reliability was tested using Cronbach's Alpha coefficient and the value 0.7 and above was deemed reliable. The data was analysed using both quantitative and inferential statistics. Findings revealed that inventory audit were efficiently done through ensuring accuracy in recording. The Universities also ensure that costs were well controlled to reduce waste and mismanagement of resource. The inventory audit was also done periodically to ensure all Universities property and resources are secured. Hence, there existed significant relationship between inventory audit and supply management ($r=0.839$, $P<0.05$). Inventory management system adapted inventory coding for ease of tracking. However, the Universities moderately conducted cycles counting and verification as well as replenished stock based on available information in records. Inventory management system somewhat assisted in inventory budgeting. Therefore, there existed significant relationship between inventory management system and supply management ($r=0.610$, $P<0.05$). It was also found that the Universities kept records to safeguard Universities' resources, did inventory inspection to reduce losses of items and stock taking to ensure security of all the inventory. Hence there was sufficient security system to ensure no security bridge. This results indicated that there existed significant relationship between inventory security and supply management ($r=0.749$, $P<0.05$). The study concluded that inventory audit, inventory management system and inventory security had significant influence on supply management. The study recommended that Universities had room for elimination of shortage, losses and wastage through periodic inventory audit. The Universities should also adapt electronic inventory management system that can make tracking easy.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
EOQ	Economic Order Quantity
IERC	Institutional Ethics Review Committee
NACOSTI	National Commission for Science, Technology and Innovation
PPPFA	Preferential Procurement Policy Framework Act
SPSS	Statistical Package for Social Sciences
US	United States of America
VIF	Variance Inflation Factor

OPERATIONAL DEFINITION OF TERMS

Inventory Control will address the issue of having correct level of inventory in order to meet demand (Owuoth & Mwangi, 2015). These include inventory audit, inventory management system and inventory security.

Inventory Audit basically mean that the amount of inventory on hand should conform to the records (Lewis & Media, 2014). In the study inventory audit involve the efficiency, inventory accuracy and cost control in inventory management.

Inventory Management System refers to a component of supply management that overlooks the flow of items as they move from the hands of manufacturer to the point of the ultimate consumer (Musau, 2015). In the study inventory coding, inventory tracking and cycle counting represents inventory management system.

Inventory Security literally mean safeguarding the inventory by keeping accurate records (Troxell, 2015). In the study it include record keeping, inspection and stock taking in the organization.

Supply Management refers to the entire management of inventory from suppliers to the procurement department (Ross, 2015). In the study inventory turnover, lead time and effectiveness represent supply management.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter contains the background of the study, problem statement, research objectives and assumptions of the study, significance of the study, limitations and the scope of the study.

1.2 Background of the Study

The supply management environment is identified with many factors that are risk and may impact unfavorably on the inventory control enterprise operations. For an institution to compete and run successfully in the modern supply of risk management environment, effective control measures should be put in place within its internal supply management in an organization. Kravchenkova and Posazhennikova (2012), revealed that one of the ways that is adopted currently by enterprises is the growth of inventory control system that is effective. Irrespective of the scope, size or location of operation inventory control has continued to be an area of interest to every business due to the costs associated with it. Inventory control accounts for forty-five to ninety percent of total organizational expenses (Geda, 2016). Moreover, this inventory control can be applied as a tactical plan by an organization to realize a more effectiveness and efficiency in daily running and intensify management of resources; internal processes, tracking of items across the organization and smooth operations internally can be streamlined by use of inventory control which in turn help improve organization internal efficiency (Oballah, 2015).

Globally, inventory control in every organization is currently crucial for smooth running. Based on the external environment operation, organizations adopt various inventory control practices. Inventory control practices in Canada have become popular both private and public organization. A study done by Elections Canada (2010) on inventory control framework audit done internally showed that place processes, practices, procedures and controls has been put in place appropriately in Canada for inventory of election supplies to be managed. In the US, Accounting Office came up with a guide in 2002 for the executive to enhance accurate and consistent inventory control that enabled improved reliability and accuracy of inventory management (United States General Accounting Office, 2002). Related study at the Mississippi University by the National Food Service Management Institute in 2012 provided a guide of reference for inventory management. One of the most important components of management is the support of the growth of this guide of the management inventory which is in other management apart from the United States Department of Agriculture (National Food Service Management Institute, 2012).

In Africa, there has been popularity of procurement of inventory control concept and accounting systems dating back to early 1930s. Scholars argued that inventory control systems attained fame at the time of industrialization. For example, inventories provide a direct connection between sales and production and entails a percentage perceived to be good of organizations cost in Nigeria, which has led to bigger investment by the organizations on the systems that can enable inventory control. Ogbo, (2014) argued that where the top management is directly involved the organizations has to design long term strategies policies and inventory control of inventory management. The situation in South Africa is not different because inventory control remains a challenge to the

organizations, especially public organizations. Nzuza (2015) carried out a study in the Municipality of Thekwini, on the elements influencing the success of inventory control, Durban suggested a revision of inventory control after finding out that there are shortcomings in the inventory systems. In response to such findings, the Preferential Procurement Policy Framework Act (PPPFA) has been put in place in municipal authorities to steer inventory control (Nzuza, 2015).

In Kenya, there has been continued problem of inventory management faced by the organizations similar to other African nations. Basing on the assertion that control of inventory is crucial element in improving profits and utility of the customer. In small or large, private or public organization inventory controls are taken into consideration both at the local or global. Many organizations strive to achieve maximum inventory control while minimizing cost of inventory. Swaleh and Were (2014) conducted a study of Public Sector in Kenya, on the factors influencing management inventory systems implementation and revealed that the core aims of inventory control minimum control of inventory cost and holding the right quantity of inventory.

According to Pan, Nigrelli, Ballot, Sarraj, and Yang (2015), organizations are developing inventory control system at an increasing rate and adopting systems that can solve procurement challenges currently. In Kenya inventory control systems are used as tools to upgrade financial performance (Onchoke and Wanyoike, 2016). Some inventory control practices adopted in Kenya include; inventory management systems, inventory audits and inventory security (Swaleh, 2014). Most organizations have distinct supply management unit which is responsible for the stock control activities.

The activities found within the supply management unit generally include; Stock Control, Management, Procurement and Storage. Inventory control as one of the activities in resource management has proved to be critical issue that should be taken into consideration as those stock constitute a larger part of investment in business and should be managed well to optimize profits (Ross, 2015). Njeru (2015) noted that public sectors in Kenya and other third world countries leave inventory decision to store management and departments. As a result, Yadav (2015), further pointed the relating challenges in terms of selection of suppliers, high cost of inventory, delivery challenge, stock obsolescence and as well as stock-out. It is clear that emergency buying is common in most of the Universities procurement practices as compared to the public laws of procurement as proper procurement procedures are not fully followed (Chemjor, 2015). Therefore, the study focus was to establish the relationship between inventory control practices and supply management in selected public and private Universities in Nakuru County.

1.2.1 Inventory Control Practices

Inventory control shows the amount that is available at a given time, and how you make follow-up of it. It is applicable to every material which aid in production of a product be it from raw materials to finished product. At every production stage process, it covers stock from the time it is bought to delivery to applying stock reordering. Successful control of stock gives one to own the right quantity of stock in the right time and place. It makes sure that the capital is not necessarily tied up, and in case challenges arise it protects production in the supply management (Yadav, Ajay, Singh, 2016). Therefore, inventory control practices should go hand in hand with the direction of organization

strategic, internal procurement and stores objective in order to reduce effect on supply management (European Academy for Taxes, Economics & Law, 2015).

For the growth and productivity of the organization, it is beneficial that good inventory controls are used because there is more investment of capital in the stock (Kruger, 2005). Proper management of stock in the organization may lead to the utilization of the gained inventories elsewhere which in turn enhances the organizational productivity. According Abuya and Shale, (2018) posited the fact that inventories are kept in the space of the organization, to make sure that there is maximum quantity of the services at the required quality and delivered at the right time. The stock control practice also puts emphasis on the quantity and quality of the items being used in the organization (Langenwaller, 2019).

Effective inventory control practices have become a critical issue for operations of an organization that aims at achieving efficient functions. Many organizations have faced the challenge of reduction of cost, enhanced efficiency, improved supply management and high customer utility level through inventory control practices (Chapman, 2000).

This is due to the fact that inventory control gives integration of production that is better and operation methods to reduce waste and costs. The inventory control practices adopted include; inventory management systems, inventory audits and inventory security.

Inventory audit as pointed by Lewis & Media (2014) in any organization ensures that there is adequate and efficient analysis of inventories. Hence audit includes the

procedure and policies laid in order to maintain standards as well as achieve the intended organizational objective in supply management through assessing and controlling existing inventory (Library and Archives Canada, 2014). Pasula, Nerandzic and Radosevic (2013) argued that internal audit of supply chain remain a powerful tool in reduction of operation cost and provide competitive advantage for the firm where risk are assesed and analyzed in supply chain.

Inventory management system is part of inventory control that ensure there is well are order and procedure in retrieving, storing and accessing information of inventory as pointed out by Ogbo (2014). An inventory flow system that are transparent and ensure smooth flow of inventory in supply chain were termed as efficient inventory system that optimize inventory management in supply chain (Musau *et al*, 2017). Museum (2015) proposed that inventory optimization function that are efficient can be achieved through utilizing electronic procurement systems. Internet based system served as real time processing inventory management system that ensure electronic procurement are adopted in public organization as pointed by Onchoke and Wanyoike (2016) in public institutions.

Inventory security is also an important aspect of inventory control practices which ensure that inventory is tracked and secured from theft or unauthorized access (Troxell, 2015). Lwiki *et al.*, (2013) pointed that proper document of inventory security protocol and procedure is important in ensuring inventory security. Kabuthi and Amuhaya (2013) indicated that stock marking activity, alarm systems, perimeter fences and

record keeping to manage security are handy in inventory security which is essential in supply management.

1.2.2 Supply Management

This is the process of getting products and service management that are required to run a business. The supply management elements include the information, products that are actual, employees and budgets. The reason of supply management process is to ensure that the cost is stable and the resources are used effectively to increase efficiency and profitability of the business or organization (Monczka, Robert, 2008). Supply management enables companies to raise their overall competencies in a similar way that outsources distribution and manufacturing are done. It gives the organization room to focus on their main competencies and network assembling of the best-in-class partner to contribute to the value itself. This, therefore increasing overall efficiency and performance of the organization. Materials management in the entire management from supplies to the supply chain. Retailers rely on supply management to swiftly deliver those products which are expensive to prevent holding costly inventories in stores for a longer time than required. They also assist in network design that satisfies customer services goals at the last total cost. Efficient supply management enable an enterprise to be competitive in the market place. Supply management offers techniques and tools that enable business organization to identify the challenges and also give solutions of these disruptions in the business environment (Ross, David, 2015).

There is expansion of global markets across borders and re-defining the management of demand and supplies are managed. Markets across continents are driven by Global

companies. To keep the production cost low, they are forced to keep looking at centres where there is cheap labour and raw materials. Sourcing of raw materials and vendors to supply the right quantity, right quality and at the right place calls for procurement strategy that is dynamic and span across countries.

1.2.3 Public and Private Universities

Supply management in private and public Universities is an important part responsible in ensuring teaching resources and statutory equipment are purchased as well as inventory management. This ensure smooth follow of learning in the Universities. Despite supply chain been trained in University, its application has affected the running of University from purchasing to inventory management. According to Kaaria, (2020) University institution dependent on procurement practice for smooth follow of supply chain which include inventory control practices. However, inventory control practices have reformed consistently where in Kenya the Public Procurement and Disposal Act of 2015 was enacted to assist in creating policies necessary in supply management.

According to Opio (2016) Public and Asset Disposal Act in 2015 further explained the best standards requirement in supply management which assist in public University supply management. Universities in Kenya has adopted different inventory control practices as result of growth in number of students affecting the purchases. Similarly, departments, library, classes, hostel among other facilities requires improvement in existing inventory control practices.

According to the University Act 2012 the Universities must be able to develop the education curriculum, be accredited with best standards and well governed through the use of commission of higher education. This implies there is need to improve inventory audit, inventory management system and inventory security to ensure smooth flow of service and required university inventory which is mandate of commission of higher education. Mwangagi and Achuora (2019) added that public Universities should adopt learn supply chain practices in order to improve on organization performance. However, the study did not examine the effect of inventory control practices to supply management in the Universities. Therefore, there is need to examine both public and private University in respect to inventory control practices and supply management.

1.3 Statement of the Problem

Inventory control is not only used by business to enable timely material availability but also to make sure there is a satisfactory service provision to gain competitive advantage. Internal inventory practices are used by many organizations to attain organizational goals and objectives to improve procurement operations. These inventory demands are achieved through the procurement departments in the organization. Procurement thus is important in provision of necessary goods and services to the customers in an organization by maintaining the level of stock at the most minimal costs possible. The essential of Inventory control is linked directly to how organization is successfully giving services to its customers. There has been an outcry in Universities procurement sector for lack of efficiency in their stock control. According to World Economic Reports and Social Survey 2019 indicate that there have been many challenges in coming up with a sound way of establishing the level of the stock required that

guarantee a free flow of goods and services without attracting a lot of resources in stocking such materials and without necessarily rendering any single stock out of date. Although many organizations have integrated inventory control practices to its management, there is limited knowledge on the relationship between inventory control practices and supply management. The researcher therefore isolated this gap as a topic of interest and analyse such relationship. The study therefore intends to investigate the relationship between inventory control practices and supply management in selected public and private Universities in Nakuru County, Kabarak and Egerton Universities which are private and public respectively.

1.4 General Objective

To establish the relationship between inventory control practices and supply management in selected public and private Universities in Nakuru County.

1.4.1 Specific Objectives

The study was guided by the following specific objectives:

- i) To establish the relationship between inventory audit and supply management in selected public and private Universities in Nakuru County
- ii) To examine the relationship between inventory management systems and supply Management in selected public and private Universities in Nakuru County
- iii) To determine the relationship between inventory security and supply management in selected public and private Universities in Nakuru County

1.5 Research Hypotheses

H₀₁: There is no significant relationship between inventory audit and supply management in selected public and private Universities in Nakuru County

H₀₂: There is no significant relationship between inventory management system and supply management in selected public and private Universities in Nakuru County.

H₀₃: There is no significant relationship between inventory security and supply management in selected public and private Universities in Nakuru County

1.6 Justification of the Study

Most of the organizations are facing issue with supply management which affect the end user customer. Hence there is need to examine inventory management in order to ascertain cost as well as efficiency in supply management. Although many organizations have integrated inventory management system, the research was conducted to examine the appropriate methods of inventory control that minimize the cost and enhance supply management. Since most of the items in the University are bought in bulk, the study assisted to calculate the appropriate stock levels that can be maintained economically.

1.7 Significance of the Study

The research study was a source of information to the shareholders to understand inventory control practices, their use and the practical importance in the organization. The study also enabled the inventory control managers in making decision that are

sound about the appropriate level of inventory to be kept so as to ensure the customers are given proper service level. It also enabled the staff of inventory control to come up with policies that are friendly and procedures for buying and controlling their inventory levels as well.

1.8 Scope of the Study

The research focused on inventory control practices and supply management in public and private Universities. The target population comprised of public and private Universities which has their headquarters established within Nakuru County. These Universities are Kabarak University which represent private and Egerton University which is a public University located in Nakuru County. The study was done within the period of 2021 to 2022.

1.9 Limitation of the Study

According to Best and Khan (2008) limitations are conditions that cannot be controlled by the researcher. The study encountered several challenges while conducting the research. Which include, use of self-administered questionnaire that had a limiting factor in terms of understanding the questions and filling incorrectly. However, this was resolved by ensuring detailed instructions given to the respondents. It is also expected that some of the respondents may find it difficult to willingly fill the questionnaires for the purpose of confidentiality and this was addressed through assuring them that it is for academic purpose.

1.10 Assumption of the Study

As Leedy and Ormrod (2010) posited, “Assumptions are so basic that, without them, the research problem itself could not exist”, the study was premised on several assumptions. First, on the primary data used, it assumed that the respondents selected took part in the study and they were willing to provide accurate information. Second, on the sample size selected of 89 respondents, it was assumed to be a representative of the study population made inferences to.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses empirical literature review, theoretical framework and conceptual framework.

2.2 Theoretical Review

Theoretical review outlines the relevant theories which was adopted in the study. This study adopted Economic Order Quantity Model, Stock Diffusion Theory and Resource Dependence Theory as discussed below.

2.2.1 Stock Diffusion Theory

This theory was founded by Braglia, Gabbrielli and Zammori (2013). It outlines the approaches used in controlling inventories in an organization. According to the theory, utilization of stock is modelled as a Markov process that has a diffusion term that is slow. Fokker Planck model is applicable when calculating the chances of dissemination of reorder time and stock utilization. Braglia, (2013) argued that to it makes it possible to keep safety stock at low level if inventory management is disbursed in this way. Similarly, according to Eaton (1999), posited that it makes sure that lower levels are kept without interfering with the operational of internal organization of the inventory costs.

Replenishment of stock is driven by policies in the public procurement which entails the Asset Disposal Act and Public Procurement, 2015. Stock control shows the amount of stock that an enterprise should contain at any given time and it makes sure that the level of stock is maintained by acquiring materials. There is need to develop control of inventory system in such an uncertain environment that enables a real and direct flow of information that is timely on materials; information flow between the organization and suppliers. This theory has a link with the study as it makes sure that every organization shall develop internal structures, procedures and policies in which it is based on all inventory control operations (Eaton, 1999).

2.2.2 Resource Dependency Theory

This theory was developed in 1970 by Jeffrey, Pfeffer, and Gerald. The theory is supported by the fact that for any organization succeed there should be enough resources and that access and control over resources on basis of power. According to (Mito, 2015) resource dependency theory, firms seek to manage dependence and reduce risks by intentionally re-structuring their relationship exchange, establishing relationship that are formal and informal with other firms' through the development of linkages, incontinences due to market dynamics can be reduced by the organizations. Angel, (2005), argued that the theory is applicable in control of internal inventory by many institutions. Including the relationship that is long term between the supplier and customer, the organization can protect from internal and external organizations and even changes of environment and be able to enhance maximum inventory control (Kitaeva, 2014).

This theory is underpinned on the following axioms; the first assumption is on organizations rely on resources for smooth running, secondly, the resources are sourced from outside the organization. Thirdly, the resources are competitive and scarce and thus needs the organization to have decisions that are strategic to be made on the quantity to buy, on what to buy and at what time. Lastly, the theory is interlinked to the power of the organization that is rational, situational and interdependent (Gerald, 2010).

The theory looks on the way the resources that are not inside the organization affect the smooth running of the firm internally. Activities of procurement in firms and the control of those materials which are procured is important in procuring resources that the organization will use (Pfeffer and Salancik 1978). The theory suggests that there must be structures internally that is well formulated and coordinated in an organization via proper communication systems and should be aligned to organizational strategy. It is important to develop policies internally in an organization and processes that guide sourcing of the resources required in daily running of the activities of an organization. The policies are crucial in sourcing of materials and decision control. Similarly, there is inadequacy of the system of information that is well-managed and allows the flow of inventory information at the right time among the external stakeholders and the organization (Hurley, 2007). Therefore, this theory has a relationship with the study as it seeks to reduce uncertainty in inventory control in the University.

2.2.3 Theory of Economic Order Quantity (Wilson's EOQ Model)

This theory was brought about in 1913 by Haris and can also be referred to as Wilson EOQ model, who did critical analysis of the model (Ogbo, 2011; Ogbo and Onekanma,

2014). Harris is within operation management authors who have come up with models to establish the maximum levels of inventory that the organization must keep. Blackburn, (2010) agreed that this model is commonly applied in many industries when managing inventory. The use of the model has shown a decline in some cost and an increase in others. The cost of ordering declined with the holdings of inventory, whereas holding costs rose and the associated cost to total inventory costs curve at a lower point. This point can also be referred to as the minimization total inventory cost point. Economic order quantity is the level of inventory that the total of inventory holding costs and ordering costs are reduced (James, Samson and Mbura, 2018).

Coleman (2002) and Ogbo (2011) defined this model as the model that order amount of quantities which reduce the cost balance between re-order cost and inventories holding cost. Assumptions of the model that Ogbo (2011) describes include; that holding costs stock are constant and known; constant ordering costs is known; the demand rate are constant and known; there is known and constant time lead cycle; the unit price constant; the replenishment is made instantaneously, there is delivery of the whole batch at once and no stock-outs are allowed. One challenge of EOQ is that it does not take into consideration of safety stock which are kept to cater for difference in lead-time (Kyalo, Charle and Iravo, 2019).

The EOQ holds that for each and every item stocked in stores there should be a determination level of orders and it should be cost effective. The EOQ model suggests that even though risk and uncertainties are regular and common in all business all other variables should be kept constant. For instance, some of the uncertainties in this model

include demand change, damage at the time of transportation and delivery delays, therefore, demand Uncertainty will force the model to be altered to moderate against uncertain business atmosphere (Oballah, Waiganjo and Wachiuri, 2015).

Due to experienced business atmosphere altered economic order quantity, where there is common occurrence in fluctuation demand EOQ model can be used. The model is mostly applicable in organization where the demand cannot be accurately projected due to its dependence on several external factors. Considering resource management, there are other factors that affect inventory level. These factors can influence the activities being carried out in the University (Ogbo and Onekanma, 2014).

In place where all the axioms are met it can be considered ideal as previously discussed on the EOQ restrictive assumptions. The EOQ model should be designed to adapt with the uncertainty in demand that is encountered in most situations. Therefore, the model is relevant in the study as it seeks to establish the maximum inventory levels that should be kept by the organization.

2.3 Empirical Review

The study reviewed related literatures on inventory audit, inventory management systems, inventory security and supply management.

2.3.1 Inventory Audit and Supply Management

Inventory audit is believed to be a concept of inventory management and accounting practitioners. Lewis & Media (2014), argued that audit of inventory in any organization ensures that there is adequate and efficient analysis of inventories. Audit of inventory reduce the loss in inventories and enables accuracy of inventory. According to Johnstone (2013) audit of inventory ensures that an organization do away with those risks which are related to inventory; inaccurate and incomplete inventory records, poor inventory security, unnecessarily high inventory levels, obsolete inventory and inadequate and inappropriate inventory.

It is beneficial to take into consideration audit of factors such as the costs used in the control of inventory systems and practices rather than auditing inventory control practices. Moreover, it is of benefit if audit is carried out in the level of conformity with industrial and organizational practices of procurement. According to European Academy for Taxes, Economics & Law (2015), practices in the inventory control should go hand in hand with the direction of organization strategic, internal procurement and stores objective. Audit of inventory control if managed very well can lead to enhanced control of procurement successfully and in return procurement performance.

Audit of inventory control takes into consideration both procedures and policies put down and generated to make sure they comply with industrial standards and organizational, whether there is communication and proper understanding of inventory

control policies and procedures by those employed implementing it, whether controls are in order to successfully undertake risk management that are in line to inventory control, whether there is body that looks on it and if it receives crucial information regularly allow for proper monitoring of goals, plans and results that are in line to inventory control, and if the results expected in inventory control are defined soundly and a follow up made (Library and Archives Canada, 2014).

Onchoke and Wanyoike, (2016), in their research, analysed the determinants of stock control practices and procurement performance of Agro-chemical Distributors in the sub-county of Nakuru Central. It surveys the existing correlation between procurement performance and internal control specifically in the field of agrochemical distribution. The research used cross-sectional survey design in that the research was conducted at a single time and the primary data was collected. The study targeted all employees working in the distributing firms. The instruments for collection of data were structured questionnaires, and data was analysed using both descriptive and inferential statistics. The results from the study indicated a significant effect of inventory audit practise on procurement performance. The current study focused on inventory audit on supply management rather than procurement performance.

Lewis and Media (2014) postulated that the sole importance of embracing inventory audit is to enhance timely as well as enough identification of inconsistencies and evaluation. The study found that by conducting an Inventory audit, there are minimal inventory losses since accuracy has been greatly enhanced. Hence there is a reduction of any imbedding risks not limited to inappropriate and inadequate inventory, high

inventory levels that are unnecessarily, incomplete and inaccurate inventory records, inadequate security of inventory and out of date inventory. Therefore, the current study while hinging on these findings, as a continuation of the reviewed study, sought to probe the correlation between inventory control practices and supply management in public and private Universities.

Pasula, Nerandzic and Radosevic (2013) examined internal audit of the supply chain management. The supply chain was examined based on the function of reducing cost of the company. However, internal audit of supply chain remain a powerful tool in reduction of operation cost and provide competitive advantage in the global market in times of economic crisis. The study purpose was to examine internal audit activities in assessing risk and analyzing the functioning of the supply chain. Internal audit is crucial in making recommendations for enhancing effectiveness and efficiency of operations and ensure that management attained the set goals. The paper found that internal audit enhance supply mangement in reducing the cost of the companies. The current study focused on examining the effect of internal audit on supply management.

2.3.2 Inventory Management Systems and Supply Management

Ogbo (2014) examined the relationship between organizational performance effectiveness and inventory control system in the 7-up bottling company. A sample of 83 respondents was chosen to be representative of the target population. The study indicated that flexibility in inventory control management is crucial way to attaining results in an organizational. The results also showed that organizations importance from inventory management system through retrieval of material and easy storage, reduced

operational cost and improved sales effectiveness. It also revealed that there is correlation between feasibility of operation, satisfaction of inventory control management when it comes to cost effectiveness technique and issues related to customer of the organization that are executed to enable the revenue generation in an institution. Good management inventory control is seen as the crucial areas that management of any organization should acquire capability. Automated inventory keeping method is recommended as the best method that suit operations in any organizations. Nonetheless, the research aimed on organizational performance while this research focused on inventory control practices and supply management.

Museum, (2015) conducted a study in Kenya to investigate on inventory maximization on performance of electronic-procurement of state parastatals. The study used cross-sectional survey design. The study used quantitative and qualitative research methods. The 380 was the target population drawn from 190 state parastatals in Kenya. The study used cluster random sampling to select the respondents and questionnaires were utilized for primary data collection. The data collected was analysed using both descriptive and inferential statistics with an aid of SPSS software. The data was shown by frequency distribution tables, bar charts and pie chart. The results indicate that, there was a positive relationship between inventory levels and procurement performance in state corporations. Further, it revealed that, inventory maximization level plan is not negative always when those demand which cannot be achieved are lost. The study suggested that the inventory maximization plan function should arise from the need to maintain the right order fulfilment. It is difficult for demand conditions to match with that of supply management expectations as either some supply management members were required hold high levels of inventory. This study investigated the role of

inventory maximization on electronic-procurement performance while the current study investigated on the relationship between inventory control practices and supply management.

Kithae and Achuora (2017) did a study to establish the impact of management inventory on performance of the private commercial banks. The descriptive research design approach was employed. Two hundred and twenty (220) procurement officers was the targeted population in the private commercial banks in Kenya and from the population of 142 respondents were chosen using systematic random sampling. The data collected was analysed using inferential and descriptive statistics and regression model was employed to portray the relationship between the dependent and independent variables. The researchers opined that inventory cycle counting has a significant effect on performance in commercial banks. It was concluded that inventory control techniques, technology, and inventory cycle counting has a positive correlation with performance in private sponsored commercial banks. The study suggested that private institutions must enhance inventory management practices so as to boost their performance. However, the study did not consider inventory control practices in public institutions hence reason for this study. Current study used correlation research design.

Ondieki *et al*, (2015) did a study in Kenya on the impacts of the warehousing inventory systems management on procurement in Seventh day Adventist institution's financial performance. The 216 employees were the target population of the study which a sample of 64 employees were chosen using stratified random sampling. The collected data was analysed using regression and correlation statistics. The study showed

significant relationship between financial performance and inventory warehousing systems. The researcher recommends that organizations managers should enhance successful inventory warehousing systems as a way to increase their financial position and in the entire organization performance. This study therefore focused on the relationship between inventory control practices and supply management.

Musau *et al*, (2017) examined on the impacts of management inventory on performance of organizational among textile manufacturing firms. The study used the convergent parallel mixed method and 196 respondents was the target population. They used simple as well as stratified random sampling techniques in selection of a sample of each stratum. The interviews and questionnaires was used as the instruments for data collection, and data was analysed using correlation with the aid of SPSS Version 22. The results were shown by use of table, graphs and charts. The researchers opined that inventory management adoption is a factor of supply chain that determines performance of textile manufacturing firms. It was concluded that inventory management influence performance of textile firms positively and therefore identifies its importance in the supply chain and have come up with mechanisms and invested in current material flow systems to oversee and transparent and smooth material flow than can be checked along a supply chain. Therefore, the current study while hinging on these findings, as a continuation of the reviewed study, seeks to probe the correlation between inventory control practices and supply management.

Systems enhanced by internet and inventory operations integrated with supply management was of importance to businesses and stakeholders as a whole. Inventory

management system is important in carrying out implementation of electronic-procurement mostly in public institutions and also in the large organization. In public organizations, the system of inventory management is applicable in attaining social as well as economic reforms in public organization are very keen to apply corporate social responsibility. For those organizations who intend to come up with management inventory systems in trial to enable supply management, there is need to master supply management can be enhanced by such systems (Onchoke, and Wanyoike. 2016).

2.3.3 Inventory Security and Supply Management

To ensure inventory security within the organization, organizations should develop formal and structured methods. If those who handle inventory and those specialists in storage have to progress in making sure internal inventory security, then they have to contain a documented procedure on inventory security. Procedures in the internal inventory are practices that are documented by the management to help in the inventory security internally within an institution (Troxell, 2015). These practices can also be termed as internal inventory prevention loss practices (SuperCuts, 2014). Since these practices are put down on paper, some of it can be developed by an organization in the as a check lists to make sure that there is expected control practices of internal organizational (Lwiki *et al*, 2013). These practices entail; keeping of records that are documented, procedural stock taking and stock marking, procedural inspection that is documented procedures for checking stock (Jolla, 2014).

Lwiki *et al*. (2013) conducted a study in sugar process in companies in Kenya on the impact of inventory management practices on financial performance and the study

showed that even though the factories were applying similar inventory management practices, the effectiveness of these practices are different across all the sugar factories under study. The study adopted survey research design which was used across the eight operating sugar companies between 2002 and 2007. Semi-structured and Structured questionnaires were employed to collect data from the key informants in the organization. To test the effect of inventory management practices descriptive statistics was used and relationship among inventory variables was tested using correlation analysis. The results showed a positive correlation between the organization and inventory control. Proper documentation of inventory security control practices procedure that are developed basing on the organization performance was among the recommendation of the researchers. However, this study investigated on inventory control practices and supply management in public and private Universities.

Kabuthi and Amuhaya (2013) examined on inventory security practice on organization procurement performance. The study focus on clearing and forwarding firms that are established in Nairobi County. The study utilized descriptive research design which adopted questionnaires. The result indicated that inventory security practice had a statistical relationship with safety performance. However, inventory security procedural practice statistically affected the level of security measures. The results further indicated that outsourcing was done by number of firms to improve inventory security practices as a strategy to reduce challenge of shortages. Equally most of the firms used stock marking activity, alarm systems, perimeter fences and record keeping to manage their security inventory requirements. The current study focused on inventory management and supply management.

Owuoth and Mwangi, (2015) carried out a research in Kenya on stock control. The study showed poor procedural practices adoption as shown in the procurement act and regulations in public sector has led to low performance in procurement. The study actually found out that public entities should use what is provided in the procedural documents to come up with policies that concur with their environment rather than adopting the procedures provided.

From the time the procurement act in 2005 was enacted and public procurement regulation development in Kenya, practices given in the act and procurement regulation has been used to handle the process of procurement that enable the procurement activities to be controlled by the procurement entities (Thai, 2017).

2.4 Conceptual Framework

Leshem and Trafford (2007) pointed the need for diagrammatic representation of the dependent and independent variable. In the study, stock control practices are the independent variables and supply management is the dependent variable. Where the independent variable stock control practices are measured using inventory audit, inventory management system and inventory security. The dependent variable, supply management is measured using inventory turnover, lead time and effectiveness.

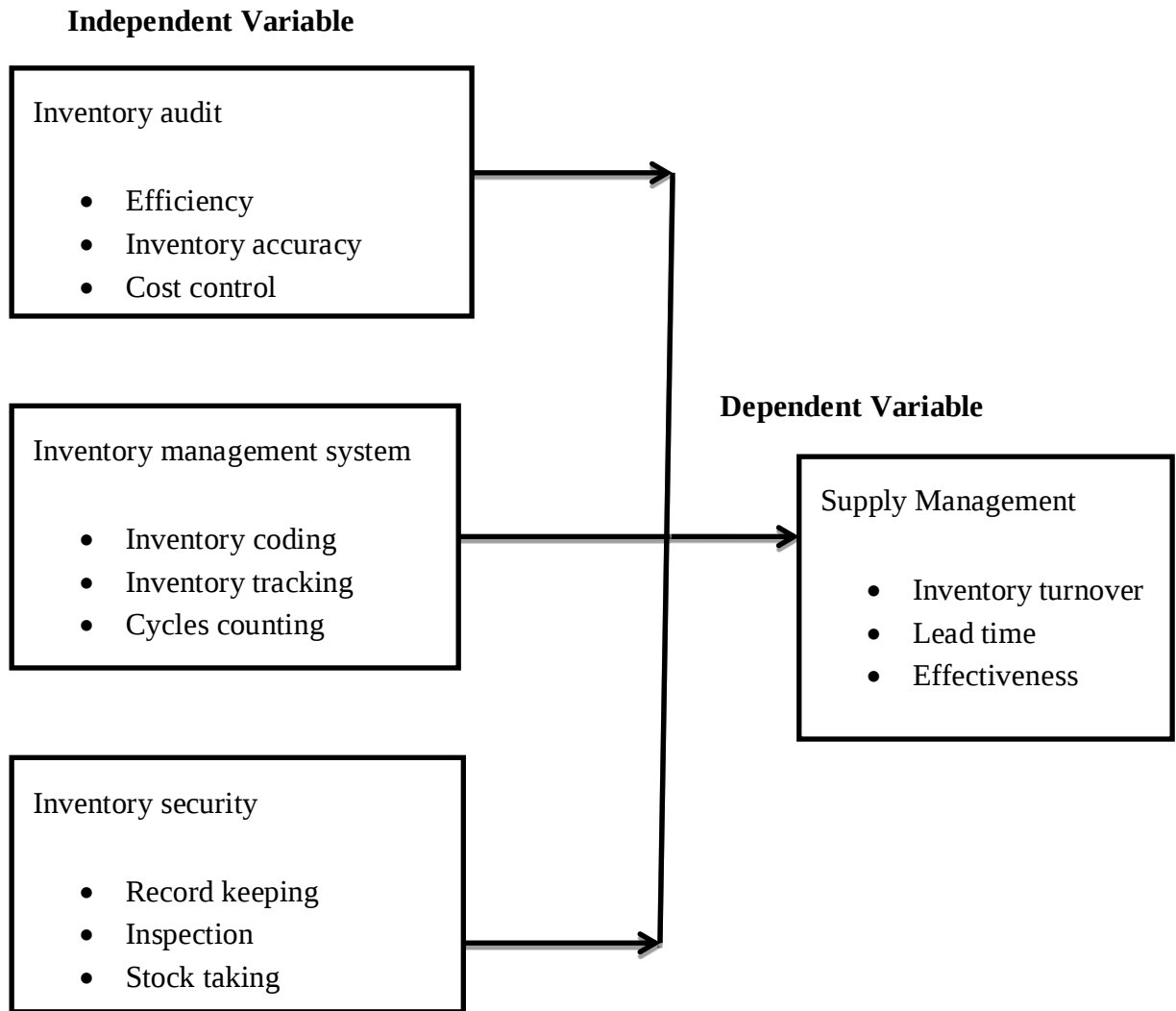


Figure 2.1: Conceptual Framework

2.5 Knowledge Gap

This chapter has brought about various views on the relationship between supply management and inventory control practices. Onchoke and Wanyoike (2016) evaluated the effect of procurement performance and inventory control practices of agri-chemical distributors in Nakuru County. They adopted cross sectional survey research design in their study and it focused on procurement performance. The current study utilized correlation design and it focused on supply management. Other studies have been carried out to show relationship of inventory control practices and other factors of

performance of organizational for example economic, operational and financial performance, majority of these studies have looked on external inventory control practices. For example, Ogbo, (2014) carried out a study in Nigeria on impacts of effective inventory control management on organizational performance. A sample size of 83 respondents was selected to represent the population. This study was carried out with a sample size of 89 respondents in Kenya.

Musau (2015) researched on inventory optimization on electronic-procurement performance of state parastatals in Kenya. The research used a cross-sectional survey design with a population of 380 employees. A cluster sampling technique was used to choose the respondents. The current study utilized correlation research design having a target population of 115 employees and it employed multistage sampling to select the respondents who actually took part when collecting the data.

Kithae and Achuora (2017) did a study in Kenya on the determinants of management inventory of the private commercial banks. They employed descriptive research design in the study and simple random sampling technique was employed to choose the 142 respondents from the commercial banks. The current study employed a correlation research design with a sample size of 89 respondents. It also looked on inventory control on supply management. Another study by Ondieki (2018) on the impacts of management of warehousing inventory systems on financial performance focused on seventh day Adventist institutions. The study was conducted using stratified random sampling technique on 64 employees of seventh day Adventist in Kenya. The current

study focused on learning institutions with a population of 115 and a sample size of 89 respondents.

Lwaki (2013) did a research in Kenya on influence of inventory management practices on financial performance of sugar companies. A survey design was used to conduct the manufacturing firms from 2002-2007 period. The study also adopted Descriptive and correlation. The current study adopted only correlation research design. According to Jessop and Morrison (2010), inventory control involves determination of the principles and procedures for maintaining inventory at the appropriate levels to meet operational needs. In most organizations, high level of commodity availability has habituated employees resulting in higher stock holding levels (Osei-Mensah, 2016).

According to Kyalo, Iravo, and Maurice (2019), inventory control if not managed efficiently may have far reaching effects. Some of the problems that may be encountered includes; pilferage, misappropriation, obsolescence and stock deterioration. An efficient inventory control may involve procuring items at the right time, quality, quantity and price (Kyalo, Iravo, and Maurice 2019). A well planned and effectively controlled stock can contribute to the effective operations of an organization. The basic challenge of stock control is to determine the stock levels that work most effectively with the operating system (ibid).

Richards (2017), the reason why stock is maintained is to circumvent running out of stock which eventually results to challenges. The size of the stock is determined by the

needs of operational, capital availability, deliveries of stock time, storage cost and the need for records which are detailed and kept through the use of store record in the form of stock issues. Stock level of each material can be set after consideration of availability of funds, availability of storage facility, consumption rate of materials, time lead and safety margin (Hugos, 2018). The level of Inventory must be shown on the records of inventory and no items issued unless it is covered by materials requisition form.

Osei-Mensah, (2016) in his study showed that the variability and uncertainty of the content and timing of flow of information and the flow of goods causes planning uncertainty, increased costs, stock run outs and delays. Therefore, there is need to take precautions on inventory to overcome the uncertainties and dynamics on the operational level of business. However, this cannot be possible without strategic and tactical plans in an organization which steers excellence.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter provides the research design, study context, target population, and sampling procedures. Methods of data collection, as well as instruments of data collection and recording, are also described. Last but not least, data analysis and presentation of findings is discussed.

3.2 Research Design

Positivism approach of philosophy was adopted which ensures that information is extracted from its original setting without interference. In order to do so correlational and cross-sectional research design was adopted. The design entails collection of data to establish the extent to which the relationship exists between two variables or more. This comprises of data collection to determine if there is a relationship between variables that are quantifiable (Saunders, Lewis, & Thornhill, 2011). The study sought to establish the relationship between inventory control practices and supply management. Cross-sectional research design allowed the researcher to acquire data within a stationary time frame. This permits data to be studied to capture the specific phenomenal at a snapshot of time.

3.3 Location of the Study

The study was done in private and public Universities established within Nakuru County. Public and private Universities have been centre of procurement and financial frauds which affected the performance of the Universities. Nakuru County was preferred because it is a cosmopolitan town with vibrant economic development. Kabarak and Egerton were used as unit of analysis respectively. The County has two Universities; the Egerton University (public) which was started in 1934 and located in Njoro, approximately 20 kilometres from the town of Nakuru and the Kabarak University (private) also 20 kilometres from the town of Nakuru on the Nakuru–Eldama Ravine road. The two Universities were selected because they had the characteristics that the study sought to investigate and the institutions were easy to access.

3.4 Target Population

A population is defined as a set of individuals that a researcher may wish to draw a conclusion from it (Mugenda and Mugenda, 2003). In this study, the target population refers to public and private Universities which their headquarters are located within Nakuru County and they include Egerton and Kabarak University. The target population was 72 procurement officers and 43 store clerks where 47 are from Kabarak University and 68 are from Egerton totalling to 115 participants.

Table 3.1: Target Population

Management Level	Kabarak University	Egerton University	Population
Procurement officers	28	44	72
Store clerks	19	24	43
Total	47	68	115

3.5 Sampling Procedure and Sample Size

According to Kothari, (2011) sampling is defined as a technique of selecting a subset of the population to make statistical inferences and estimate features of the whole population. It entails selection of respondents in such a way that the selected participants are representative of the entire population.

3.5.1 Sampling Procedure

Multistage sampling procedure was employed in the study. In the first stage, purposive sampling procedure was employed to select on the two institutions in the County which include Egerton and Kabarak. This represent Universities that are dominant in Nakuru County. In the second stage, stratified sampling technique was used where procurement officers and store clerks were treated as strata. This allowed a propositional representation of procurement officers and store clerks which provided reliable information of inventory control practices as well as supply management in the Universities. Finally, from the stratus simple random sampling was adopted to select the number of participants who took part in the study. These procedures are preferred

because it allows sample representation and takes care of all characteristics of the sample.

3.5.2 Sample Size Determination

The size of the target population always influenced the required sample size, the sample seeks to be a representative of the number of variables in the data collection tool, the requirement for statistical analysis and the degree of confidence required from the findings (Wolf, Harrington, Clark and Miller, 2013). Taro Yamane's formula (Yamane, 1973), helped in getting the sample size. The formula is as shown:

$$n = N / (1 + Ne^2)$$

$$n = 115 / (1 + 115(0.05^2)) = 89$$

n = sample size

N = population

e = error of sampling method = 0.05

Table 3.2: Sample Frame

Management Level	Kabarak University	Sample	Egerton University	Sample
Procurement officers	28	22	44	34
Stores clerks	19	15	24	19
Total	47	36	68	53

Hence a sample of 36 and 53 from Kabarak University and Egerton University respectively making a sample of 89 respondents.

3.6 Data Collection Instruments

The study employed questionnaires to collect primary data. Questionnaires are written questions to be answered by respondents to collect the desired information. Structured and unstructured questionnaire was adopted to yield quantifiable data. The questionnaire was used in this study since it is believed to be an effective way of generating data in large amounts to reach a large population, it is easy to administer (Robson, 2002; Mugenda and Mugenda, 2003). The questionnaire was used to collect information from key players in the University. Instructions were given on how to address every question. Five-point Likert scale was used as follows: Strongly Agree (SA) – 1, Agree (A) – 2, Neutral (N) – 3, Disagree (D) – 4 and Strongly Disagree (SD) – 5.

3.6.1 Validity

It explains how well an instrument can measure what is required to measure (Kombo and Tromp, 2006). It is the degree of accuracy of the results analysed from the phenomenon under study. The validity of this study was ascertained by consulting with the supervisors from the area of specialization. The researcher together with the supervisors went through the questionnaires before distribution in order to uphold content validity.

3.6.2 Reliability

This is the degree to which a research instrument yields consistent results when there is a repeated trial (Mugenda & Mugenda, 2003). It deals with the accuracy and consistency of events of data assigned to different occasions on the same category

(Hammersley, 1992). In this study reliability was given by piloting the questionnaire in a different County with different group of participants who did not contributed in the actual study. University of Kabianga in Kericho County was picked for piloting because it has similar characteristics with the targeted county. The data was analysed using Cronbach alpha coefficient that is from 0 to 1. The coefficient value of 0.7 or more was deemed acceptable (Cohen, Manion and Morrison, 2005). The reliability of the instrument was also tested using Cronbach's Alpha as summarized in Table 3.3.

Table 3.3: Reliability

Variable	Cronbach's Alpha	Number of Test Items
Inventory Audit	0.832	5
Inventory Management System	0.754	5
Inventory Security	0.851	5
Supply Management	0.906	5
Average	0.836	

Reliability was examined on inventory audit with Cronbach alpha of 0.832, inventory management system with Cronbach alpha of 0.754, inventory security with Cronbach alpha of 0.851 and supply management with Cronbach alpha of 0.905 which were above 0.7. According to Cohen, Manion and Morrison (2005) Cronbach's Alpha coefficient above 0.7 implies that the instrument is reliable. Since all the coefficient were above 0.7 the instrument was reliable.

3.7 Data Collection Procedures

Babbie, (2015) defined data collection as using different sources of data that can be secondary or primary to solve an existing problem. Relevant permission was sought from the institution before conducting the research. The researcher therefore used drop and pick method whereby the researcher physically distributed the questionnaires to the participants in each institution with the intention of collecting them after three days. The respondents were assured that all information was kept confidential.

3.8 Data Analysis and Presentation

Data analysis is a crucial task that involves organizing, calculating and presenting summary both using graphs and tables based on the research questions (Bryman and Cramer, 1997). Analysis of data was done using both quantitative and inferential statistics with the aid of computer statistical packages such as SPSS version 21 and presented in the form of descriptive statistics. Descriptive statistics describe patterns and general trends in a set of data. Simple and multiple linear regression model was considered appropriate as an inferential tool that established the relationship between the variables. Hence, the study utilized simple regression analysis in testing the hypothesis. This provided the r value which is correlation coefficient, r square value which is coefficient of determination, f -value and t -value which assisted in testing the significant of the relationship between variable.

3.8.1 Simple and Multiple Regression Model

Simple regression represented by model 1, 2 and 3 were used to test hypothesis H_{01} , H_{02} and H_{03} respective. While model 4 represented the overall effect of inventory control practices on supply management. The linear regression model shown below was adopted;

$$Y = \beta_0 + \beta_1 X_1 + e \text{-----Model 1}$$

$$Y = \beta_0 + \beta_2 X_2 + e \text{-----Model 2}$$

$$Y = \beta_0 + \beta_3 X_3 + e \text{-----Model 3}$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \text{-----Model 4}$$

Where;

Y = Supply Management

β_0 = Constant Term

$\beta_1, \beta_2, \beta_3,$ = Coefficients of Beta

X_1 = Inventory audit

X_2 = Inventory management system

X_3 = Inventory security

e = Error Term

In the model β_0 is the constant term and $\beta_1, \beta_2, \beta_3,$ measure the influence of the dependent variable Y to the unit change in the independent variables $X_1, X_2,$ and X_3 . The e represents an error term which is unexplained in the model.

3.8.2 Diagnostic Test Results

Assumption was diagnosed to enable utilization of regression model. The assumption included normality, multi-collinearity, autocorrelation and homoscedasticity were examined before using multiple regression analysis. Kolmogorov-Smirnov test was used and a threshold above 5% significant indicated that the distribution was normality distribution. Autocorrelation was tested using Durbin-Watson with threshold between $1.5 < d < 2.5$ had no autocorrelation. Multi-collinearity was analysed using variance inflation factor (VIF) with test criteria was given by $VIF < 5$ for no multi-collinearity (Meryer, Guarino and Gamst, 2007). Homoscedasticity was verified using Levene's test with threshold of less than 5% for existence of equal variance (Hair, 2014). The results in Table 3.3 were used to summarize the assumption of multiple regression.

Table 3.4: Test of Normality, Multi-Collinearity and Homoscedasticity

	Kolmogorov-Smirnov ^a			Shapiro-Wilk			Collinearity Statistics		Levene's Test	
	Statistic	Df	Sig.	Statistic	Df	Sig.	Tolerance	VIF	Statistics	Sig.
Supply management	.302	73	.198	.814	73	.091				
Inventory	.293	73	.093	.836	73	.128	.467	2.14	19.483	0.109
Audit								2		
Inventory	.289	73	.090	.872	73	.209	.362	2.76	64.719	0.193
Managemen								4		
t System										
Inventory	.248	73	.084	.904	73	.213	.318	3.14	26.611	0.165
Security								9		
a. Lilliefors Significance Correction										
Durbin-Watson										1.546

Table 3.3 revealed that there existed no multi-collinearity ($VIF < 5$ or $Tolerance > 0.2$). Kolmogorov-Smirnov examined normality in the distribution and established that

inventory audit, inventory management system, inventory security and supply management were normally distributed ($p > 0.05$). Levene test result revealed that inventory audit, inventory management system and inventory security had homogeneous variance on supply management ($p > 0.05$), these indicated that homoscedastic along the regression line.

Autocorrelation was established using Durbin-Watson and the results indicated that there was no autocorrelation between inventory audit, inventory management system and inventory security with supply management ($1.5 < d = 1.546 < 2.5$). Their results allowed the multiple linear regression model to be used for analysis.

3.9 Ethical Considerations

Research permit was obtained from University of Kabianga IERC. The letter was used to apply for permit from National Commission of Science, Technology and Innovation (NACOSTI). Ethical standards pertaining the respondents and conduct of research was adhered to throughout the research process. No respondent was coerced or lured to participate in the research. Their consent was sought by revealing the purpose of the study, what the study entails, and foreseen benefits. Their identity was protected by using codes instead of names in the research instrument. The researcher assured the respondents on the confidentiality of the study by assuring that information provided was purely for academic purposes only.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATIONS AND DISCUSSION

4.1 Introduction

This section provides descriptive and inferential analysis which provides results that examine the relationship between inventory control practices and supply management in selected public and private Universities in Nakuru County. The section entails response rate, the reliability test results, the demographic information, the descriptive statistics and the inferential statistics.

4.2 Response Rate

A response rate of 86% where 76 out of 89 questionnaires were responded. Mugenda and Mugenda (2003) a responds rate of 70% was excellent for data analysis. This were presented in Table 4.1 below.

Table 4.1: Response Rate

Questionnaires	Response	Percentage
Responded	76	86%
Non-responded	13	14%
Total	89	100%

4.3 Demographic Results

Gender, age, level of education and duration the institution had operated and number of employees in the institutions. The results were presented using frequency table.

4.3.1 Gender of Respondents

The gender of the respondents was determined and presented in terms of frequency and percentage. The summary was presented in Table 4.3.

Table 4.3: Gender of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	39	51.3	51.3	51.3
	Female	37	48.7	48.7	100.0
	Total	76	100.0	100.0	

According to Table 4.3 the male respondents were 51.3% and female were 48.7%. However, there was little difference between the male and female employees in the organization. This is associated with cultural setting of African countries where majority of male are given upper hand in education and in social setting.

4.3.2 Age of Respondents

Demographic age in years was determined and presented in term of percentage and frequency. These were summarised in Figure 4.1 below.

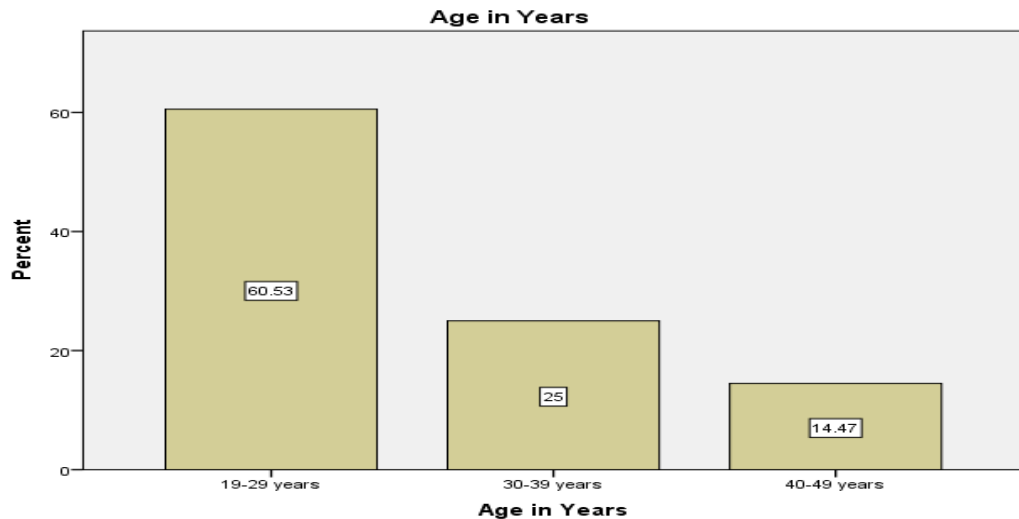


Figure 4.1: Age of the Respondents in years

Figure 4.1 age of the respondents was distributed between 19-29 years with 60.5%, 30-39 years with 25.0% and 40-49 years with 14.5%. The results indicated that, all the age categories were represented in the study.

4.3.3 Level of Education

Level of education were presented in Table 4.4. These explains different level based on frequency representation and percentage of demography.

Table 4.4: Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
	Tertiary Certificate	7	9.2	9.2	9.2
	Diploma	40	52.6	52.6	61.8
Valid	Undergraduate Degree	21	27.6	27.6	89.5
	Masters	8	10.5	10.5	100.0
	Total	76	100.0	100.0	

Table 4.4 revealed that 52.6% were diploma holders, 27.6% had degree, 10.5% had masters and 9.2% had tertiary certificate. The results indicate that there is high literacy level in the institutions, this means that the respondents were in a position to understand the questionnaire and to give appropriate response.

4.3.4 Duration of Operation

The institution was examined on basis of its operation. The summary of the result in term of percentage were presented in Figure 4.2.

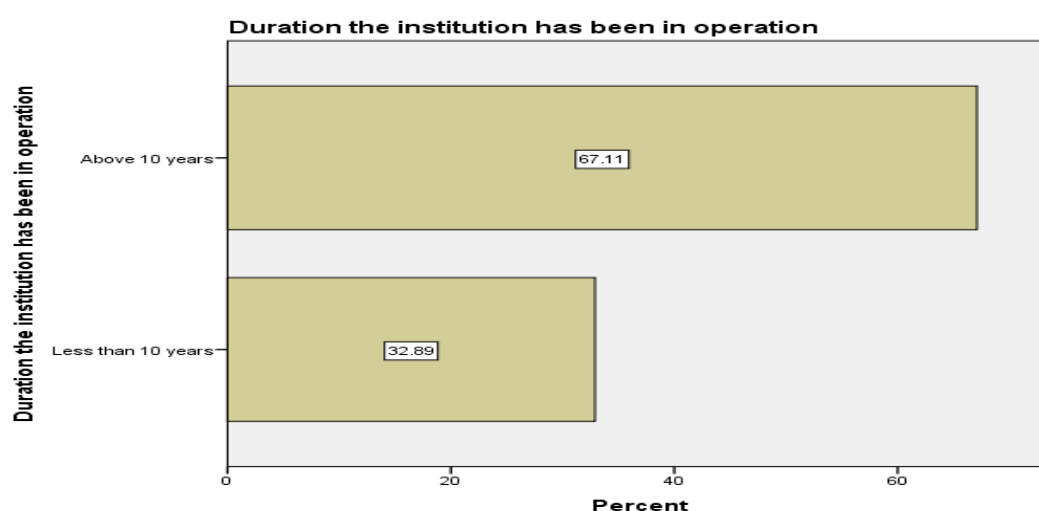


Figure 4.2: Duration the Institution has been in Operation

Figure 4.2 indicated that 67.1% of the institutions had been in operation more than 10 years. However, 32.9% had less than 10 years of operation in the institutions. Hence, most of the institutions had experience based on over 10 years' operations.

4.4 Descriptive Statistics for Inventory Control Practices and Supply Management

Descriptive statistics used mean and standard deviations based on the Likert scale of 1 as strongly disagree to 5 as strongly agree. The results were evaluated where a mean above 3 indicated agreeability or satisfactorily and otherwise disagreeability or unsatisfactorily. While a standard deviation below 1.0 revealed low variation which implied homogeneity in respondents.

4.4.1 Inventory Audit

The first objective determines the relationship between inventory audit and supply management in selected public and private Universities in Nakuru County. The analysis entail descriptive statistics results for inventory audit were analysed using mean and standard deviation. The summary results were presented in Table 4.5.

Table 4.5: Descriptive Statistics for Inventory Audit

INVENTORY AUDIT STATEMENTS		SA	A	N	D	SD	Min	Max	M	Std. D
1.University conduct inventory audit efficiently	%	25.0	53.9	21.1	0.0	0.0	1	5	4.0395	0.68197
	F	19	41	16	0	0				
2. Inventory audit are done well to ensure accuracy in recording	%	19.7	44.7	25.0	10.5	0.0	1	5	3.7368	0.89990
	F	15	34	19	8	0				
3. Cost are well controlled to ensure reduction of wastage and mismanagement of resource in the University.	%	26.3	39.5	18.4	15.8	0.0	1	5	3.7632	0.91808
	F	20	30	14	12	0				
4. Inventory audit are done periodically to ensure all University property and resources are secured	%	9.2	51.3	23.7	15.8	0.0	1	5	3.5395	0.87087
	F	7	39	18	12	0				
5. Inventory audit have ensured that there is sufficient inventory turnover to avoid shortage, losses and wastage.	%	21.1	30.3	32.9	10.5	5.3	1	5	3.5132	0.90143
	F	16	23	25	8	4				
Aggregate									3.7184	0.71567

According to the results in Table 4.5 majority of the respondents 41(53.9%) agreed that University conduct adequate inventory audit efficiently while 19(25.0%) of the respondents strongly agreed and 16(21.1%) of the respondents were neutral (M= 4.0395, Std = 0.68197). It was also revealed that majority of the respondents 34(44.7%) agreed that inventory audit was done well to ensure accuracy in recording, while 19(25.0%) were neutral, 15(19.7%) strongly agreed and few 8(10.5%) disagreed (M=3.7368, Std= 0.89990). The results revealed that majority of the respondents 30(51.3%) agreed that cost was controlled to ensure reduction of wastage and mismanagement of resource in the University, 20(9.2%) strongly agreed, 14(23.7%) were neutral and 12(15.8%) disagreed (M=3.7632, Std= 0.91808). Majority of the

respondents 39(51.3%) agreed that inventory audit was done periodically to ensure all University property and resources are secured, however, 18(23.7%) were neutral, 12(15.8%) disagreed and 7(9.2%) strongly agreed ($M=3.5395$, $Std= 0.87087$). Finally, findings revealed that majority of the respondents 25(32.9%) were neutral that inventory audit had ensured that there is sufficient inventory turnover to avoid shortage, losses and wastage, 23(30.3%) agreed, 8(10.5%) disagreed and 4(5.3%) strongly disagreed ($M=3.5132$, $Std= 0.90143$).

In overall, inventory audit was practiced in the organization ($M=3.7184$, $Std= 0.71567$). According Lewis and Media (2014) concur that audit of inventory assisted in increasing efficiency and enables accuracy in inventory management. Audit of inventory assisted in reducing out date inventory and minimize losses which is similar to current study. Inventory control practice has assisted in enhancing efficiency and effectiveness in procurement according to Onchoke and Wanyoke (2016), which concurs with current study.

4.4.2 Inventory Management System

Inventory management system were analysed based on mean and standard deviation. The summary results of were based on a Likert scale of 1 as strongly disagree to 5 as strongly agree.

Table 4.6: Descriptive Statistics for Inventory Management System

INVENTORY MNGT SYSTEM STATEMENTS		SA	A	N	D	SD	Min	Max	M	Std. D
6. University adopted an inventory system that enable inventory to be coded for easy tracing.	%	15.8	73.7	10.5	0.0	0.0	1	5	3.9474	0.76411
	F	12	56	8	0	0				
7. Inventory tracking are done to trace items in the University	%	15.8	38.2	35.5	5.3	5.3	1	5	3.5395	0.99921
	F	12	29	27	4	4				
8. Cycles counting and verification is done to ensure all inventory are available.	%	14.5	39.5	35.5	10.5	0.0	1	5	3.5789	0.86815
	F	11	30	27	8	0				
9. Inventory replenishing are done based on the available information in records.	%	10.5	55.3	28.9	5.3	0.0	1	5	3.7105	0.72693
	F	8	42	22	4	0				
10. Inventory management system assist in budgeting for inventory in the Universities	%	15.8	31.6	47.4	5.3	0.0	1	5	3.5789	0.82078
	F	12	24	36	4	0				
Aggregate									3.6711	0.59751

Table 4.6 findings revealed a majority respondent of 56(73.7%) agreed that the University adopted an inventory system that enabled inventory to be coded for easy tracing, 12(15.8%) of the respondents strongly agreed and 8(10.5%) were neutral (M=3.9474, Std= 0.76411). Also majority of 29(38.2%) agreed that inventory tracking was done to trace items in the University, 27(35.5%) were neutral, 12(15.8%) strongly agreed while those who disagreed and strongly agreed had both 4(5.3%) respondents (M= 3.5395, Std= 0.99921). According to the results the majority of 30(39.5%) agreed that cycles counting and verification were done to ensure all inventory are available

while, 27(35.5%) were neutral, 11(14.5%) strongly agreed and 8(10.5%) disagreed ($M=3.5789$, $Std= 0.86815$). Also majority of the respondents 42(55.3%) agreed that inventory replenishing was done based on the available information in records, 22(28.9%) respondents were neutral, 8(10.5%) strongly agreed and 4(5.3%) disagreed ($M=3.7105$, $Std= 0.72693$). Lastly, majority of the respondents were 36(47.4%) neutral that inventory management system assisted slightly in budgeting for inventory in the Universities, 24(31.6%) of the respondents agreed, 12(15.8%) strongly agreed and 4(5.3%) disagreed ($M=3.5789$, $Std= 0.82078$). Inventory management was sufficiently adopted in University ($M=3.6711$, $Std= 0.59751$).

Musau (2015) found that inventory management assisted in maximizing inventory plan which increasing efficiency of supply chain. This ensured matching of right order with demand condition in inventory cycle which was found to concur with current study. In related study Kithae and Achuora (2017) found that there existed significant relationship between inventory cycles counting with performance of private commercial banks. The current study found that inventory cycle counting in ensuring inventory availability. This contributed to the performance of supply management. According to Musau *et al*, (2015) inventory management system assisted in overseeing transparent and smooth material flow in the supply management. This is similar to current study where inventory management assisted in tracking, replenishing and smooth flow of materials.

4.4.3 Inventory Security

Inventory security result were presented in mean and standard deviation. The summary results of inventory security were presented in Table 4.7.

Table 4.7: Descriptive Statistics for Inventory Security

INVENTORY SECURITY STATEMENTS		SA	A	N	D	SD	Min	Max	M	Std. D
11. There are sufficient records kept for inventory in the University to safeguard resource in the University.	%	40.8	39.5	9.2	5.3	5.3	1	5	4.0526	0.99416
	F	31	30	7	4	4				
12. Inventory inspection are often done to reduce loss of items in University	%	14.5	51.3	19.7	14.5	0.0	1	5	3.6579	0.90263
	F	11	39	15	11	0				
13. Stock taking is done to ensure the security of all inventory.	%	19.7	39.5	35.5	5.3	0.0	1	5	3.7368	0.83855
	F	15	30	27	4	0				
14. Inventory replenishing are done based on the available information in records.	%	19.7	51.3	23.7	5.3	0.0	1	5	3.8553	0.79505
	F	15	39	18	4	0				
15. There is sufficient security system which ensure security is not bridged in the University.	%	30.3	35.5	18.4	10.5	5.3	1	5	3.7500	0.95614
	F	23	27	14	8	4				
Aggregate									3.8105	0.76656

Table 4.7 provided the analysis of inventory security. The findings indicated majority 31(40.8%) strongly agreed that there were sufficient records kept for inventory in the University to safeguard resources in the University, 30(39.5%) agreed, 7(9.2%) neutral, 4(5.3%) disagreed and 4(5.3%) strongly disagreed (M=4.0526, Std=0.99416).

Inventory inspection were somewhat done often to reduce loss of items in University where majority of the respondents 39(51.3%) agreed, 15(19.7%) were neutral, 11(14.5%) strongly agreed and 11(14.5%) disagreed ($M=3.6579$, $Std = 0.90263$). Majority of the respondents 30(39.5%) agreed that stock taking was slightly done to ensure the security of all inventory while 27(35.5%) were neutral, 15(19.7%) strongly agreed and 4(5.3%) disagreed ($M=3.7368$, $Std= 0.83855$).

According to the findings the inventory replenishing was agreed by 39(51.3%) done based on the available information in records, however, 18(23.7%) were neutral, 15(19.7%) strongly agreed and 4(5.3%) disagreed ($M=3.8553$, $Std= 0.79505$). Majority of the respondents 27(35.5%) agreed that there was sufficient security system which ensure security was not bridged in the University. The results further reveals that 23(30.3%) strongly agreed, 14(18.4%) were neutral, 8(10.5%) disagreed and 4(5.3%) strongly disagreed ($M=3.7500$, $Std= 0.95614$). Stock security is sufficiently done in the University ($M=3.8105$, $Std= 0.76656$).

According to Lwaki *et al*, (2013) finding inventory control assisted in enhancing performance of organization. The organization was also able to enhance proper documentation of inventory security control in enhancing organization performance. Kabuthi and Amuhaya (2013) found that challenges of shortages were solved by improvement in security practices. It also found that stock marking activities, record keeping, alarm system and perimeter fencing contributed to increase in security inventory control. However, in the current study security was enhanced through records, inspection and sufficient security systems.

4.4.4 Supply Management

Supply management were analysed using mean and standard deviation based on Likert scale of 1 to 5 from strongly disagree to strongly agree. The results summarize was presented in Table 4.8.

Table 4.8: Descriptive Statistics for Supply Management

SUPPLY MNGT STATEMENTS		SA	A	N	D	SD	Min	Max	M	Std. D
16. There is sufficient inventory turnover which has improve supply management in the institution.	% F	10.5 8	50.0 38	25.0 19	14.5 11	0.0 0	1	5	3.5658	0.86926
17. Appropriate lead time are always given to avoid shortage of resource.	% F	30.3 23	28.9 22	21.1 16	19.7 15	0.0 0	1	5	3.6974	0.80779
18. The University has operated efficient and effective.	% F	9.2 7	50.0 38	15.8 12	19.7 15	5.3 0	1	5	3.3816	0.87042
19. There are adequate inventory in the University at all times	% F	9.2 7	35.5 27	28.9 22	21.1 16	5.3 4	1	5	3.2237	0.85323
20. Inventory has enable the University to manage resource and establish steady supply.	% F	25.0 19	34.2 26	26.3 20	9.2 7	5.3 4	1	5	3.6447	0.91599
Aggregate									3.5026	0.89293

Accordance to the results in Table 4.8, majority of the respondents 38(50.0%) agreed that inventory turnover improved supply management in the institution, while 19(25.0%) were neutral, 11(14.5%) disagreed and 8(10.5%) strongly agreed (M=3.5658, Std= 0.86926). Also, majority of the respondents 23(30.3%) strongly agreed that appropriate lead time was always given to avoid shortage of resource, where

22(28.9%) agreed, 16(21.1%) were neutral and 15(19.7%) disagreed ($M=3.6974$, $Std=0.80779$). Furthermore, majority of the respondents 38(50.0%) agreed that University had somewhat operated efficient and effective, however, 15(19.7%) strongly agreed, 12(15.8%) were neutral and 7(9.2%) strongly agreed ($M=3.3816$, $Std=0.87042$).

However, majority of the respondents 27(35.5%) strongly agreed that adequate inventory in the University at all times, 22(28.9%) were neutral, 16(21.1%) disagreed, 7(9.2%) strongly agreed and 4(5.3%) strongly disagreed ($M=3.2237$, $Std=0.85323$). Finally, findings indicated majority of respondent 26(34.2%) agreed that the inventory had somewhat enable the University to manage resource and establish steady supply, 20(26.3%) of the respondents were neutral, 19(25.0%) strongly agreed, 7(9.2%) disagreed and 4(5.3%) strongly disagreed ($M=3.6447$, $Std=0.91599$). The performance of supply management was somehow high in the University ($M=3.5026$, $Std=0.89293$).

4.5 Inferential Statistics

In order to investigate the relationship between inventory control practices and supply management in selected private and public institution inferential statistics was used. Correlation and regression analysis were used to establish the relationship between inventory audit, inventory management system, inventory security and supply management. Test of hypothesis was examined based on 5% significant level.

4.5.1 Correlation Analysis

Correlation analysis was examined to ascertain the interrelationship between variable at 5% significant level. The summary results were presented in Table 4.9.

Table 4.9: Correlation Analysis

		Inventory Audit	Inventory Management System	Inventory Security	Supply Management
Inventory Audit	Pearson Correlation	1	.661**	.711**	.839**
	Sig. (2-tailed)		.000	.000	.000
	N	76	76	76	76
Inventory Management System	Pearson Correlation		1	.785**	.610**
	Sig. (2-tailed)			.000	.000
	N		76	76	76
Inventory Security	Pearson Correlation			1	.749**
	Sig. (2-tailed)				.000
	N			76	76
Supply Management	Pearson Correlation				1
	Sig. (2-tailed)				
	N				76

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.9 results inventory audit did have a strong significant relationship with inventory management system as well as inventory security ($r=0.661$ and $r=0.711$ respectively, $p<0.05$). Similarly, inventory management system had strong significant relationship with inventory security ($r=0.785$, $P<0.05$). Inventory audit had a strong significant relationship with supply management ($r=0.839$, $p<0.05$). Inventory management system had moderate significant relationship with supply management ($r=0.610$, $p<0.05$). It was found that inventory security had strong significant relationship with supply management ($r=0.749$, $p<0.05$).

4.6 Test of Hypothesis

Test of hypothesis of inventory audit, inventory management and inventory security on supply management were analyzed. Correlation coefficient (r), coefficient of

determination (r square), f-ratio significance value and coefficient t-test significance value were used to test the H_{01} , H_{02} and H_{03} . These were presented as follows;

4.6.1 Test of Hypothesis for Inventory Audit and Supply Management

H₀₁: There is no significant relationship between inventory audit and supply management in selected public and private Universities in Nakuru County

The first objective examined the relationship between inventory audit and supply management. Simple linear regression model 1 was used given as;

$$Y = \beta_0 + \beta_1 X_1 + e \text{-----Model 1}$$

Y = Supply Management, β_0 = Constant Term, β_1 = Coefficients of Beta, X_1 = Inventory audit and e = Error Term. This was presented in table 4.10, 4.11 and 4.12.

Table 4.10: Model Summary for Inventory Audit and Supply Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.839 ^a	.703	.699	.48960	1.869
a. Predictors: (Constant), Inventory Audit					
b. Dependent Variable: Supply Management					

According to table 4.10 inventory audit had strong relationship with supply management ($R=0.839$). A variation of 70.3% was associated with inventory audit while other factors contributed 29.7%.

Table 4.12: ANOVA for Inventory Audit and Supply Management

Model		Sum of Squares	Df	Mean Square	F	P value
1	Regression	42.061	1	42.061	175.468	.000 ^b
	Residual	17.738	74	.240		
	Total	59.799	75			

a. Dependent Variable: Supply Management

b. Predictors: (Constant), Inventory Audit

Table 4.12 indicated that inventory audit had significant relationship with supply management ($F=175.468$, $P=0.000<0.05$). Inventory audit enable the University to improve supply management.

Table 4.13: Coefficients for Inventory Audit and Supply Management

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value
		B	Std. Error	Beta		
1	(Constant)	-.388	.299		-1.298	.198
	Inventory Audit	1.046	.079	.839	13.246	.000

a. Dependent Variable: Supply Management

The results in table 4.13 inventory audit had positive significant effect on supply management where a unit inventory audit had 1.046 units on supply management ($\beta_1 = 1.046$). According to the results there existed significant relationship between inventory audit and supply management in public and private University in Nakuru County ($r=0.839$, $p<0.05$).

First null hypothesis which examined if there is no significant relationship between inventory audit and supply management in selected public and private Universities in Nakuru County was rejected. Onchoke and Wanyoike (2016) also found that there

existed significant relationship between inventory audit practices and procurement performance. Even though the study was done in agro-chemical distributors within Nakuru Central. Similarly, Lewis and Media (2014) pointed that inventory audit assisted in improving efficiency in supply chain resulting to high performance in supply management. However, the study did not examine the significant relationship between inventory audit and supply management.

4.6.2 Test of Hypothesis for Inventory Management Systems and Supply Management

H₀₂: There is no significant relationship between inventory management system and supply management in selected public and private Universities in Nakuru County.

Inventory management systems was examined by supply management using simple linear regression. Simple linear regression model 2 was used.

$$Y = \beta_0 + \beta_2 X_2 + e \text{-----Model 2}$$

Y = Supply Management, β_0 = Constant Term, β_2 = Coefficients of Beta, X_2 = Inventory management system and e = Error Term. The results were indicated in table 4.14.

Table 4.14: Model Summary for Inventory Management Systems and Supply Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.610 ^a	.372	.364	.71238	2.421

a. Predictors: (Constant), Inventory Management System
b. Dependent Variable: Supply Management

Correlation coefficient revealed that inventory management system had moderate relationship with supply management ($R=0.610$). Inventory management system contributed 37.2% variation of supply management where 62.8% was due to other factors.

Table 4.15: ANOVA for Inventory Management Systems and Supply Management

Model		Sum of Squares	Df	Mean Square	F	P value
1	Regression	22.245	1	22.245	43.834	.000 ^b
	Residual	37.554	74	.507		
	Total	59.799	75			

a. Dependent Variable: Supply Management
b. Predictors: (Constant), Inventory Management System

Table 4.15 indicated that inventory management systems had significant relationship with supply management ($P=0.000<0.05$). Inventory management system provided to great extend to supply management.

Table 4.16: Coefficients for Inventory Management Systems and Supply Management

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value
		B	Std. Error	Beta		
1	(Constant)	.157	.512		.306	.761
	Inventory Management System	.911	.138	.610	6.621	.000

a. Dependent Variable: Supply Management

Table 4.16 indicated that a unit inventory management systems contributed 0.911 unit on supply management ($\beta_2=0.911$). The alternative hypothesis was adopted which implied that there was significant relationship between inventory management system and supply management in public and private University in Nakuru County ($r=0.610$,

p<0.05). Second null hypothesis that examined if there is no significant relationship between inventory management system and supply management in selected public and private Universities in Nakuru County was also rejected. Musau (2015) also found similar results where there existed a positive relationship between inventory management and procurement management. However, the inventory management was based on inventory maximization level plan on procurement management rather than supply management. In Kithae and Achuora (2017) inventory cycles counting was found to have positive significant on performance of commercial banks. However, the current study found that inventory management had significant influence on supply management. Ondieki *et al*, (2015) on the other hand found that inventory warehousing systems had positive significant influence on financial performance. On the contrary, the current study found relationship between inventory management system and supply management. Musau *et al*, (2017) also found that there existed significant relationship between inventory management and performance of textile firms in Kenya. However, the current study focused on supply management which had significant relationship with inventory management system.

4.6.3 Test of Hypothesis for Inventory Security and Supply Management

H₀₃: There is no significant relationship between inventory security and supply management in selected public and private Universities in Nakuru County.

The study also examined the relationship between inventory security on supply management. This was given as;

$$Y = \beta_0 + \beta_3 X_3 + e \text{-----Model 3}$$

Y = Supply Management, β_0 = Constant Term, β_3 = Coefficients of Beta, X_3 = Inventory security and e = Error Term. The results were presented in table 4.17, 4.18 and 4.19.

Table 4.17: Model Summary for Inventory Security and Supply Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.749 ^a	.561	.555	.59588	2.176
a. Predictors: (Constant), Inventory Security					
b. Dependent Variable: Supply Management					

Table 4.17 model summary revealed that inventory security had strong relationship with supply management ($R=0.749$). A variation of 56.1% in supply management is due to inventory security while other factor contributed 43.9%.

Table 4.18: ANOVA for Inventory Security and Supply Management

Model		Sum of Squares	Df	Mean Square	F	P value
1	Regression	33.524	1	33.524	94.416	.000 ^b
	Residual	26.275	74	.355		
	Total	59.799	75			
a. Dependent Variable: Supply Management						
b. Predictors: (Constant), Inventory Security						

ANOVA results in table 4.18 revealed that inventory security had significant relationship with supply management ($P=0.000<0.05$). Inventory security in the Universities has improved supply management.

Table 4.19: Coefficients for Inventory Security and Supply Management

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value
		B	Std. Error	Beta		
1	(Constant)	.179	.349		.514	.609
	Inventory Security	.872	.090	.749	9.717	.000

a. Dependent Variable: Supply Management

Table 4.19 showed that a unit inventory security had 0.872-unit effect on supply management. The results revealed that there existed a significant relationship between inventory security and supply management in selected public and private Universities in Nakuru County ($r=0.749$, $p<0.05$). The third hypothesis; there is no significant relationship between inventory security and supply management in selected public and private Universities in Nakuru County was also rejected. Similarly, Lwiki *et al.*, (2013) also found that proper documentation of inventory security control practice had positive significant influence on the performance of organization. However, in the current study inventory security had significant influence on the supply management rather performance of the organization. In another study by Kabuthi and Amuhaya (2013) found that inventory security contributed to reduction of challenge of shortages and enhance statistical relationship with safety performance. On contrary the current study found that inventory security had positive significant relationship with supply management performance.

4.6.4 Multiple Linear Regression Analysis of Inventory Control Practices and Supply Management

Regression summary model results were obtained to ascertain the correlation coefficient and coefficient of determination. This assisted in establishing the

relationship between inventory audit, inventory management system, inventory security and supply management.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \text{-----Model 4}$$

Where; Y = Supply Management, β_0 = Constant Term, β_1 , β_2 , β_3 = Coefficients of Beta, X_1 = Inventory audit, X_2 = Inventory management system, X_3 = Inventory security and e = Error Term. The summary multiple regression model was presented in Table 4.20.

Table 4.20: Summary Model for Inventory Control Practices and Supply Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.869 ^a	.755	.745	.45104	.755	73.982	3	72	.000	1.546

a. Predictors: (Constant), Inventory Security, Inventory Audit, Inventory Management System

b. Dependent Variable: Supply Management

Table 4.20 result explains that there existed a strong positive significant relationship between inventory control practices and supply management ($r=0.869$, $p<0.05$). Inventory audit, inventory management system and inventory security explained 75.5% of the variation of supply management (r Square = 0.755). However other factors contributed 24.5% of the variation of supply management.

Table 4.21: ANOVA for Inventory Control Practices and Supply Management

Model		Sum of Squares	Df	Mean Square	F	P value
1	Regression	45.152	3	15.051	73.982	.000 ^b
	Residual	14.647	72	.203		
	Total	59.799	75			

a. Dependent Variable: Supply Management

b. Predictors: (Constant), Inventory Security, Inventory Audit, Inventory Management System

Results in Table 4.21 indicated that the multiple regression model was fit to explain the relation between inventory control practices and supply management. This is because there existed significant linear relationship between inventory audit, inventory management system, inventory security and supply management ($F_{(3,72)} = 73.982$, $p < 0.05$).

The study examined regression coefficients for inventory audit, inventory management and inventory security respectively on supply management. The summary of regression coefficients was presented in Table 4.22.

Table 4.22: Coefficients for Inventory Control Practices and Supply Management

Model	Unstandardized		Standardized	T	P value	Collinearity	
	Coefficients		Coefficients			Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.544	.334		-1.629	.108		
1 Inventory Audit	.803	.107	.643	7.536	.000	.467	2.142
Inventory Management System	.172	.095	.115	1.811	.039	.362	2.764
Inventory Security	.444	.121	.382	3.686	.000	.318	3.149

a. Dependent Variable: Supply Management

According to Table 4.22 results the model was given as;

$$Y = 0.803X_1 + 0.172X_2 + 0.444X_3$$

Where; Y is Supply Management, X_1 is Inventory audit, X_2 is Inventory management system, X_3 is Inventory security. Which implied that a unit increase in inventory audit contributed 0.803-unit increase in supply management ($\beta = 0.803$). A unit increase of inventory management system lead to an increase of 0.172-unit in supply management

($\beta=0.172$). While a unit increase in inventory security would lead to 0.444-unit increase in supply management ($\beta=0.444$). Hence, inventory audit was the highest indicator of inventory control practice followed by inventory security and lastly inventory management system.

According to Onchoke and Wanyoike (2016) audit control had significant effect on procurement performance however, the current study indicated that inventory audit was significant on supply management. Procurement performance is one of the role of supply chain management which implies that it is important to consider inventory audit not only to improve performance of procurement but also enhance efficiency in supply management. The results also revealed that inventory audit plays major role in supply management as compared with inventory management system and inventory security.

Ondieki *et al.* (2015) found that inventory warehouse system had significant relationship with financial performance. However, the current research did inventory management system and found that it was significant on supply management. In this case inventory management system had the lowest effect on supply management. This implies that there is need to enhance existing inventory management system in the University in order to increase efficiency in supply management. Finally, inventory security has also a positive and significant effect on supply management which ensure that all inventory are safe and in the right condition. These results were summarized as follows;

Table 4.23: Summary of Test of Hypothesis

Hypothesis	Result	Remark
H ₀₁ : There is no significant relationship between inventory audit and supply management in selected public and private Universities in Nakuru County	r=0.839, p<0.05	Null hypothesis was rejected implying there existed significant relationship between inventory audit and supply management.
H ₀₂ : There is no significant relationship between inventory management systems and supply management in selected public and private Universities in Nakuru County	r=0.610, p<0.05	Null hypothesis was rejected implying there existed significant relationship between inventory management and supply management.
H ₀₃ : There is no significant relationship between inventory security and supply management in selected public and private Universities in Nakuru County	r=0.749, p<0.05	Null hypothesis was rejected implying there existed significant relationship between inventory security and supply management.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The section summarizes the existing result presented in chapter four which were used to develop conclusions and recommendations. It also assisted to find area for further research from the gaps obtained from both conclusion and recommendations.

5.2 Summary

The summary results inventory audit, inventory management system, inventory security and supply management were discussed. These were used to develop conclusion and recommendations. These were as follows;

5.2.1 Inventory Audit

Inventory audit was efficiently conducted in the Universities. This was done to ensure accuracy in records of inventory. Cost was also moderately controlled to reduce wastage and mismanagement of resources. Inventory audit was somewhat done periodically to enable the University property and resources are secured. Hence inventory audit had moderately ensured that there is sufficient inventory turnover to avoid shortage, losses and wastage. Further inferential analysis revealed that there was a positive relationship between inventory audit and supply management. Hence the null hypothesis was rejected and alternative adopted. However, inventory audit positive and significant relationship with inventory management system and inventory security. This implied that the inventory management system and inventory security did affect the

inventory audit done. Inventory audit was the most important inventory control practice that ensure efficient supply management.

5.2.2 Inventory Management System

According to the results the University adopted an inventory system that enable items to be coded for easy tracing. Inventory tracking is moderately done in the University to enable trace items. It was also found that cycles counting and verification were done to ensure all inventory were available. This enabled the Universities to replenish inventory based on available information in the records. It was also found that inventory management system moderately assisted in budgeting for inventory in the university. Inventory security and inventory audit also determined inventory management system. Inventory management system had significant relationship with supply management in public and private Universities in Nakuru County. However, it was the lowest inventory control practice that affect the supply management in the Universities.

5.2.3 Inventory Security

Inventory security was enhanced through sufficient records to safeguard resource in the University. It was also found that the University did regular inspections to reduce loss of items. Inventory security was also enhanced through stock taking so as to ensure security was sufficient for all the inventory. Since, inventory replenishing were done using the available records it ensured that all items could be traced within the institution. Hence the Universities had sufficient security systems which enable them to secure inventory. It was also found that there existed positive significant relationship between

inventory security and supply management. Hence, inventory security has improved University supply management to great extent.

5.2.4 Supply Management

Findings revealed that there was somewhat sufficient inventory turnover in the University which has improved supply management in the institutions. Supply management was also enhanced through use of appropriate lead time to avoid shortage of resources. However, the University supply management was moderately efficient and effective in operation which show need for further improvement. Similarly, the Universities had somewhat moderate inventory at all times. The supply management assisted the University to manage resources as well as establish steady supply of inventory.

5.3 Conclusions

1. The study concluded that there is a significant relationship between inventory audits on the supply management. The inventory audits were done efficiently to ensure accuracy of records. Cost was well controlled to ensure reduction of wastage and mismanagement of resource in the University. The inventory audit was somewhat done periodically and also ensure that there was sufficient inventory turnover to reduce shortage, losses and wastage.

2. Inventory audit ensures timely and adequate identification of inconsistencies and evaluation of inventories. In addition, inventory audit enables an organization evade

risks associated with inventory such as; inadequate and inappropriate inventory, unnecessarily high inventory levels, inaccurate and incomplete inventory records and obsolete inventory.

3. The study also concluded that there existed a significant relationship between inventory management system and supply management in the private and public Universities in Nakuru County. The inventory system available in the University allowed coding of inventory for ease of tracing. This assisted the Universities to track the inventory for ease tracing of item. The University also somewhat conducted cycles counting and verification to ensure all inventory were available while replenish based on the existing information in the records. Inventory management system was also used in budgeting for Universities' inventory. In addition, inventory management systems can be used to ease storage and retrieval of items, improved sales effectiveness and reduced operational cost.

4. The study concluded that inventory security had significant influence on supply management. This was enhanced through the use of record keeping, routine inventory inspection and stock taking. Inventory was also replenished based on the available information in the records. Hence the Universities were accorded sufficient security system which ensured that there was no loss or bridge of security. In addition, inventory security enhance efficiency and effectiveness in procurement activities.

5.4 Recommendations

From the findings and conclusions of the study, the following recommendations were made;

1. Periodic inventory audit ensures that the Universities have room for elimination of shortage, losses and wastage of resources. This can be improved by ensuring periodic inventory audit for all University property. Cost attached to negligence and mismanagement can also be transferred to the personnel and sufficient punishment should also be included to avoid loss through poor management of resources.

2. The inventory audit policies should be clear to ensure that all the personnel in charge of handling supplies, stores, records and security areas take care of the items. Institutions should have internal auditors to prove check and control the inventory activities especially on inventory records management.

3. Inventory security procedural practices should be developed in a participatory manner between the stores and procurement functions documented and should be well communicated across the institution. The records should be accurate in relation to the inventory in the institution.

4. The study also recommends that the inventory tracking system should be efficient for tracing all items existing in the University. In relation to inventory cycle counting, the organization should form strategic alliances with their suppliers so as to have a more improved working relationship characterized by a shared mind set and good financial

and funds flow. Inventory stock taking and verification should be done periodically for ease of tracing and locating items in the University.

5. Inventory management systems adopted in the Universities should be upgraded to allow ease of budgeting and replenishing in case of low stocks based on existing records. This can be enhanced through use of electronic inventory system that use coded method. In addition, inventory management system can be used to enhance information flow between the institutions and its suppliers and customers thereby enhancing customer service.

5.5 Suggestion for Further Research

From the research findings, conclusions and recommendations, the study suggests further research to be done to determine the influence of electronic inventory management system on supply management. Secondly, further research should be conducted to assess how inventory security procedural practices can be adopted by public and private institutions and whether such practices can be incorporated in the public procurement regulations. Thirdly, further research should be done to establish the integrated role of internal and external audit in inventory control especially in Universities. Lastly, the current study indicates that inventory management system is the lowest indicator for inventory control practices on supply management. However, there is growth in firms that have adopted electronic procurement system which ensure efficient in supply management. Therefore, there is a need to examine if the Universities utilized electronic inventory management system and its implication to the supply

management. This will give room for leveraging and adopting mechanisms that will enable improvements both in public and private institutions in the long run.

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APPENDICES

Appendix I: Questionnaire

The questionnaire is structured with intention of collecting data on the research study “Relationship between Inventory Control Practices and Supply Management in Selected Public and Private Universities in Nakuru County” information given shall be private and confidential and will only be used for academic purposes.

Kindly fill or tick where appropriate.

(Optional)

Title of the respondent.....

Name and the location of the institution.....

Section A: General Information

1. Gender:

Male [☐] Female [☐]

2. Age in years:

Below 18 [☐] 18 – 29 [☐] 30 – 39 [☐] 40 – 49 [☐] 50 and above [☐]

3. Level of education:

Tertiary certificate [☐] Diploma [☐] Undergraduate degree [☐] Masters [☐] PhD [☐]

4. What is your profession of training?

5. Duration the institution has been in operation:

Less than 10 years [☐] above 10 years [☐]

Section B: Inventory Control Practices

Part I: Inventory Audit

Please indicate using the scale how successful are the following inventory control practices in your institution. Scale: (5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree,

1 = Strongly Disagree (Tick as appropriate)

Qn	Inventory Audit	SA	A	N	D	SD
		5	4	3	2	1
8	University conduct inventory audit efficiently					
9	Inventory audit are done well to ensure accuracy in recording					
10	Cost are well controlled to ensure reduction of wastage and mismanagement of resource in the University.					
11	Inventory audit are done periodically to ensure all University property and resources are secured					
12	Inventory audit have ensured that there is sufficient inventory turnover to avoid shortage, losses and wastage.					

13. What are existing policies guiding inventory audit in the University?

Part II: Inventory Management System

Please indicate using the scale how successful are the following inventory control practices in your institution. Scale: (5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree,

1 = Strongly Disagree (Tick as appropriate)

Qn	Inventory Management System	SA	A	N	D	SD
		5	4	3	2	1
14	University adopted an inventory system that enable inventory to be coded for easy tracing.					
15	Inventory tracking are done to trace items in the University					
16	Cycles counting and verification is done to ensure all inventory are available.					
17	Inventory replenishing are done based on the available information in records.					
18	Inventory management system assist in budgeting for inventory in the universities					

19. What type of inventory system are in the University?

Part II: Inventory Security

Please indicate using the scale how successful are the following inventory control practices in your institution. Scale: (5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree,

1 = Strongly Disagree (Tick as appropriate)

Qn	Inventory Security	SA	A	N	D	SD
		5	4	3	2	1
20	There are sufficient records kept for inventory in the University to safeguard resource in the University.					
21	Inventory inspection are often done to reduce loss of items in University					
22	Stock taking is done to ensure the security of all inventory.					
23	Inventory replenishing are done based on the available information in records.					
24	There is sufficient security system which ensure security is not bridged in the University.					

25. What are the security policies that are available to ensure inventory security in the University?

Section C: Supply Management

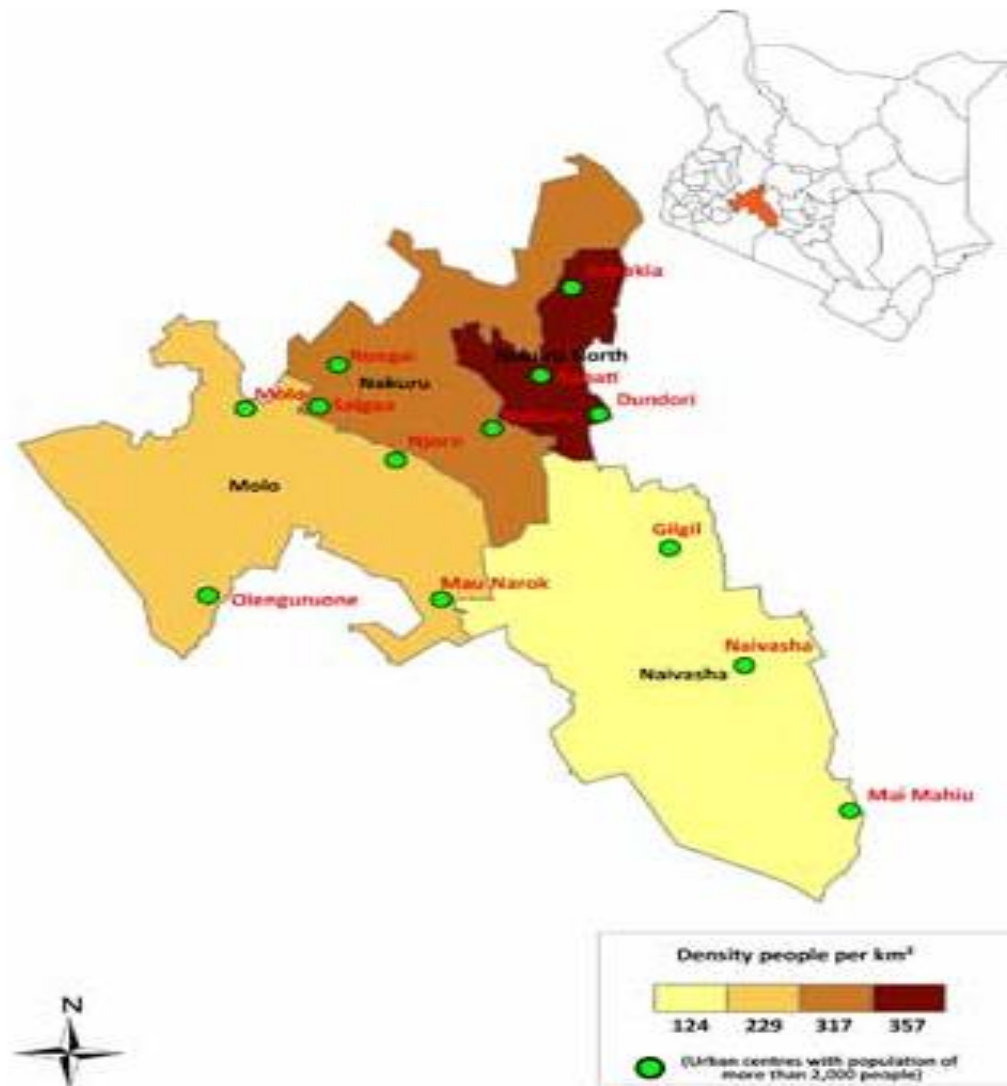
Please indicate using the scale which of the following supply management are successful in the institution. Scale: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree (Tick as appropriate)

Qn	Supply Management	SA	A	N	D	SD
		5	4	3	2	1
27	There is sufficient inventory turnover which has improve supply management in the institution.					
28	Appropriate lead time are always given to avoid shortage of resource.					
29	The University has operated efficient and effective.					
30	There are adequate inventory in the University at all times					
31	Inventory has enable the University to manage resource and establish steady supply.					

32. What are other supply management practices which are done in the University?

Thank you for your participation

Appendix II: Nakuru Map



Appendix III: NACOSTI Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 873643	Date of Issue: 28/July/2021
RESEARCH LICENSE	
	
This is to Certify that Miss. Billa Rotich Soro of University of Kabianga, has been licensed to conduct research in Nakuru on the topic: RELATIONSHIP BETWEEN INVENTORY CONTROL PRACTICES AND SUPPLY MANAGEMENT IN PUBLIC AND PRIVATE UNIVERSITIES IN NAKURU COUNTY for the period ending: 28/July/2022.	
License No: NACOSTI/P21/12061	
Applicant Identification Number: 873643	 Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
Verification QR Code 	
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	

Appendix IV: Permit From County Commissioner



**OFFICE OF THE PRESIDENT
Ministry of Interior and Coordination of
National Government**

Email: cnakurucounty@yahoo.com
cnakurucounty@gmail.com

COUNTY COMMISSIONER
NAKURU COUNTY
P.O. BOX 81
NAKURU

When replying please quote:

Ref No. CC. SR. EDU 12/1/2/VOL.VI/31 2nd August, 2021

Deputy County Commissioner

- Njoro Sub County
- Rongai Sub County

RE: RESEARCH AUTHORIZATION – BILHA ROTICH SARO

The above named from University of Kabanga has been authorized to carry out research on **Relationship Between Inventory Control Practices and Supply Management in Public and Private Universities** in Njoro and Rongai Sub Counties in Nakuru County for a period ending 28th July, 2022.

Please accord her all the necessary support to facilitate the success of her research.


**AUSTINE DIATO
FOR: COUNTY COMMISSIONER
NAKURU COUNTY**

Appendix V: Nakuru County Government



Telephone: Nakuru 2214142

When replying please quote

E-Mail: nakurucounty.governor@gmail.com

**REPUBLIC OF KENYA
OFFICE OF THE GOVERNOR
NAKURU COUNTY**



OFFICE OF THE GOVERNOR
NAKURU COUNTY
P.O. BOX 2870 - 20100
NAKURU

REF: NCG/S/GEN/VOL.IV/62

3rd August, 2021

TO WHOM IT MAY CONCERN

**RE: AUTHORITY TO CONDUCT RESEARCH
MISS BILHA ROTICH SARO**

The above named person has been authorized to conduct a research study in Egerton and Kabarak Universities in Nakuru County; **Topic: Relationship between Inventory Control Practices and supply Management in Public and Private Universities** in Nakuru County for the period ending 28th July, 2022.

License No: **NACOSTI/P/21/12061.**

Please accord her the necessary support.

**GICHUHI NJOROGE
FOR: COUNTY SECRETARY AND HEAD OF PUBLIC SERVICE
NAKURU COUNTY**

Appendix VI: Ministry of Education Permit

MINISTRY OF EDUCATION
STATE DEPARTMENT OF EARLY LEARNING OF BASIC EDUCATION

Telegrams: "EDUCATION", Telephone: 051-2216917 When replying please quote Email: cdenakurucounty@gmail.com		COUNTY DIRECTOR OF EDUCATION NAKURU COUNTY P. O. BOX 259, NAKURU,
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Ref. CDE/NKU/GEN/4/1/21 VOL.II/18

2nd August, 2021

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION – BILHA ROTICH SARO
PERMIT NO. NACOSTI/P/21/12061

Reference is made to letter NACOSTI/ P/21//12061 dated 28th July, 2021

Authority is hereby granted to the above named to carry out research in Nakuru County, Kenya on the topic: ***"RELATIONSHIP BETWEEN INVENTORY CONTROL PRACTICE AND SUPPLY MANAGEMENT IN PUBLIC AND PRIVATE UNIVERSITIES"*** for the period ending ***28/07/2022***.

Kindly accord her the necessary assistance.


Ruth Kamau
For: COUNTY DIRECTOR OF EDUCATION
NAKURU



Copy to:

- University of Kabianga