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**RELATIONSHIP BETWEEN INVENTORY MANAGEMENT POLICIES
AND SUPPLY CHAIN PERFORMANCE OF RETAIL SUPERMARKETS
IN NAIROBI CITY COUNTY IN KENYA.**

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RELATIONSHIP BETWEEN INVENTORY MANAGEMENT POLICIES AND SUPPLY CHAIN PERFORMANCE OF RETAIL SUPERMARKETS IN NAIROBI CITY COUNTY IN KENYA.

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Abstract

Purpose: To explore the relationship between inventory management policies and supply chain performance of supermarkets in Nairobi City County in Kenya. The study specifically sought to examine the relationship between inventory control policies, risk management policies, information technology policies, and stakeholder management policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya. The study's theoretical review was based on the Balanced Score Card, Contingency theory, Resource Based View and Stakeholder theory.

Methodology: Descriptive research design which employed both qualitative and quantitative approaches was used to investigate the relationship between inventory management policies and supply chain performance. The target population was 112 supermarkets in Nairobi City County as listed in the 2016 master file of the Nairobi City County licensing department. Stratified random sampling was used to determine the study sample of 88 using Slovin's sample size formula. Primary data was collected through questionnaires that were administered to supermarkets' supply chain managers by drop and pick technique. Statistical Package for Social Scientists (SPSS) version 21 was used to code, enter, process and analyze data into descriptive and inferential statistics.

Results: The study's response rate was 84.1%. Pearson correlation Coefficient (r) and multiple regression models were used to determine the relationship between the study variables. ANOVA was also used to test the significance level of the independent variables on the dependent variable at 95% confidence level. The regression model study results had an adjusted R^2 value of 0.672 which showed that the independent variables in the study were able to explain 67.2% variation in supply chain performance with the remaining 32.8 % being explained by other variables outside the model. The study findings established that a positive significant relationship exists between inventory management policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya.

Contribution to policy and practice: The study recommended that supermarkets supply chain managers to periodically assess their inventory management policies to ensure that they were effective and adequate in controlling inventory levels and the associated inventory risks while

regulating the use of information technology and supporting stakeholder management policies that encourage good relations, timely payment to suppliers, employee efficiency and customer loyalty.

Key Words: Inventory Control Policies, Risk Management Policies, Information Technology Policies, Stakeholder Management Policies and Supply Chain Performance.

1.0 INTRODUCTION

Supermarkets are categorized under the retail trade sector in Kenya and play an important role of creating employment opportunities as well as a convenient trading platform that bridges the gap between producers and consumers of goods thereby contributing to the overall economic growth of the country (GOK, 2012). According to Bond (2013), the term retail means to cut a piece off or to break bulk while retailing is a process or system by which large quantities of goods or services are broken down and repackaged into a quantity or form that is readily usable by the end consumer. In Kenya, retail trade is defined as the re-sale (sale without transformation) of goods to the general public, for personal or household consumption or utilization (GOK, 2012). The inventory management policies adopted by supermarkets play an important role in shaping inventory decisions because a retail supermarket's ability to sell depends on the available planned assortment of goods on the shelves for consumers to buy and as Muller (2011) posits, effective inventory management policies that are able to guide the firm on how much and when to order, how much inventories to hold so as to minimize costs and how to achieve a balance of current demand patterns with future needs so as to win the confidence of customers are crucial in maintaining a healthy supply chain performance.

According to Michalski (2013), retailers should pay attention to their inventory management policies because holding too much inventories escalates storage, insurance, wastage, obsolescence, spoilage and transport costs while maintaining low inventories could lead to problems in meeting demand. Therefore, appropriate supermarket inventory management policies will help to minimize the costs associated with inventory while achieving the desired customer satisfaction levels and overall business success because such policies guide decisions on the length of replenishment cycles of stores, the shelf-capacity to be allocated to each item, the amount of inventory stored in the backroom of the store and the minimum order quantity of each item in store (Trauzette, 2014). In retail businesses worldwide, systems to measure and manage supply chain performance are becoming fundamental in supply chain management which creates value for companies, customers and stakeholders interacting throughout a supply chain (Siham, Jean, Laurent, Yves & Zied, 2015). Consequently, cost conscious firms are realizing that inventory could turn into an unproductive asset because the money tied up in inventory could well be put in productive use elsewhere thus prompting supply chain managers to carefully evaluate and redesign their inventory management policies so as to encourage positive supply chain performance (Samson & Daft, 2012). In today's competitive retail industry, a firm's supply chain has been recognized as a key factor of success because it is the best means by which it is able to achieve important goals (Estampe, Lamouri, Paris & Brahim, 2013). Therefore, supply chain managers should ensure that the inventory management policies adopted by their firms are properly evaluated and monitored to encourage good net working capital practices that reduce the level of cash tied up in inventories and receivables (Michalski, 2013). It is also important to note that, although inventory management policies have significant

implication on a firm's overall performance, how well they are adopted and executed is determined by the level of management commitment, costs incurred and the level of skills that the workers have (Mahyadin, Saad, Asaad, & Yusoff, 2015).

1.1 Statement of the problem

One of the major problems facing retail supermarkets in Kenya is weak inventory management policies which do not adequately address inventory management issues thus creating loopholes and inefficiencies which eventually leads to losses, constrained cash flows and poor stakeholder relationships all of which ultimately affects supply chain performance (Otieno, Nyang'au, & Mbura, 2018). According to RETRAK (2018), local Kenyan supermarket chains struggle to stay in the market because their inventory management policies fail to adequately address inventory controls, inventory risks, data and information sharing, technology use and stakeholder interests thus constraining their ability to generate enough cash flows to meet their financial obligations on time. The laxity in adhering to inventory management policies regarding payment to suppliers in Kenyan supermarkets for instance was found to have an adverse effect to their supply chain performance and as a research by MoITC (2017) found, supermarkets owed 92% of the KES 40bn Kenya's retail sector's estimated outstanding debts to their suppliers for delivered goods while prolonging late overdue payment days from 60 days to between 180 and 240 days. Further, the huge debt and prolonged overdue payments created additional problems because it threatened future business engagements with suppliers whose financial ability to continue supplying the supermarkets with future goods became limited resulting in strained relations and stock-outs (MoITC, 2017).

Weak inventory management policies have also encouraged inventory shrinkage in Kenyan supermarkets and as Ciuri & Juma (2015) contends, Kenyan supermarkets lose goods worth approximately Sh3.5 billion annually due to poor internal control policies that hide operational problems allowing risks of theft to materialize through the collusion of suppliers, supermarket employees and shoppers. Further, according to the National Retail Security Survey (2016), inventory shrinkage amounting to 1.38 % of retail sales is attributed to weak inventory management policies which are not able to identify and prevent losses and inefficiencies across supply chains. The GOK, in its vision 2030 planned to raise the share of products sold through formal retail supermarkets by establishing at least three new retailers with more than 10 stores each so as to grow the retail sector by at least 5% per annum from 2007 (GOK, 2012). However, due to weak inventory management policies, the sectors performance experienced an unprecedented decline over the same period declining from 11.3% in 2007 to 3.8% in 2016 (MoITC, 2017). It was against this background information therefore, that this study forged forth so as investigate the possible relationship between inventory management policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya.

1.2 Research objectives

- i. To examine the relationship between inventory control policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya.
- ii. To determine the relationship between risk management policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya.

- iii. To find out the relationship between information technology policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya.
- iv. To establish the relationship between stakeholder management policies and supply chain performance of retail supermarkets in Nairobi City County in Kenya.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Balanced Score Card (BSC)

The Balanced Score Card which was proposed by Kaplan and Norton in 1992 is built on the premise that the best performance measures are those linked to a business' strategy (Kaplan & Norton, 1992). In this study, the Balanced Score Card theory was linked to the inventory control policies variable. According to Chia, Goh & Hum (2009), firms need to recognize the importance of key drivers of strategic future performance when setting and coordinating policies so as to ensure that a competitive balanced perspective is achieved when measuring performance because it is important for management to ensure that the inventory control policies adopted by their organizations are able to translate their vision and strategy into action. The BSC is an important tool through which managers are able to translate their organization's strategy into a comprehensive set of inventory control policies and measures that are capable of assessing and managing performance based on financial, customer, internal business processes as well as learning and growth perspectives because it captures all organization's activities ranging from operational processes, employees work competencies and attitudes, shareholder concerns, financial performance as well as customer issues (Simani, 2017). The inventory management policies adopted by an organization are a major source of competitive advantage because companies that continuously improve their policies, practices and capabilities have been found to achieve better performance in their internal business processes leading to satisfied customers as well as improved financial performance and as Bhagwat & Sharma (2007) argue, the way orders are generated and scheduled determines the performance of the downstream activities, inventory levels and the overall supply chain performance. Therefore, it is important for supply chain managers to design inventory control policies that will minimize total inventory costs while encouraging positive supply chain performance. Due to the complex and dynamic nature of retail supply chains, coupled with demanding customer service requirements and perceptions, a careful evaluation of costs associated with inventories such as ordering costs, holding costs and stock-out costs is needful and as Bower & Hout, (1988) posits, inventory control policies which for instance reduces order cycle times directly influences customer satisfaction levels as a result of reduced supply chain response time thus, the inventory control policies and techniques adopted by a firm are able to guide retailers on how to meet their learning and growth, internal business processes, customer and financial objectives.

2.1.2 Contingency Theory

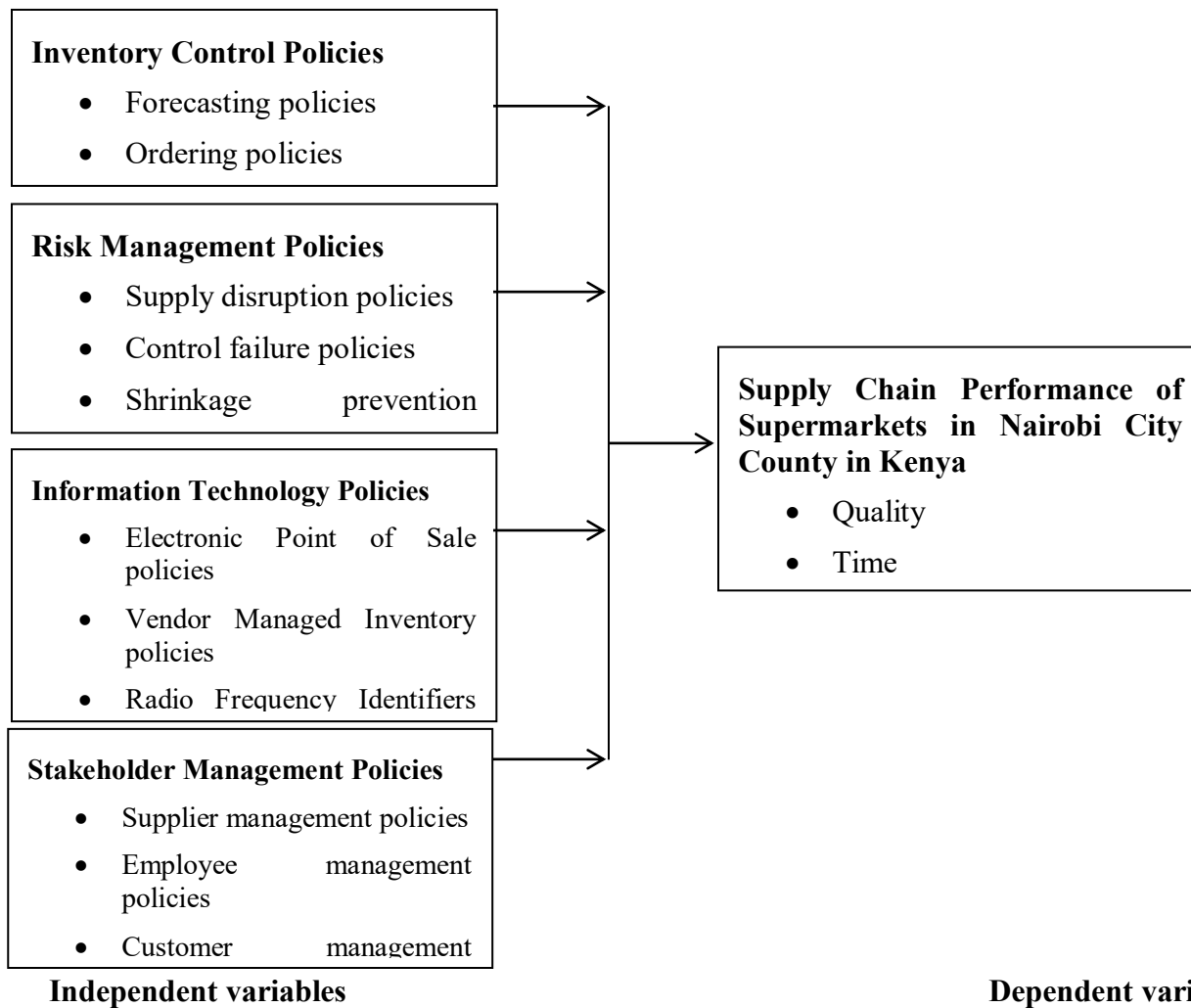
Contingency theory was founded by Fred Edward Fiedler in 1964 and is of the opinion that there is no single best way to manage organizational processes thus, managers should think about the consequences of a decision in relation to the company as a whole under different scenarios or situations so as to minimize the occurrence of risks (Fiedler 1964). Situational leadership approaches agrees with contingency theory by stating that organizations face different tasks

which must be handled differently and managers need to appropriately adapt to situations or tasks and align them to fit the goals or objectives to be accomplished because the most effective organizational structural design is one where the structure fits the contingencies (Hersey, Blanchard & Johnson, 2007). In this study, contingency theory was linked to the risk management policies variable to show that the risk management policies adopted by managers play a crucial role in handling supply disruptions due to extended lead times, cost escalations, supplier insolvencies, technology failure, damages and loss of inventories in an organization (Kiarie, Ngugi & Ogollah, 2017). According to Wagner & Bode (2008), firms should consider the context in which the risk strategy is crafted and implemented because organizational efficiency and performance arises where risk policies are able to respond to inventory problems at hand while paying attention to the overall supply chain performance. According to Child (1972), if a strategic fit is not achieved in managing supply chain risks, opportunities are lost, costs rise and the continuity of the organization is threatened. Therefore, supply chain managers should analyze all the key risk factors and their effects on supply chain performance so as to develop risk policies and contingency plans that are capable of preventing or quickly responding to supply chain risks that may materialize because proactive supply chain risk management is crucial in countering supply chain disruptions (Grötsch, Blome & Schleper 2013).

2.1.3 Resource Based View (RBV)

The Resource Based View was proposed by Birger Wernerfelt in 1984 (Wernerfelt, 1984). The theory is grounded on the premise that a firm performance is determined by its resources and in order to understand business strategy as anchored in the distinctive internal abilities of the firm and its strategy formulation process, a firm has to focus on its resources and capabilities so as to create and sustain competitive advantage (Wernerfelt, 1984.) In this study the resource based view was linked to the information technology policies variable to show that information technology which is owned or controlled by an organization is a valuable resource capable of creating and maintaining a competitive advantage (Barney, 1991). According to Liang & You (2009), information technology is considered as an organizational resource and therefore appropriate information technology management policies can enhance organizational capabilities and eventually lead to a higher and superior long-term performance. The RBV theory attempts to identify how a firm performance and its sustainability depends upon the uniqueness, rareness, and non-imitability of its resources and points out that a firm is likely to be less effective where its current actions are incongruent with its resources but more effective than other firms in the same industry when there is a strategic fit between its current investments and its accumulated resources and capabilities (Naliaka & Namusonge, 2015). Information technology management policies do not only direct how tangible assets such as information systems hardware, network infrastructure and intangible assets such as software and patents are managed, but they also determine how capabilities such as technical knowhow, information sharing, managerial ability, system integration and process improvement are combined to manage inventory and create the organization's competitive advantage in the market (Wade & Hulland 2004).

2. 2 Conceptual framework



2.3 Inventory Control Policies

Defining and instituting appropriate inventory control policies is the most crucial aspect of inventory management strategy in an organization because inventory is one of the key drivers of supply chain performance and therefore, for firms to maximize profits, they need to have policies in place that ensures that operations are managed efficiently and comprehensively because from the retail operations perspective, inventory policies that control how, when and how much inventories to order, stock up and sell determines the ultimate cash, profits and overall business performance (Katehakis, Melamed, & Shi, 2016). According to Mehdi (2014), as supermarket retailers strive to provide great choices for consumers by introducing new brands, more flavors and different sizes of existing products or new products with varied attributes, additional managerial challenges arise in terms of setting inventory control policies that will maximize total profit. According to Diabat & Theodorou (2015), appropriate inventory control policies in an organization helps to plan for and manage inventories in such a way that insufficient stock

which limits sales or excessive inventories which tie up money in the business is eliminated. Inventory control policies involving forecasting, ordering and monitoring of inventory are generally guided by demand, supply and operational aspects of an organization and mainly focus on issues such as how to order, when to order, how much to order, who is to order, when to conduct inventory reviews, and how to keep the inventory records (Singh, 2016). Therefore, it is important for supply chain managers to have accurate information and knowledge of the underlying demand distribution from their inventory records in order to derive, design and institute appropriate inventory control policies for their organizations (Bai, Alexopoulos, Ferguson, & Tsui, 2012). A good inventory control policy is one which ensures that inventories are held at a point where replenishment can act within effective tolerances and not react to wild swings of purchasing (Davis, 2013). According to Diabat & Theodorou (2015), inventory policy practices have a direct impact on inventory costs because inadequate policies creates loose work environments that can allow employees to steal inventory items. Managers should therefore ensure that all their employees adhere to the set inventory policies and procedures so as to reduce inventory costs associated with pilferage, shrinkage and excess inventory as well as avoid storage of either insufficient or excessive inventories, all of which result in financial loss to a firm (Ngugi, Aiyabei, Maroko, & Ngugi, 2012).

2.4 Risk Management Policies

Risk is the variation in the distribution of possible outcomes, their likelihoods, and their subjective values leading to unpredictable performance which is considered to continue to increase when targets are missed as a result of large variations in expected values or outcomes (Chen, Sohal, & Prajogo, 2013). According to Chiu & Choi (2016), if there are some sources of uncertainty such as demand uncertainty and supply uncertainty, the supply chain performance of a firm also gets affected by becoming uncertain. It is therefore important for firms to institute comprehensive inventory risk management policies which consider internal risks related to their business processes as well as external risks associated with demand and supply chain network arising from the external environment so as to put proper control mechanisms to eliminate or reduce internal risks that appear in normal operations such as late deliveries, excess stock, poor forecasts, human errors, and faults in IT systems and external risks such price inflation, problems with stakeholders and material shortages ((Richard, 2016; Baghalian, Rezapour, & Farahani, 2013). Product obsolescence, product value and uncertainty of products demand and supply are some of the factors that give rise to inventory risks and although the easiest method of reducing supply chain risks is to have more buffer stock, the strategy is certainly not the least expensive since it may lead to inventory devaluation or obsolescence as well as higher holding costs (Lu, Jain, & Zhang, 2012).

Therefore, when designing inventory risk policies, supply chain managers should investigate the level of risk associated with inventory decisions as regards demand uncertainty by estimating the expected under-stocking risk and the expected over-stocking risk (Chiu & Choi, 2016).

2.5 Information Technology Policies

Information technology policies guide the use of hardware, software and telecommunications network that facilitates the acquisition, collection, processing, storing, delivery, dissemination, sharing and presentation of information and other digital content by people in an organization (Peppard & Ward, 2016). Therefore, supply chain managers are advised to institute and

constantly evaluate the adequacy of their information technology management policies in safeguarding their inventory management information systems so as to improve their overall business value maximization (Hoberg & Herdmann, 2018). According to Stafford (2015), information technology has revolutionized retail trade by providing a basis through which store-based retailers are able to meet increasing customer demands for lower prices, custom product configurations and immediate product availability. Consequently, the strategic use of ICT tools and facilities enables firms to not only do easy stock tracking, but also quickly identify outdated stock while reducing clerical errors which may lead to overstocking or under-stocking thus reducing holding cost and improving customer service delivery (Adzimah & Awuah, 2015). As information and communication technology continues to connect and coordinate various supply chain activities, its use has spread rapidly in inventory management throughout the last few decades with companies seeking to improve efficiency through increased integration among suppliers and buyers (Mongare & Nasidai, 2014). Therefore, information technology has become an important strategic tool for planning and deployment of resources as well as a vital and integral supply chain component that drives competitive advantage through enhanced efficiency and cost reductions (Jadhav, 2012).

2.6 Stakeholder Management Policies

Stakeholders have a variety of expectations and informational needs concerning a firm's supply chain which form a basis of stakeholder accountability and control. According to Ombati (2018), control is the ability for a firm to influence decisions that have an effect on the stakeholders while accountability is the degree to which an organization is held responsible by stakeholders for certain decisions or actions and therefore, to manage their firms successfully, managers should take into consideration the needs of their various stakeholders. To align stakeholder expectations with company goals while leveraging their accountability with their interests in the dimensions of inclusivity, scope and disclosure, firms are proactively developing a wide variety of monitoring systems which characterize supply chain processes to identify key measures, collect and process data, verify accuracy, materiality and reliability of any data and resulting information so as to know the role played by different stakeholders and their impact on supply chain performance. (Gualandris, Klassen, Vachon, & Kalchschmidt, 2015). According to Harrison, Freeman & Cavalcanti (2015), effective stakeholder management policies harnesses the energy of stakeholders towards the fulfillment of the organization's goals because organizations that manage stakeholders have better information upon which to base their decisions, are more attractive to other market participants and have a degree of strategic flexibility that is not available to competitors that do not manage for stakeholders because stakeholders who are treated well tend to reciprocate with positive attitudes and behaviors towards the organization.

2.7 Supply Chain Performance

A supply chain embodies all such activities that influence timing, cost, quality and delivery of a product (Khare, Saxsena, & Teewari, 2012). Therefore, the main objective of measuring supply chain performance is to assess whether customer satisfaction and supply chain profitability is being achieved by improving the competitiveness, effectiveness and flexibility of an organization for the benefit of all stakeholders which requires a firm to adopt a total quality management approach to supply chain management through assessment of key quality performance indicators

(KPIs) such as lead time, flexibility and speed (Chandra, 2013). A performance measure is a quantification that provides objective evidence of the degree to which a performance result is occurring over time (Barr, 2012). Although traditional supply chain were simple with performance measures mainly focusing on internal, historical data and financial indicators, the 21st century business firms have to continuously measure, track and manage the performance of their supply chain processes environment so as to devise and implement strategies that are able to counter challenges of uncertainty, growing competition, more demanding customers and pressure to cut costs (Stefanovic, 2014). Although supply chain cost reduction is important in reducing the cost of sales and increasing profit, cost reduction strategies can no longer be solely relied upon in modern day supply chains which are increasingly being considered as competitive differentiators for enterprises and as a result, other key performance metrics such as inventory turns, time and quality need to be incorporated for a comprehensive supply chain performance measurement (Intrieri, 2016).

3.0 RESEARCH METHODOLOGY

The study adopted a descriptive research design and targeted 112 supermarkets in Nairobi City County as at January 2017 (Nairobi City County, 2016). Stratified random sampling was used to determine the study sample of 88 using Slovin's sample size formula. The unit of analysis was retail supermarkets in Nairobi City County and the unit of observation was the supermarkets' supply chain managers. Primary data was collected through questionnaires that were administered to supermarkets' supply chain managers by drop and pick technique. Inferential and descriptive statistics was used to analyse data. Results of the analysis were presented by use of tables and figures. Inferential statistics was used to establish the association between independent variables and dependent variable. The study used the following regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where Y = Supply chain performance, X_1 = Inventory control policies, X_2 = Risk management policies, X_3 = Information technology policies, X_4 = Stakeholder management policies, β_0 = Constant of regression which is the value of the dependent variable when the independent variable is 0, $\beta_1 \dots \beta_4$ = Regression coefficients for each independent variable and ϵ = Error term of prediction.

4.0 RESULTS

4.1 Response rate

The study administered 88 questionnaires where 74 questionnaires were filled and returned. This represented a response rate of 81.4%. According to Mugenda & Mugenda (2012), a response rate of 70% and above is considered acceptable for research purposes and therefore, the response rate of 84.1% was considered adequate because it was within the acceptable threshold that could be depended upon to make the study's analysis, conclusion and recommendations.

4.2 Descriptive statistics

Mean and Standard Deviation on use of Inventory Control Policies

The study sought to establish the extent to which inventory control policies were used in their supermarkets. The respondents were asked to indicate on a 5 point likert scale, the extent to which forecasting policies, ordering policies and monitoring policies were used to manage inventory in their organizations. The results show a mean of 3.07 for forecasting policies, 3.64 for ordering policies and 3.77 for monitoring policies. According to the results, the mean of 3.07, 3.64 and 3.77 signified that the respondents agreed that forecasting, ordering and monitoring policies were used in their supermarkets. Further, a standard deviation of 0.709, 0.945 and 0.869 showed that the respondents did not differ significantly in their views. Therefore, it can be concluded that, supermarkets in Nairobi use inventory control policies. Table 1 presents the mean and standard deviation results for inventory control policies.

Table 4.1: Mean and Standard Deviation on use of Inventory Control Policies

Inventory Control Policies	N	Mean	Std. Dev	Variance
Indicate the extent to which forecasting policy is used in your supermarket.	74	3.07	.709	.502
Indicate the extent to which ordering policy is used in your supermarket.	74	3.64	.945	.892
Indicate the extent to which monitoring policy is used in your supermarket.	74	3.77	.869	.755

Mean and Standard Deviation on use of Risk Management Policies

The study sought to establish the extent to which risk management policies were used in supermarkets. Based on a 5 point likert scale, the respondents were asked to indicate the extent to which, supply disruption policies, control failure policies and inventory shrinkage policies were used to manage inventory in their organizations. The results revealed a mean of 3.04 and SD. of 1.116 for supply disruption policies, 3.51 and SD. of 1.208 for control failure policies and 3.55 and SD of 1.022 for inventory shrinkage policies. According to the mean score results, the respondents agreed that risk management policies were used in their supermarkets although the sentiments were very much contested as shown by a standard deviation of above 1.0. Table 2 presents the mean and standard deviation results for risk management policies.

Table 4.2: Mean and Standard Deviation on use of Risk Management Policies

Risk Management Policies	N	Mean	Std. Dev	Variance
Indicate the extent to which supply disruption policy is used in your supermarket.	74	3.04	1.116	1.245
Indicate the extent to which control failure policy is used in your supermarket.	74	3.51	1.208	1.459
Indicate the extent to which inventory shrinkage policy is used in your supermarket.	74	3.55	1.022	1.045

Mean and Standard Deviation on use of Information Technology Policies

The study sought to establish the extent to which information technology policies were used in supermarkets by asking respondents to indicate, based on a 5 point likert scale, the extent to which electronic point of sale, vendor managed inventory and radio frequency identification

policies were used to manage their organizations inventory. According to the results, electronic point of sale had mean score of 3.58 and SD. of 1.216, vendor managed inventory had a mean score of 3.47 and SD. of 1.023 and radio frequency identification had a mean of 3.318 SD of 1.254. Although the mean score results show that respondents agreed that information technology policies were used in their supermarkets, the sentiments were very much contested as shown by a standard deviation of above 1.0. However, from the results, it can therefore be concluded that most supermarkets in Nairobi use information technology policies to regulate and manage inventory across their supply chains. Table 3 presents the mean and standard deviation results for information technology policies.

Table 4.3: Mean and Standard Deviation on use of Information Technology Policies

Information technology policies	N	Mean	Std. Dev	Variance
Indicate the extent to which Electronic Point of Sale policy is used in your supermarket.	74	3.58	1.216	1.480
Indicate the extent to which Vendor Managed Inventory policy is used in your supermarket	74	3.47	1.023	1.047
Indicate the extent to which Radio Frequency Identification policy is used in your supermarket	74	3.18	1.254	1.571

Mean and Standard Deviation on use of Stakeholder Management Policies

The study sought to establish the extent to which stakeholder management policies were used in supermarkets by asking respondents to indicate on a 5 point likert scale, the extent to which supplier management policies, customer management policies and employee management policies were used to manage inventory in their organizations. The results show a mean of 3.50 and SD. of 1.063 for supplier management policies, 3.77 and SD. of 0.987 for employee management policies and 3.95 and SD of 1.058 for customer management policies.

From the mean score results, it was concluded that majority of the respondents agreed that stakeholder management policies were used in their supermarkets although sentiments on supplier management policies and customer management policies were largely contested as shown by a standard deviation of above 1.0. Table 4.4 presents the mean and standard deviation results for stakeholder management policies.

Table 4: Mean and Standard Deviation on use of Stakeholder Management Policies

Stakeholder Management Policies	N	Mean	Std. Dev	Variance
Indicate the extent to which supplier management policy is used in your supermarket	74	3.50	1.063	1.130
Indicate the extent to which employee management policy is used in your supermarket	74	3.77	.987	.974
Indicate the extent to which customer management policy is used in your supermarket	74	3.95	1.058	1.120

Relationship between inventory control policies and supply chain performance

The study sought to examine the relationship between inventory control policies and supply chain performance by asking respondents to rate on a 5 point likert scale, the extent to which

their inventory control policies affected decision making, profits and costs. According to the results, decision making had a mean 3.47 and SD. of 1.285, profits had a mean score of 3.70 and SD. of 0.918 and costs had a mean of 3.65 SD of 0.867. Therefore, from the results, the study concluded that respondents agreed that inventory control policies affected supply chain performance although the decision making factor, which had a standard deviation of 1.285 was highly contested. Table 5 presents the mean and standard deviation results for the relationship between inventory control policies and supply chain performance.

Table 4.5 Mean and Standard Deviation on the relationship between inventory control policies and supply chain performance

Inventory control policies and supply chain performance	N	Mean	Std. Dev	Variance
Rate the extent of improved decision making as a result of your inventory control policies	74	3.47	1.285	1.650
Rate the extent of your improved profits as a result of your inventory control policies	74	3.70	.918	.842
Rate the extent of the reduced costs as a result of your inventory control policies	74	3.65	.867	.752

Relationship between risk management policies and supply chain performance

The study sought to determine the relationship between risk management policies and supply chain performance by asking respondents to rate on a 5 point likert scale, the extent to which their risk management policies affected supply chain disruptions, inventory control failures and inventory shrinkage. According to the results, supply chain disruptions had a mean 3.20 and SD. of 1.260, inventory control failures had a mean score of 3.43 and SD. of 1.048 and inventory shrinkage had a mean of 3.35 SD of 1.175. The results show that although the opinions were highly contested as shown by SD of above 1.0. However, the mean scores did not differ much and therefore the study concluded that risk management policies affect supply chain performance. Table 6, presents the mean and standard deviation results for the relationship between risk management policies and supply chain performance.

Table 4.6: Mean and Standard Deviation on the relationship between risk management policies and supply chain performance

Risk management policies and supply chain performance	N	Mean	Std. Dev	Variance
Rate the extent of reduced supply chain disruptions as a result of your risk management policies	74	3.20	1.260	1.588
Rate the extent of reduced inventory control failures as a result of your risk management policies	74	3.43	1.048	1.098
Rate the extent of reduced inventory shrinkage as a result of your risk management policies	74	3.35	1.175	1.382

Relationship between information technology policies and supply chain performance

The study sought to evaluate the relationship between information technology policies and supply chain performance by asking respondents to rate on a 5 point likert scale, the extent to which their information technology policies affected inventory recording accuracy, order

flexibility and supply chain visibility. According to the results, inventory recording accuracy had a mean 3.78 and SD. of 1.197, order flexibility had a mean score of 3.51 and SD. of 0.848 and supply chain visibility had a mean of 3.50 SD of 0.880. Therefore, from the results, the study concluded that respondents agreed that information technology policies affected supply chain performance although inventory recording accuracy factor, which had a standard deviation of 1.197, was highly contested. Table 7 presents the mean and standard deviation results for the relationship between information technology policies and supply chain performance.

Table 4.7: Mean and Standard Deviation on the relationship between information technology policies and supply chain performance

Information technology policies and supply chain performance	N	Mean	Std. Dev	Variance
Rate the extent of improved inventory record accuracy as a result of your information technology policies	74	3.78	1.197	1.432
Rate the extent of improved ordering flexibility as a result of your information technology policies	74	3.51	.848	.719
Rate the extent of improved supply chain visibility as a result of your information technology policies	74	3.50	.880	.774

Relationship between stakeholder management policies and supply chain performance

The study sought to establish the relationship between stakeholder management policies and supply chain performance by asking respondents to rate on a 5 point likert scale, the extent to which their stakeholder management policies affected supplier relations, employee efficiency and customer loyalty. According to the results, supplier relations had a mean 3.68 and SD. of 1.035, employee efficiency had a mean score of 3.89 and SD. of 1.015 and customer loyalty had a mean of 4.15 and SD of 0.961. Although the supplier relations factor and employee efficiency factor were highly contested by respondents as shown by their standard deviations of above 1.0 the mean scores did not differ much and therefore the study concluded that stakeholder management policies affect supply chain performance. Table 8 presents the mean and standard deviation results for the relationship between stakeholder management policies and supply chain performance.

Table 4.8: Mean and Standard Deviation on the relationship between stakeholder management policies and supply chain performance

Stakeholder management policies and supply chain performance	N	Mean	Std. Dev	Variance
Rate the extent of improved supplier relations as a result of your stakeholder management policies	74	3.68	1.035	1.071
Rate the extent of improved employee efficiency as a result of your stakeholder management policies	74	3.89	1.015	1.029
Rate the extent of improved customer loyalty as a result of your stakeholder management policies	74	4.15	.961	.923

Supply Chain Performance of Supermarkets

The study sought to examine supply chain performance of supermarkets as the dependent variable. To examine the relationship between inventory management policies and supply chain

performance, key supply chain performance indicators consisting of quality, lead time and cost were quantitatively assessed. Respondents were asked to indicate on percentage basis the level at which the three key supply chain performance indicators were being achieved as a result of their supermarkets inventory management policies. The results showed that majority of the respondents (49.5%) agreed that inventory management policies improved the quality of goods delivered in the supermarkets by 11%-15%, reduced lead time by 16%- 20% and reduced total inventory costs by 16%- 20%. The results for percentage quality improvement are shown in table 4.9 while those for percentage lead time reduction are presented in table 10 and those for percentage reduction in total inventory costs are presented in table 11.

Table 4.9. Percentage of improvement in the quality of goods delivered

Indicate the percentage of improvement in the quality of goods delivered.	Frequency	Percentage (%)
0-5%	3	4.1
6-10%	7	9.5
11-15%	34	45.9
16-20%	18	24.3
Over 20%	12	16.2
Total	74	100

Table 4.10: Percentage reduction in lead time

Indicate the percentage reduction in lead time	Frequency	Percentage (%)
0-5%	1	1.4
6-10%	6	8.1
11-15%	32	43.2
16-20%	34	45.9
Over 20%	1	1.4
Total	74	100

Table 4.11: Percentage reduction in total inventory costs

Indicate the percentage reduction in total inventory costs	Frequency	Percentage (%)
0-5%	4	5.4
6-10%	11	14.9
11-15%	20	27.0
16-20%	32	43.2
Over 20%	7	9.5
Total	74	100

Further results on supply chain indicators pointed that improvement in the quality of goods delivered a mean of 3.43 and SD of 0.923, lead time reduction had a mean of 3.38 and SD of 0.716 and total inventory cost reduction had a mean of 3.36 and SD of 1.028 although with reduced total inventory costs, the opinions of the respondents were highly contested as indicated by a SD of above 1.0. However, from the results, the study concluded that inventory management policies improved supermarkets supply chain performance in Nairobi County. Table 12 shows the mean and standard deviation of supply chain performance of supermarkets in Nairobi County.

Table 4.12: Mean and Standard Deviation of Supply Chain Performance of Supermarkets

Supply Chain Performance Indicator	N	Mean	Std. Dev	Variance
Percentage improvement in the quality of goods delivered	74	3.43	.923	.852
Percentage reduction in lead time	74	3.38	.716	.512
Percentage reduction in total inventory Costs	74	3.36	1.028	1.057

Inventory management policy weaknesses in supermarkets supply chains

The study sought to establish the prevalence of inventory management policy weaknesses in Nairobi supermarkets supply chains by asking respondents to indicate the extent to which poor planning and coordination, employee incompetence, deliberate override of controls and prolonged late payment to suppliers were prevalent as a result of inventory management policy weaknesses. According to the results, poor planning and coordination had a mean 1.72 and SD. of 0.899, employee incompetence had a mean score of 2.19 and SD. of 1.081, deliberate override of inventory controls had a mean of 2.31 SD of 0.920 and prolonged late payment to suppliers had a mean of 2.19 and SD of 1.106. From the results, the study concluded that inventory management policy weaknesses have an adverse effect on supply chain performance. Table 13 presents the mean and standard deviation results for inventory policy weaknesses in supermarkets supply chains in Nairobi County.

Table 13: Mean and Standard Deviation of inventory management policy weaknesses in supermarkets supply chains

Prevalence of inventory management policy weaknesses in supermarkets supply chains	N	Mean	Std. Dev
Poor planning and coordination	74	1.72	.899
Employee incompetency	74	2.19	1.081
Deliberate override of inventory controls	74	2.31	.920
Prolonged late payment to suppliers	74	2.19	1.106

4.3 Inferential Analysis

4.3.1 Correlation

The study conducted correlation analysis to determine the relationship between inventory management policies and supply chain performance. Statistical Package for Social Scientists (SPSS) version 21 was used to code, enter and compute Pearson correlation coefficient (r). According to Boslaugh (2012), Pearson correlation coefficient is a statistical measure of linear relationship between two variables whose value ranges from -1 (when there is a perfect negative

correlation) to +1 (when there is a perfect positive correlation) and the closer the value to zero the smaller is the degree of linear association. Results shown in Table 14 found a positive relationship between inventory control policies and supply chain performance as indicated by a positive Pearson correlation ($r=.690$, $P=0.000<0.05$); a positive relationship between risk management policies and supply chain performance ($r=.448$, $P=0.000<0.05$); a positive relationship between information technology policies and supply chain performance ($r=.273$, $P=0.018<0.05$) and a positive relationship between stakeholder management policies and supply chain performance with a correlation of ($r=.410$, $P=0.000<0.05$).

Table 4.14: Correlation

		Inventory Control Policies	Risk Management Policies	Information Technology Policies	Stakeholder Management Policies
Inventory Control Policies	Pearson Correlation Sig. (2-tailed)	1			
Risk Management Policies	Pearson Correlation Sig. (2-tailed)	.690** 0	1		
Information Technology Policies	Pearson Correlation Sig. (2-tailed)	.448** 0	.396** 0	1	
Stakeholder Management Policies	Pearson Correlation Sig. (2-tailed)	.273* 0.018	.392* 0.001	.410** 0	1
	N	74	74	74	74

4.3.2 Regression Analysis

The coefficient of determination R square (R^2) was used to measure how far the regression model was able to explain the variation in the dependent variable due to changes in the independent variables and then adjusted to measure the proportion of variation that could only be explained by those independent variables that really aid in explaining the dependent variable. Table 4.15 shows the regression model summary results.

Table 4.15: Regression Model Summary

Model	R	R²	Adjusted R Squared	Std. Error of the Estimate
1	.833	.693	.672	.009

From the findings, the value of adjusted R squared was 0.672 indicating that there was a variation of 67.2 percent on supply chain performance due to changes in inventory management policies at 95 percent confidence interval which meant that 67.2 percent changes in supply chain performance could be associated with changes in the organization’s inventory management policies with the remaining 32.8 % being explained by other variables that were not captured in

this study's model. Further, results of the correlation coefficient R, which shows the relationship between the study variables stood at 0.833 indicating the existence of a strong positive relationship between inventory management policies and supply chain performance.

4.3.3 Analysis of Variance (ANOVA)

The study used Analysis of Variance (ANOVA) to assess the significance of the overall multiple regression model so as to determine whether it was fit to test the relationship between inventory management policies and supply chain performance. The study results of the ANOVA Test or F-test indicate a high degree of fit as reflected by an F value of 9.871. Since the calculated F-count value 9.871 was greater than the F-critical value 1.984 (table) and the significance level of $0.010 < 0.05$, the study concluded that the four sets of independent variables had a significant relationship with the supply chain performance of supermarkets (Y-dependent variable) in Nairobi County, Kenya and that the overall multiple regression model was significant. Table 4.16 presents the ANOVA results.

Table 4.16: ANOVA results

	Sum of squares	d.f	Mean square	F	Sig.
Regression	22.622	4	5.656	9.871	0.01
Residual	39.54	69	0.573		
Total	62.162	73			

NB: F-critical Value = 1.984

4.3.4 Regression Model Coefficients

The study conducted a multiple regression analysis to determine the relationship between inventory management policies and supply chain performance of retail supermarkets in Nairobi, Kenya. The results of multiple regression analysis obtained regression coefficients, t value and significance level as indicated in Table 4.17

From the data obtained in table 17 the established regression equation became:

$$\text{Supply chain performance} = 2.385 + 0.324 (\text{Inventory control policies}) + 0.337 (\text{Risk management policies}) + 0.298 (\text{Information technology policies}) + 0.017 (\text{Stakeholder management policies})$$

Table 4.17: Coefficients

Model	Unstandardized Coefficients		Standardized coefficients		
	β	Std. Error	β	t	Sig.
(Constant)	2.385	.651		1.789	.009
Inventory control policies	.324	.081	.065	.271	.038
Risk management policies	.337	.085	.036	.267	.014
Information technology policies	.298	.079	.052	.367	.003
Stakeholder management policies	.017	.059	.033	.148	.017

The regression equation results indicated that when inventory management policies are held at a constant zero, the supply chain performance of retail supermarkets in Nairobi City County would be 2.385. Additionally, the study results also revealed that holding all other factors constant, a unit increase in inventory control policies resulted in 0.324 increase in the supply chain performance while a unit increase in risk management policies resulted in 0.337 increase in supply chain performance and a unit increase in information technology policies resulted in 0.298 increase in supply chain performance while a unit increase in stakeholder management policies resulted in 0.017 increase in supply chain performance. This inferred that risk management policies followed by inventory control policies contributed most to supply chain performance of retail outlets in Nairobi County and that based on 5% significance level, all the variables were significant since $p < 0.05$.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study revealed that supermarkets in Nairobi used inventory control policies to manage their inventories. Respondents also affirmed that inventory control policies improved decision making and profits and reduced costs. A further regression analysis test of correlation revealed a close association between inventory control policies and supply chain performance. This implies that proper inventory control policies which guide forecasting, ordering and monitoring of inventory play a significant role in improving supply chain performance. Therefore, the study concludes that there is a significant relationship between inventory control policies and supply chain performance of retail supermarkets in Nairobi County in Kenya. The study also revealed that supermarkets in Nairobi used risk policies to manage their inventories. Respondents also affirmed that risk control policies reduced supply chain disruptions, inventory control failures and inventory shrinkage thus improving supply chain performance. Further, the study revealed that the risk variable statistically and positively correlated to supply chain performance as evidenced by regression analysis test of correlation results. This implies that proper risk management policies play a significant role in improving supply chain performance. The study therefore concludes that there is a significant relationship between risk management policies and supply chain performance of retail supermarkets in Nairobi, Kenya. Additionally, the study revealed that supermarkets in Nairobi used information technology policies to manage their inventories. Respondents also affirmed that information technology policies improved inventory recording accuracy, ordering flexibility and supply chain visibility. Further, the study revealed that the variable statistically and positively correlated to supply chain performance as evidenced by regression analysis test of correlation results. This implies that information technology policies which guide the use of Electronic Point of Sale, Vendor Managed Inventory and Radio Frequency Identifiers play a significant role in improving supply chain performance. The study therefore concludes that there is a significant relationship between information technology policies and supply chain performance of retail supermarkets in Nairobi County in Kenya. Further, the study revealed that supermarkets in Nairobi used stakeholder management policies in their supermarket. Respondents also affirmed that stakeholder management policies improved supplier relations, employee efficiency and customer loyalty all of which consequently led to improved supply chain performance. Further, the study revealed that the variable statistically and positively related to supply chain performance as evidenced by regression analysis test of

correlation results. This implies that stakeholder management policies play a significant role in improving supply chain performance. Therefore, the study concludes that there is a significant relationship between stakeholder management policies and supply chain performance of retail supermarkets in Nairobi County, Kenya.

5.2 Recommendations

The study recommends supermarkets supply chain managers to periodically assess, review and where necessary redesign their inventory management policies so as to ensure that they are effective and adequate in controlling inventory levels and the associated inventory risks. Also, to maximize on the benefits of information technology in managing inventory, the study recommends that supermarkets should regulate the use of information technology by instituting appropriate and effective policies that allow sharing of inventory data and information within the organizations acceptable limits. Further, the study recommends retail investors and their supply chain managers to train and monitor employees who handle their inventory and be at the forefront in ensuring that their supermarkets comply with the set stakeholder management policies so to encourage good relations and timely payment to suppliers, employee efficiency and customer loyalty.

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