INVENTORY MANAGEMENT PRACTICES AND FINANCIAL PERFORMANCE OF MANUFACTURING FIRMS IN KENYA: CASE OF AGROCHEMICAL FIRMS

BY

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DECLARATION

I, Arthur Mulumba, hereby submit my research project for examination, entitled "Inventory Management Practices and performance of manufacturing firms in Kenya: Case of Agrochemical Firms" and truthfully declare that the above-titled paper is a product of my original research investigation and has not been presented for a degree award in any other institution.

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ARTHUR MULUMBA

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ABBREVIATIONS AND ACRONYMS

EDP	Electronic Data Processing
EOQ	Economic order quantity
GDP	Gross Domestic Product
JIT	Just-in-time
KAM	Kenya Association of Manufactures
SPSS	Statistical Package for Social Sciences
VMI	vendor managed inventory

ABSTRACT

Inventories occupy the most strategic position in the structure of working capital of most firms and enterprises and are an important component to the success and expenditure reduction of a firm. They make up an important part of a manufacturing firm's production process as they facilitate continued production. The general objective of this study is to assess the relationship between inventory management practices and performance of manufacturing firms in Kenya using a case of agro-chemical firms. To achieve this objective, the study will be guided by four specific objectives: to determine the effects of net transactions approach to inventory management on performance of manufacturing firms in Kenya; To establish the effects of the Just in Time (JIT) on performance of manufacturing firms in Kenya; To establish the effects of Vendor Managed Inventory(VMI) on performance of manufacturing firms in Kenya and to determine the influence of forecasting and replenishment on performance of manufacturing firms in Kenya. The study will adopt a descriptive survey design on a population of 65 Agro-chemicals in Kenya. The respondents will collect data from operation managers, procurement managers, procurement officers and stores managers. This study will employ a survey of all the 65 existing firms. The study will target the procurement managers, operations managers and stores managers at the agro-chemical firms. 30% of the target population will be sampled to get 98 respondents for the study. The study will collect primary data using a questionnaire. The collected data will be analyzed using mean, standard deviation, frequencies and percentages. Regression analysis will be used to test for the relationship between the independent variable and the dependent variable. The study concludes that net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance. The study further concludes that implementation of JIT in a company leads to cost reductions in the production system. The study also concludes that VMI is guided by contracts that guide the inventory of the agrochemical firm aimed at improving its performance. The study further concludes that ROE of agrochemical firms had improved due to inventory. The study recommends that the top management of all Manufacturing firms in Kenya should strengthen their abilities of re-planning in order to improve performance. The top management of manufacturing firms in Kenya should adopt pull method whereby goods are produced in each manufacturing stage only as they are needed. Vendor managed inventory systems should be adopted in order to enable manufactures to reduce or exclude inventory leading to higher performance. Forecasting should be geared towards making prediction of the future demand ensuring that performance is high.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

There is a paradigm shift in operations of most organizations due to globalization and increased competition in business environment. Today, businesses face more threats from competitors than ever before. The forces of globalization have reduced the world to small village. In order to stay competitive and enhance financial performance, a greater emphasis is paid on inventory management. Today, advancement in technology has improved the way inventories are managed and therefore enhanced performance. Organizations are leveraging on several technologies to manage their inventories as a way of enhancing their performance. The most common types of technologies being applied in management of inventories by businesses include barcode technology, Radio Frequency Identification (RFID), Distribution Requirement planning (DRP), Automated Inventory tracking system (AITS), the Just-in-Time System, Automatic Identification (Auto ID), vendor managed inventory (VMI) systems (Raviv & Kolka, 2013).

Inventories comprise stocks of raw materials, work in progress, finished goods and supplies held by a business organization to facilitate operations in the production process (Buxey, 2006). Inventory management is concerned with maintaining stock levels of a given group of items with the aim of minimizing the inventory handling and ordering costs consistent with other relevant targets and objectives set by management (Obura, 2015). They represent those items which are either accumulated for sale or they are in the process of manufacturing or in the form of materials, which are yet to be utilized (Stevenson, 2010). Inventories make up an important part of a manufacturing firm's production process as they facilitate continued production. The manner in which inventories are managed affects the performance of an organization because it contributes to the cost of production which later affects profitability. In order to manage inventories efficiently and optimize organization performance, organizations normally have an inventory management system which monitors the flow of inventories so as to ensure that there is neither oversupply nor undersupply in the production process of a manufacturing firm.

Etim, John and Ime (2014) established that inventory management practices can improve the operational performance of a firm through efficiency in capital utilization, increased service level, and reduced lead time and that firms that implement inventory management models are able to handle material shortages, product stock outs, and component pile up. But this study did not research on how inventory management practices impacts on firm's productivity. While Brealy, Myers and Marcus (2007) state that there are prerequisite for production, inventories can be expensive to store as they tie up capital. Inventory management therefore calls for tradeoff between these costs and benefits. The cost of holding inventory includes not only the opportunity cost but also the storage and insurance costs, and the risk of spoilage or obsolescence. All these carrying costs encourage firms to hold current assets to the minimum. Inventory mismanagement will adversely affect an organization's operations by arresting financial resources that could have been channeled to other profitable sectors and/or activities.

Several studies have been conducted on inventory management and organizational performance. For instance, Nsikan, Etim and Imec (2015) examined inventory management practices and operational performance of flour milling firms in Lagos, Nigeria. The findings indicated that most of the medium-sized flour milling firms adopted different inventory management strategies from the scientific models with the exception of the large manufacturing companies. The inventory management strategies and policies adopted by the flour milling firms were based on factors such as prevailing industry practices, changing level of customer demand, forecast estimates and guesses, and available production capacity. Adeyemi and Salami (2010) identified several inventory management best practices including: just in time, vendor managed inventory, collaborative planning, forecasting and replenishment, automatic replenishment, agile system, and material requirement planning.

According to Koumanakos (2008), the tradeoff between ordering costs and holding costs characterizes the transactions approach to inventory management represented by the Economic order quantity EOQ models of inventory. In another study, Lwiki, Ojera, Mugenda and Wachira (2013) examined the impact of inventory management practices on

financial performance of sugar manufacturing firms in Kenya. The results indicate that there exists a positive correlation between inventory management and Return on Sales.

Mukopi and Iravo (2015) conducted an analysis of the effects of inventory management on the performance of the procurement function of sugar manufacturing companies in the Western Kenya Sugar Belt. The findings show a strong relationship between the four variables; lean inventory systems, strategic supplier partnerships, information technology, legal policies and the effect of inventory management on performance of the procurement function of sugar manufacturing companies in the western sugar belt.

As seen from the above discussions, the existing studies have concentrated on inventory management and organization performance from other economies. For those conducted in Kenya, they concentrated mainly on sugar firms whose operating environment cannot be compared with the chemicals manufacturing firms. This study therefore sought to provide in-depth information on the relationship of inventory management practices among chemical manufacturing firms in Kenya using a case of Henkel Chemicals.

1.1 Inventory Management Practices

Organization's inventory is an important component and its management is vital to the success and expenditure reduction of a firm. Consequently, other operational costs may increase inventory management costs like through the balance of ordering costs, holding costs, safety stock and stock outs (Palevich, 2012) and (Leong,Wisner & Tan, 2011). Once an organization realizes this, it can develop online inventory management tool that monitors its inventory information by breaking it down into groups by correlating the categories with its customers.

Wild (2004) recommends, proper warehousing of inventory so that when goods are ordered, they are held at the warehouse for the least time possible minimizing holding cost of inventory. Bacchetti, Plebani, Saccani and Syntetos (2010) argue that inventory management needs to be organized in a logical way to facilitate the organization knowledge of when to order and quantity to order. Economic order quantity enables organizations plan their inventory replenishment on a timely basis such as monthly, quarterly, half yearly or yearly basis.

Just-in-Time (JIT) is a philosophy of manufacturing based on planned elimination of all waste and continuous improvement of productivity. Just-in-time (JIT) contributes greatly to an organization's positive performance and customer satisfaction. JIT production according to Eckert (2007) is making what the customer needs, when it is needed and in the quantity needed using the minimum resources of people, material, and machinery. The primary elements of JIT include having only the required inventory when needed; to improve quality to zero defects; to reduce lead time by reducing set-up times, queue lengths and lot sizes; and to accomplish these things at minimum cost. In order to achieve this, the process must have signals of what is going on everywhere within that process. JIT emphasizes that production should create items that arrive when needed, neither earlier nor later. Quick communication of the consumption of old stock, which triggers new stock to be ordered, is key to JIT and inventory reduction. Keeping moderate inventory is good and it enables an organization operate minimal expenses of holding and setup costs, eliminate unwanted lead time and produce goods as per customers order. This saves up warehouse space and costs.

Some organizations have resorted to vendor managed inventory (VMI) systems which aid the supplier to monitor customer's inventory usage. Vendor-managed Inventory (VMI) is a practice in which inventory replacement decisions are centralized with upstream manufacturers or distributors (Frahm, 2003). It is a new feature of supplier partnership in which emphasis is on good working relations and communication between customers and suppliers. Through this VMI system, customers will avoid stock outs because the suppliers will have already replenished their inventory. The manufacturer enters into a collaborative or partnership agreement with the distributor, under which the latter agrees to stock a specified range of items and meet specified service levels. In return, the customer undertakes to buy the specified items solely from the distributor and no longer keeps the items in stock. It enhances working capital due to the elimination of the need for customers to reorder, reduce or exclude inventory and obviate stock outs. It relieves the customer of much of the expense of ordering, shipping the materials, counting inventory and stocking low-value items. By passing these costs normally managed by the customer on the supplier, the customer is able to reduce the overall cost of product and increase on margins. There's

also reduced lead times with enhanced sales and a reduction of lost sales due to stock outs (Irungu & Wanjau, 2011).

Forecasting and replenishment helps to develop free flowing order fulfillment and delivery systems, so that pipeline inventories can be substantially reduced (Baily, Farmer, Barry, Jessop & David, 2008). According Lysons and Farrington (2006), influential thinkers in supply chain management have suggested that inventory is waste and should be avoided wherever possible. The reasons behind this view are stocks of material can adversely impact any organization because they tie up capital. However they did not clarify the solution to excess inventory held by business firm. It is also argued that stocks are frequently held for wrong reasons sometimes to mask inefficiencies in the management of organization (Rushton, Croucher & Baker, 2011)

1.1.2 Financial Performance

Organizational performance refers to how well an organization meets its financial goals and market criteria (Li, Rao, Ragu-Nathan & Ragu-Nathan, 2005). Organizational performance is how well an organization achieves its market oriented goals as well as the financial goals. Maduenyi, Oke, Fadeyi and Ajagbe (2015) define organizational performance as a set of financial and nonfinancial indicators which offer information on the degree of achievement of objectives and results). Organizational performance concerns both effectiveness and efficiency; the quality and quantity of work (Olumuyiwa, Adelaja & Chukwuemeka, 2012). The relevant items adapted to measure organizational performance includes higher sales, higher accuracy in costing, and improved coordination between departments, improved coordination with suppliers, and improved coordination with customers. Any organizational initiative, including supply chain management should ultimately lead to enhanced organizational performance (Maduenyi *et al.,* 2015).

Organization performance is measured in different ways depending on the purpose of measurement. Kaplan and Norton (2004) classify organization performance into financial and non-financial using the Balanced Scorecard. Demirbag, Koh, Tatoglu and Zaim (2006) also note that organizational performance can be measured from both financial and non-financial criteria. The measures of financial goals include profit, return on investment, sales

growth, business performance, and organization effectiveness. On the other hand, the measures of non-financial criteria are innovation performance and market share (Demirbag *et al.,* 2006), quality improvement, innovativeness and resource planning. Most organizations view their performance in terms of "effectiveness" in achieving their mission, purpose or goals (Koh, Nam, Prybutok & Lee, 2007). Performance is a summary measure of the quantity and quality of work done, with resource utilization taken into account. It can be measured at the individual, group, or organizations level. Performance may be expressed as success into dimensions of organizations productivity, effectiveness and efficiency (Olumuyiwa *et al.,* 2012). To define the concept of performance is necessary to know its elements characteristic to each area of responsibility. Organizational performance could also refer to any job related activities expected of a worker and how well those activities are executed. This study applied financial performance measures that are derived from the recorded profitability.

1.1.3 Manufacturing firms in Kenya

The manufacturing is very important sector in Kenya as it makes a substantial contribution to the country's economic development. The sector is one of the key economic pillars in the vision 2030 geared to make the nation a middle level income country by the year 2030. Kenya has a large manufacturing firm serving both the local market and exports to the East African region and the rest of the world. Manufacturing firms in Kenya are characterized by elongated or overextended chains of retailers which, in turn, mean long chains of transactions between chain members and consumers (Amoro, 2011). World firm (2007) showed that leading manufacturing firms in Kenya are faced with problems of wrong forecasting due to lack of enough inventory management information

According Kenya Association of Manufactures (KAM, 2014) there are 700 registered manufacturing firms in Kenya. Some of the most common manufacturing industries in Kenya include small-scale consumer goods (plastic, furniture, batteries, textiles, clothing, soap, cigarettes and flour), agricultural products, horticultural products, oil refining, aluminum and steel industries, lead industries and cement industries. Manufacturing is one of the key sectors expected to deliver the economic growth rate per annum for Kenya, by increasing and sustaining its contribution to Gross Domestic Product (GDP). The sector

also supports the country's social development agenda through creation of jobs, poverty alleviation, and generation of foreign exchange and attraction of local and foreign investment.

1.1.4 The Agrochemical industry in Kenya

The agrochemical industry in Kenya is controlled by the government through the Pest Control Products Board (PCPB). The industry is valued at a rough estimate of 80m USD at cost insurance and Freight value because majority of their chemicals used in the production of their products are imported (Croplife Kenya 2010). The industry is inhabited by big multinational Research and Development companies like Syngenta, Bayer, Dow Agroscience, Monsanto and Dupont. The multinationals control about 60 – 70 % of the total global market (Croplife, 2009). These companies heavily rely on global sourcing and supply chain management for their input which means that they have to have a strong inventory management practice to ensure that they do not overstock nor they experience shortages as it may take long for the supply to arrive for continued production. The inventory management practices need to be appropriate in order for them to achieve reductions in costs and thus meet market demand.

1.2 Statement of the Problem

Inventories occupy the most strategic position in the structure of working capital of most firms and enterprises (Ndunge, 2013). Good inventory management in any manufacturing organization saves the organization from poor quality production, disappointment of seasoned customers, loss of profit and good social responsibility. One of the key factors for the success of a firm is effective flow management in supply chains. The biggest challenge in managing inventory is to balance the supply of inventory with demand. A firm would ideally want to have enough inventories to satisfy the demands of its customers and avoid lost sales due to inventory stock-outs. Also, the firm does not want to have too much inventory staying on hand because of the cost of carrying inventory. Enough but not too much is the ultimate objective (Coyle & Bardi, 2003)

A good inventory control system is attained in balancing the two objectives to a firms' optimum advantage. Eshun (2014) point out that despite the benefits of inventory

management, organizations have continuously ignored the potential savings from proper inventory management and end up having more funds invested in inventory than necessary. They are therefore not able to meet customer demands because of poor distribution of investment among inventory items hence the basis of this study. In majority of manufacturing industries, inventory constitutes the most significant part of current assets (Songet, 2006). Manufacturing firms attain significant savings from effective inventory management which amounts between 50% - 60% of total costs. A potential 6% saving on total cost through effective inventory management is achievable. In this view, the study wishes to assess the effect of inventory management practices on the performance of manufacturing firms in Kenya.

A number of studies have been carried out in this area. Globally, Bai and Zhong (2008) studied on improving inventory management in small business in Sweden Koumanakos (2008) studied the effect of inventory management on firm performance in manufacturing firms in Greece. Regionally, Asare and Prempeh (2016) studied the impact of efficient inventory management on profitability in selected manufacturing firms in Ghana. Augustine and Agu (2013) examined the effect of Inventory Management on organizational effectiveness in Nigeria.

Locally, Ndunge (2013) examined inventory management and productivity of large manufacturing firms. Mwangi (2013) examined inventory management and supply chain performance of non-governmental organizations in the agricultural sector. This study therefore sought to answer the following research question: what is the relationship between inventory management practices and financial performance of manufacturing firms in Kenya?

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of this study was to assess the relationship between inventory management practices and financial performance of manufacturing firms in Kenya using a case of agro-chemical firms

1.3.2 Specific Objectives

The study was guided by the following specific research objectives

i. To determine the effects of net transactions approach to inventory management on financial performance of manufacturing agrochemical firms in Kenya.
ii. To establish the effects of the Just in Time (JIT) on financial performance of manufacturing agrochemical firms in Kenya
iii. To establish the effects of Vendor Managed Inventory(VMI) on financial performance of manufacturing agrochemical firms in Kenya
iv. To determine the influence of forecasting and replenishment on financial performance of manufacturing agrochemical firms in Kenya

1.4 Research Questions

i. What is the effect of net transactions approach to inventory management on financial performance of manufacturing agrochemical firms in Kenya?
ii. How does the Just in Time (JIT) affect financial performance of manufacturing agrochemical firms in Kenya?
iii. What is the effect of vendor managed inventory on financial performance of manufacturing agrochemical firms in Kenya?
iv. How does forecasting and replenishment influence financial performance of manufacturing agrochemical firms in Kenya?

1.5 Significance of the Study

The study would be beneficial to manufacturing firms as it would provide information that will help in understanding inventory management practices, their mode of application and their practical relevance in the firm. The top management of manufacturing firms in Kenya would rely on the findings of the study in establishment of sound inventory management practices geared towards improvement in financial performance. The findings of the study would provide a framework for top management of manufacturing firms to make good and wise decisions concerning inventory management practices.

Policy makers would be guided in formulating appropriate policies to will regulate the industry. Some of the policy makers include relevant regulatory bodies like the Kenya Association of Manufacturers a lobby group of manufacturing firms in Kenya. In formulation of policies, the study would offer meaningful findings especially in regard to inventories, replenishment and ordering that maximizes revenues.

Future scholars and academicians would also benefit since the study would form a basis for further studies in the field of inventory management and performance of organizations, especially in the manufacturing sector. They may find relevant information that may fit in with their study of inventory management. The study would establish areas for further research that would be of great help to these scholars.

1.6 Scope of the Study

The study was to be carried out in manufacturing companies in Kenya. The study was carried out in July 2016 and the respondents included inventory managers, procurement managers, procurement officers and the purchasing managers. It focused on the effects of net the transactions approach, Just in Time (JIT) purchasing policy, Vendor Managed Inventory (VMI), forecasting and replenishment on the performance of manufacturing firms in Kenya.

1.7 Justification of the Study

The importance of Manufacturing Firms is now widely accepted in both developed and developing economies. The inherent strength of Manufacturing Firms is to efficiently manage their inventories to enhance their performance. Efficient management of inventories in manufacturing firms shall minimize wastage and therefore increased efficiency which leads to financial performance. This shall have a significant influence on economic growth as indicated by job creation.

The study would not only be useful to manufacturing firms in Kenya. The findings of the study would also be applicable across firms in different sectors of the economy that accumulate inventories. Such companies would be in position to tailor manage their inventories in line with the production/operation schedules and make targeted marketing decisions that enhances profitability.

1.8 Limitations of the Study

The study anticipated that the managers and officers might be too busy to take part in the study. This may be taken care of by using the 'drop and pick later' method to administer the research instruments to enable the participants to fill them at their time. There study would also experience difficulties when selecting a sample population form the entire population

1.9 Assumptions

The study assumed that the respondents are knowledgeable about the inventory management practices being carried out in the manufacturing companies and they clearly understand the areas covered in the questionnaire well enough to provide relevant answers. It also assumed that information given is correct devoid of any alterations.

1.10 Definition of Terms

Inventory: Assets that help an organization to facilitate operations in the production process and include raw materials, work in progress, finished goods parts and components (Axsäter, 2015).

Inventory Management Practices: Measures put in place to ensure adequate stock of raw materials, work in progress, finished goods parts and components are in place to enhance the operations of an organization (Barrett, 2015).

Financial Performance: A measure of the output of an organization versus the inputs. It shows how resources of an organization including inventories have been utilized to by an organization to create value for shareholders (Epstein, Buhovac & Yuthas, 2015).

Just in Time: Is a philosophy in management where production is in response to demand. It is geared towards elimination of non value adding activities (Vokurka & Lummus, 2000).

Vendor Managed Inventories: Describes a situation where all decisions on inventories for example replenishment are made by suppliers on behalf of the business (Stadtler, 2015).

Forecasting: Is predetermination of future status of an activity for enhanced decision making especially planning (Box *et al.*, 2015).

Replenishment: Refers to restocking or refilling of items that are out of stock in an organization to facilitate normal operations (Taleizadeh *et al.*, 2015).

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter contained the theoretical review where theories explaining inventory management were explained, the empirical review where previous studies carried out on the topic were looked at and the conceptual framework stating the independent and the dependent variables.

2.2 Theoretical Review

2.2.1 Inventory Control Theory

Zappone (2014) stated that managing all kinds of assets in an organization can be viewed as an inventory problem. For the large companies they use a variety of inventory control theories and mathematical formulas to help them optimize the production and storage of many thousands of units of products and to help them minimize costs. At the same time the small-business owners can use ideas from several inventory control methods to manage their production and storage based on their cost-containment and customer service needs.

Any inventory manager's goal within an organization is to minimize cost and maximize profit while satisfying customer's demands. Too much inventory consumes physical space, creates a financial burden, and increases the possibility of damage, spoilage and loss (Zappone, 2014) further explains that excessive inventory frequently compensates for sloppy and inefficient management, poor forecasting, haphazard scheduling, and inadequate attention to process and procedures. Too little inventory often disrupts manufacturing operations, and increases the likelihood of poor customer service. In many cases good customers may become dissatisfied and take their business elsewhere if the desired product is not immediately available. Companies with very high inventory ratios have more possibilities to be bad financial performers. Shah and Shin (2007), reported a strong negative relationship between the cash conversion cycle and corporate profitability for a large sample of public American firms.

Firms with abnormally high inventories have abnormally poor stock returns, firms with abnormally low inventories have ordinary stock returns while firms with slightly lower than average inventories perform best over time. Shah and Shin (2007) also stated that reducing inventories has a significant and direct relationship with a firm's financial and operational performance.

2.2.2 Lean Theory

Lean theory is an extension of ideas of Just-in-Time. The theory eliminates buffer stock and minimizes waste in production process (Green & Inman, 2005). Inventory leanness positively affects the profitability of a business firm and is the best inventory control tool. Firms that are leaner than industry average generally see positive returns to leanness (Eroglu & Hofer, 2011). The theory elaborates on how manufacturers gain flexibility in their ordering decisions, reduce the stocks of inventory held on site and eliminate inventory carrying costs. Scholarly studies indicate that companies successfully optimize inventory through lean supply chains practices to achieve high levels of asset utilization and customer satisfaction leading to improved growth, profitability and market share. Criticism leveled against the theory is that it can only be applicable when there is a close and long-term collaboration and sharing of information between a firm and its trading partners.

According to Trujillo-Barrera (2014) leanness involves five principles: value whereby before business practices are changed it is first determined whether applying lean inventory techniques will actually generate business value. The second principle involves flow where to determine both your business value and the economic value you offer customers; you must understand how inventory flows in your warehouse. The third principle involves pull and it states that once you are fully aware of how your inventory flows and you've worked to eliminate inventory waste, pulling inventory only when requested by your customer, will become a natural outcome. The fourth principle is responsiveness and it involves a continuous and rigorous evaluation of your inventory flow along with effective demand management allows you to respond and adapt quickly to changes in the market. It will also keep the inventory at appropriate levels, preventing unnecessary storage costs and obsolete inventory. The last principle is perfection. It requires you to commit to a continuous

refinement of your inventory management processes; doing so will result in improved quality, cycle time, efficiency and cost.

2.2.3 Theory of Constraints

This is a management philosophy that seeks to increase manufacturing through identifying the limiting factors constraining the process and systematically improving that constraint until it is no longer the limiting factor. Some of the limiting factors that may exist in the manufacturing process include: very long lead times, large number of unfulfilled orders, high level of unnecessary inventories or lack of relevant inventories, wrong materials order, large number of emergency orders and expedition levels, lack of customers engagement, absence of control related to priority orders which implies on schedule conflicts of the resources (Boyd & Gupta, 2004). The theory emphasizes focus on effectively managing the capacity and capability of these constraints to improve productivity and this can be achieved by manufacturing firms applying appropriate inventory control practices. Theory of constraints is a methodology whose basis is applied to production for the minimization of the inventory (Cooper & Ellram, 1993).

2.3 Empirical Review

2.3.1 Effects of Net Transactions Approach on Financial Performance

Net transactions approach also referred to as net change is a form of material requirements planning. This approach main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance. Labadi and Chen (2010) in a journal on modeling, analysis and optimization of supply chains by using Petri net models: the state-of-the-art. They found out that this approach offers the user the ability to re-plan at high frequency, or continuously in a transaction-driven system. The net change approach calls for partial explosion and will relate only to those items affected by a change since the last explosion. The approach is transaction-driven rather that time-driven and is often processed daily or in some situations on a real-time. With net change the planned orders and their associated requirements are not erased but will be rebalanced if a transaction has affected the inventory, bills of material or requirements. Net change has the advantage of being more responsive to change, being continually up to date and evening

out the work load due to less output per run (Labadi & Chen, 2010). The study however did not clearly outline the methodologies, neither are the objectives made clear. The current study examined how net transaction approach affected performance.

Atali, Lee and Özer, (2009) in the study 'If the inventory manager knew: Value of visibility and RFID under imperfect inventory information' state that netting inventory transactions is an extremely important since the warehouse staff uses it to continually update the accuracy of its inventory records. Inventory record accuracy is needed to ensure that replacement items are ordered in a timely manner, that inventory is properly valued, and that parts are available for sale or production when needed. Netting inventory transactions is also needed to ensure that the actual and recorded inventory amounts are the same at the end of the year, so that there will be no issues when the inventory is audited. Reconciling inventory transactions is not as simple as adjusting the book balance to match the physical count. There may be other reasons why there is a difference between the two numbers that cannot be corrected with such an adjustment (Atali, Lee & Özer, 2009). It is not clear whether net transaction was one of the objectives of the study by Atali, Lee and Özer, (2009), as objective of the study have not been explicitly stated.

According to Reinhard (2015) netting all available inventory transactions helps firms to identify transaction errors, uncover irregularities, provides added comfort that the transactions are recorded correctly and also assists in monitoring all the transactions of a business. This approach is very crucial as managing inventory transactions is made easier and more focus put to achieving the organizational goals and objectives.

Nebart (2010) examined the management of inventories in Kenya with a case of a case of the horticultural industry. The study objective was to determine the various inventory management practices used by in the Kenyan horticultural industry. The study used questionnaires as the preferred data collection tool. These questionnaires had both closed and open ended questions. The study findings revealed that horticultural firms adopt various inventory management practices so as enhance performance. The study was done in horticultural sector, but the current study was done in manufacturing firms.

Thige (2010) studied netting as an inventory management practice as adopted by MFI`s in Kenya. The researcher established that a majority of the studied MFI`s manage inventories through various strategies for instance netting. Avutswa (2009) in a study of exporting horticultural firms concluded that the studied horticultural firms adopt netting so as to effectively manage their inventories and therefore performance. The adoption of netting was found to be effective against inventory management. This study was conducted in financial sector, which forms the larger service sector. Need a similar study in manufacturing sector.

2.3.2 Effects of Just in Time (JIT) Purchasing Policy on Financial Performance

JIT is a system that enables companies to produce products in required amounts and just when demanded. Implementation of JIT in a company will lead to cost reductions in the production system. In fact, a JIT production system is very effective in eliminating mainly non value-added activities and thus, non-value added costs. The non-value-added activities are the activities such as moving materials and parts from one place to another; setting up a machine; storing materials, parts and finished goods; inspection, rework and purchasing. These activities, although consume resources, do not add value to a product produced (Dalci & Tanis, 2006).

In a JIT environment, products are produced only when they are demanded by the customers. In this case, equipment only produce products when there is an actual demand for them. At other times equipment are idle. In the JIT environment, the aim is to reduce inventory, increase flexibility, and maximize customer satisfaction by reducing lead-time and increasing quality. Therefore, these (reduction in inventory, defect rates, lead and set up times, increase in quality) will be the appropriate performance measures applicable in a JIT environment. JIT manufacturing system is one of the tools that can be used to enhance competitive advantage. The use of this new production system reduces inventory related costs, increases quality, reduces lead-time, and reduces manufacturing costs by minimizing non-value-added activities and their costs. All these represent the benefits offered by the implementation of JIT production system. By reducing costs and reducing lead-time, company’s response to customer needs increases (Inman, Sale, Green & Whitten, 2011).

Kamakia (2015) noted that the widespread adoption of just-in-time (JIT) inventory principles undoubtedly makes production operations more efficient, cost effective and customer responsive. Companies' effectively implementing JIT principles have substantial competitive advantages over competitors that have not. The trick is figuring out how to apply JIT principles to gain competitive advantages in your specific industry and business situation. The basic premise of JIT is to have just the right amount of inventory, whether raw materials or finished goods, available to meet the demands of your production process and the demands of your end customers. No more, nor less.

Dalci and Tanis (2006) explain that JIT aims at minimizing work-in-progress and finished goods inventory, reducing lead time and increasing product quality. The Pull method is used whereby goods are produced in each manufacturing stage only as they are needed. In the pull system machine operators do not produce according to schedule or material availability. Instead, production does not begin until goods are needed by the end customer. When additional materials or supplies are needed for manufacturing, a message is sent to the preceding work center immediately to send the amount of materials that will be needed. The closer you get to operating JIT situation, the more responsive you are to your customers – and the less capital you have tied up in raw materials and finished goods inventory. The less you spend to store and carry inventory, the less obsolescence you have to write off, and the better you can optimize your transportation and logistics operations. Ultimately, this all translates into saving your company real money (Kamakia, 2015)

JIT production system causes some changes in the company implementing it. First of all, JIT has emerged as an effective cost management tool because it helps to achieve significant costs savings. In a JIT environment there is little or no work-in-process and finished-goods inventories. Performance measures based on production efficiency should be replaced by measures based on lead-time reduction, setup reduction, increased quality and others that help the JIT system to function in the best way (Dalci & Tanis, 2006).

The effects of JIT can be summarized as: Funds that were tied up in inventories can be used elsewhere; areas previously used to store inventories can be used for other more productive uses; throughput time is reduced, resulting in greater potential output and

quicker response to customers and defect rates are reduced, resulting in less waste and greater customer satisfaction.

2.3.3 Effects of Vendor Managed Inventory (VMI) on Financial Performance

Vendor Managed Inventory (VMI) which can also be referred to as Supplier Managed Inventory (SMI) or direct replenishment can be defined as a means of optimizing supply chain performance in which the supplier has access to the customer's inventory data and is responsible for maintaining inventory level required by the customer (Shafie, 2004). In a VMI partnership, the supplier makes the inventory replenishment decision for the firms. This means that the supplier will monitor firm's inventory level (physically or via Electronic Data Processing – EDP) and make periodic re-supply decision, on behalf of the firm, such as order quantities, shipping mode and timing. A company also relinquishes control of its re-supply decision and also transfers financial responsibility for the inventory to the supplier (Kemunto, 2014).

Increased complexity and highly integrated supply chain in current business environment has increased pressure for companies to adapt to current competitive pressure. One of the supply chain tools in addressing these issues is by implementing Vendor Managed Inventory (VMI). Under the VMI arrangement, supplier takes on the responsibility of managing the firm's inventory, which normally includes monitoring, planning and directly replenish inventory at firms' warehouse, for all the products that it supplies. From the operational perspective, under the VMI strategy, suppliers are responsible for firms' inventory control (Disney & Towill, 2003). The supplier normally receives actual data on firm's inventory, sales of goods and demand forecasting based on electronic data interchanges from the firm. Based on this data and information, supplier will determine the maximum and minimum limits of inventory that should be at the firm's site or firm's warehouse at any point of time. Most of the time, this limit will be stated in VMI agreement signed by both parties. The firms will not pay for the goods that were shipped by supplier until the goods were sold to the customer. Under the VMI arrangement, it is the supplier who determines when stocks are to be replenished and in what quantities, instead of passively responding to orders placed by the firm. This arrangement is usually guided by a contract, which specifies the financial terms, inventory constraints and performance target

and expectation such as service measures, firm's and supplier liability and duration of the program.

The main problems faced by manufacturer are long lead-time in sourcing material from international material supplier or producer and also high variability of incoming order from the customer. From customer perspectives, the key issues are high stocks and often delay in replenishment or delivery from manufacturer (Rajagopalan, Lawrence & Krishnadevarajan, 2007). Implementing VMI will enable customer and manufacturer to close this gap. The customer can ensure it will not be short of any parts that is required for its operations, while at the same time allow the reduction in inventory level, which will lead to better cash management. The benefit of the reduced delivery and administration costs, then, is transferred to the end-consumer.

Eventually, both manufacturer and customer have secured competitive advantage through the introduction of VMI Strategic partnership, however, is able to mitigate the above problem and ensure smooth operational performance (Waller, Johnson & Davis, 1999). Quite a number of researches have been conducted to explain how important demand sharing is in ensuring the effectiveness of supply chain management. VMI embodies with some basic understanding between the firms and the supplier. In VMI, the firm will transfer its inventory planning to the supplier while at the same time, the supplier will take ownership managing firm inventory and ensure that firm is able to deliver all that is required to its end-customer. With demand uncertainties from end-customer, shortening product life cycle and increasing request for product customization, making strategic partnership is far more important (Tyan & Wee, 2003).

From operational perspective, using VMI, firms are relieved from the burden to specify, place and monitor purchase order to the supplier while at the same time focus on meeting all end-customer requirement and deliver fullest service level to the end-customer. VMI, from the supplier point of view, could benefit a firm from reducing forecast uncertainties by the firms, reducing logistic costs, reducing overall lead-times, improving service level and reduction of transportation costs (Yao, Evers & Dresner, 2007). Several case studies have indicated that the benefit of VMI in the area of planning and inventory control can be

quite significant. Kaipia, Holmstrom and Tanskanen (2002) demonstrated that VMI has enabled a substantial inventory reduction as well as changing production style from make to stock to make to order production. Through VMI, the supplier can make replenishment decisions according to operating needs and also highlighting of trends in demand. The firm will gain benefit from lower cycle stocks, not just low end–of-month inventories intended to increase firm performance. VMI also helps to make the administration of the delivery process more efficient.

VMI practices enables manufactures or distributors to eliminate the need for customers to reorder, reduce or exclude inventory and obviate stock outs. It relieves the customer of much of the expense of ordering, shipping the materials, counting inventory and stocking low-value items. By passing these costs normally managed by the customer on the supplier, the customer is able to reduce the overall cost of product and increase on margins (Rajagopalan, et al., 2007). There's also reduced lead times with enhanced sales and a reduction of lost sales due to stock outs (Irungu & Wanjau, 2011).

2.3.4 Influence of Forecasting and Replenishment on Financial Performance

Forecasting is a central piece of the operations of a modern firm. It is a decision making tool which considers different factors and justifies decisions. The main idea is to make the prediction and estimations of the future demand and consequently determinate the potential markets for the product or services for the following period (Sundberg, 2009). It is important to understand what happens in the environment as well as know about the company's own activities (Sundberg, 2009). A demand forecast states the needed inventory that helps to overcome the fluctuations in demand. According to the information, a firm can start to plan its upcoming activities in a way that they can most efficiently transform their inputs into outputs.

Additionally, a forecasting enables a corporation to provide its customer higher value. It distributes the operations the information including the needed products and stock keeping units (SKU), their quantities and the facilities required to fulfill the future needs. This way, the firm can gain better profit as forecast offers them a chance to lower their costs. According to Sundberg (2009) forecasting creates a data bank that helps decision makers

settle targets, create plans and demonstrate the changes in environment. Moreover, it guides a firm to act in the best possible way to increase the efficiency without decreasing the service value offered to the customers (Plinere & Borisov, 2015).

According to Hennel (2016) manufacturers may not be able to predict the future with 100% accuracy, but they need to get as close to perfect as possible if they want to ensure the right amount of inventory and production rates at all times. Manufacturers can use planning applications and statistical forecasting engines that leverage all of their operational data to better accommodate seasonal demand, product hierarchies, product promotions, slow-moving items, causal variables and outliers.

Replenishment also known as reordering is filling again by supplying what has been used up. Chandrika (2015) established that (inventory) replenishment is an operation that consists in making the stock full again in order to avoid stock-out. Replenishment is typically initiated by a backorder passed to a supplier or to a manufacturer. According to Sundberg (2009) replenishment is the movement of inventory from upstream or reserve product storage locations to downstream or primary storage, picking and shipment locations. Min, Zhou, Liu and Wang (2012) stated that some of the replenishment challenges for manufacturing industries may include variability of supplier lead times, maintenance of safety stock, maximum/minimum order level quantities, excess stock level, stock outs and stock obsolescence. These can be countered by replenishment tactics to increase profits and performance. They include; know when to order more inventories; know exactly how much inventory to order and monitor and measure vendor performance: use multi-location inventory redistribution.

The purpose of replenishment is to keep inventory flowing through the supply chain by maintaining efficient order and line item fill rates. The process helps prevent costly inventory overstocking. Sehgal (2008) stated that the steps to be followed in the process include defining the review period for reordering and an ordering quantity. Next are the inventory parameters to determine whether an order for replenishment should be placed at the time of review or not. Reviews either be continuous (done continuously as soon as stocks fall below a predetermined level) or periodic (done when stocks fall below at a

predetermined level at a certain set frequency). Based on how the review period and order quantities are defined, there are a few options to drive the reordering.

Automation of replenishment is also getting very popular to manufacturers. Chandrika (2015) identified that in order to increase productivity; most inventory management systems implement replenishment rules to automate operations to some extent. Replenishment is typically triggered when the inventory level hits the reorder point also known as reorder trigger level, a setting from the system. Chandrika (2015) further added that forecasts are implicitly defined through replenishment rules. Indeed, defining a reorder point is roughly equivalent to producing a demand forecast. From the reorder point it is possible to some extent to compute the underlying implicit demand forecast. Forecasting comes into play within the replenishment rules.

2.3.5 Inventory Management and Financial Performance

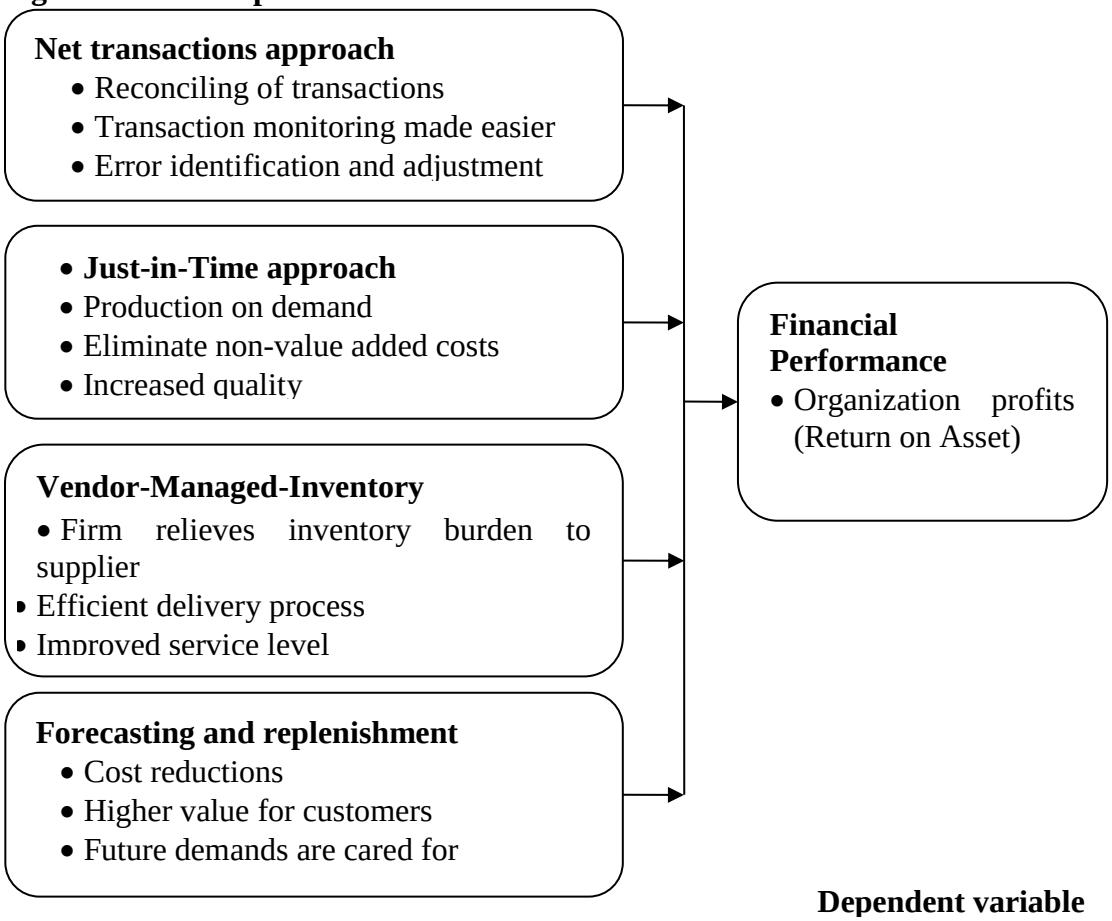
Singhal (2005) studied the effect of excess inventory on long term organizational performance. Singhal found evidence suggesting that stock market partially anticipates excess inventory situations and that firm do not recover quickly from negative effects of excess inventory. He further noted that the negative effect of excess inventory is economically and statistically significant. Agus and Noor (2006) examined the relationship between inventory management practices and financial performance. The study measured the manager's perceptions of inventory and supply chain management practices and the level of performance in the industry. The findings suggest that inventory management practices have significant correlations with profitability and return on sales (ROS) which enormously contribute to organizational performance.

Augustine, Trenkel, Wood and Lorance (2013) reports on investigation of the impact of proper inventory management on organizational performances. The study suggests a link between inventory management and productivity and concludes that highly positive correction between good inventory management and organizational cost reduction. However, he noted that management should closely monitor and manipulate inventory system to maintain production consistency for organizational productivity.

Eckert (2007) examined inventory management and role it plays in improving customer satisfaction. He found a positive relationship between customer satisfaction and supplier partnerships. Koumanakos (2008) studied the effect of inventory management on firm performance. The findings suggested that the higher the level of inventories preserved by a firm, the lower the rate of return. Despite all these studies that have been done, little attempt has been made to find out about the impact of inventory management practices on a firm's financial performance. This study therefore sought to investigate the impact of inventory

2.4 Conceptual framework

Figure 2. 1: Conceptual Framework



Source: Author (2016)

2.5 Hypothesis of the study

H_{01}: Net transactions approach as an inventory management practice has a significant effect on performance of manufacturing firms in Kenya.

H_{02}: Just-in-Time (JIT) purchasing policy as an inventory management practice has a significant effect on performance of manufacturing firms in Kenya.

H_{03}: Vendor Managed Inventory (VMI) as an inventory management practice has a significant effect on performance of manufacturing firms in Kenya.

H_{04}: Forecasting and replenishment as inventory management practices have a significant effect on performance of manufacturing firms in Kenya.

2.6 Operationalization

Table 2.1: Operationalization

Objective	Variable Type	Indicators	Type of data analysis
To determine the effects of net transactions approach to inventory management on performance of manufacturing firms in Kenya.	Independent	• Reconciling of transactions • Transaction monitoring made easier • Error identification and adjustment	Ordinal Nominal Regression
To establish the effects of the Just in Time (JIT) purchasing policy on performance of manufacturing firms in Kenya.	Independent	• Production on demand • Eliminate non-value added costs • Increased quality	Ordinal Nominal Regression
To establish the effects of vendor managed inventory on performance of manufacturing firms in Kenya	Independent	• Firm relieves inventory burden to supplier • Efficient delivery process • Improved service level	Ordinal Nominal Regression
To determine the influence of forecasting and replenishment on performance of manufacturing firms in Kenya	Independent	• Cost reductions • Higher value for customers • Future demands are cared for	Ordinal Nominal Regression
Financial Performance	Dependent	• Organization profits (Return on Assets)	Ordinal Nominal Regression

2.7 Summary

Chapter two looked at the theoretical framework of the study and the empirical literature covering the four independent variables (net the transactions approach, Just-in-Time, Vendor Managed Inventory and Forecasting & Replenishment). It also covered the conceptual framework, hypothesis and operationalization of the study.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the researcher discussed the intended research design, target population, sampling technique and sampling size, data collection, data analysis and the ethical considerations for the study.

3.2 Research Design

The study adopted a descriptive survey design and focused on manufacturing firms in Kenya. A descriptive research design determines and reports the way things are (Mugenda & Mugenda, 2003). Maxwell (2012) observed that a descriptive research design is used when data is collected to describe persons, organizations, settings or phenomena. The design also has enough provision for protection of bias and maximized reliability (Creswell, 2012).

Descriptive research design was used because it appropriately enabled the researcher to describe how inventory management practices affected financial performance of manufacturing firms in Kenya using a case of agro-chemical firms. In this, the specific objective of the study would have been achieved. The design also helped the researcher to collect quantitative data that was analyzed to establish relationship between inventory management practices and financial performance of manufacturing firms in Kenya using a case of agro-chemical firms.

3.3 Target Population

The target population is a group of elements to which the researcher wants to make inference to make conclusion on characteristic of the whole population (Mugenda & Mugenda, 2003). The target population of this study was 65 Agro-chemicals in Kenya. The respondents included operation managers, procurement managers, procurement officers and stores managers

Table 3.1: Target Population

Target Group	Target Population
Procurement managers	130
Operation managers	130
Stores managers	65
Total	**325**

3.4 Sample Size and Sampling procedures

Sampling technique involve the procedures applied to get the representative sample from the target population (Mugenda & Mugenda, 2003). The study adapted purposive sampling technique. In purposive sampling the person who is selecting the sample tries to make the sample representative, depending on his opinion or purpose of the study (Barreiro & Albandoz, 2001). This study employed a survey of all the 65 existing firms. The study will target the procurement managers, operations managers and stores managers at the agro-chemical firms. 30% of the target population was sampled to get 98 respondents for the study.

Table 3. 2: Sample Size

Target Group	Target Population	Proportion of population	Sample Size
Procurement managers	130	30%	39
Operation managers	130	30%	39
Stores managers	65	30%	20
Total	**325**		**98**

3.5 Instrumentation

The study collected data from the respondents by the use of the questionnaire. The questionnaire was structured and divided into sections covering each of the objectives of the study. According to Nichols, Mitchell, Nichols, Chalmers and Begley (2013) they observed that, a questionnaire is simply a tool for collecting and recording information about a particular issue of interest to an individual. It is mainly made up of a list of questions, having clear instructions and space for answering the questions. The structured questions were used in an effort to conserve time and to facilitate easier analysis as they are in immediate usable form. This would help in easy data analysis.

3.5.1 Validity and Reliability of Instruments

Validity is the accuracy and meaningfulness of inferences based on the research results. It is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. Kothari (2004) states that validity indicates the degree to which an instrument measures what it is supposed to measure, that is the extent to which differences found with a measuring instrument reflect true differences among those being tested. To enhance validity of the instruments, the questionnaire was reviewed by the supervisor to find out whether the questions achieved the research objectives and answer the research questions.

According to O'Connor and Kleyner (2011) reliability is defined as a measure of how consistent a research method is. A pilot study was conducted which allowed for pre-testing of the research instruments for reliability. 10 respondents were used to test the validity and reliability of the research instrument –the question; they were in the light industries of the manufacturing sector. After pre-testing the questionnaire any inconsistencies in the instrument are corrected.

3.6 Data Collection Procedure

Questionnaires were administered to the respondents at the agro-chemical firms and the researcher applied the ‘drop and pick later' technique since they are expected to be busy and the researcher gave them one week to fill the questionnaire before coming to collect it. The researcher did follow up by telephone.

3.7 Diagnostic Tests

The study used the F Statistic to determine the validity of the regression model adopted. This statistic was compared to the F Critical value where the regression model would be referred to as valid if F Statistic is greater than F Critical. Otherwise, the conclusion made will be that the model is invalid. This was based from the results in ANOVA Table.

3.8 Data Analysis and Presentation

Before the collected data is processed, data preparation was done on the completed questionnaires by editing, coding, entering and cleaning the data. This would help in checking for completion and accuracy of the responses. Data was analyzed using

descriptive statistics and multiple regression analysis with the help of SPSS and MS EXCEL.

Regression analysis was used to test for the relationship between the independent variable (Net transactions approach; Just-in-Time approach; Vendor-Managed-Inventory and Forecasting and replenishment) and the dependent variable (Performance)

The multiple regression model was as follows:

$Y= a_1 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where Y= Performance

a_1 = Constant

β_1, β_2, β_3 and β_4 are Coefficients of the determinants of the relationship between inventory management practices and performance of manufacturing firms in Kenya using a case of agro-chemical firms

ε = error term

X_1= Net transactions approach

X_2= Just-in-Time approach

X_3= Vendor-Managed-Inventory

X_4 = Forecasting and replenishment

The findings from the analysis were presented in charts, pie charts, figures, graphs and tables.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presented results of data analysis from the collected data from the field, presentation as well as interpretation of findings. The purpose of the study was to analyse the relationship between inventory management practices and financial performance of manufacturing firms in Kenya: case of Agrochemical firms. The research data was collected using a questionnaire. Data was analyzed using SPSS version 22.0. The presentation of research findings was be carried out by use of frequency tables.

4.1.1 Response Rate

The target population of this study was the 65 Agro-chemicals in Kenya. Out of the 325 questionnaires distributed, a total of 247 filled questionnaires were collected by the researcher and used for analysis. This translated to a response rate of 76%. The response rate conforms to stipulations by Mugenda (1999), that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and above is excellent for analysis. The response rate is as illustrated in Table 4.1

Table 4. 1: Response Rate

Response Rate	Frequency	Percentage
Response	247	76
Non Response	78	24
Total	**325**	**100**

4.2 General Information

General information about the respondents was collected during the study and this section sought to present the demographics of the respondents relevant to this study. This includes their gender, level of education, years worked at the Agro-chemicals manufacturing industry in Kenya and position held at the company.

4.2.1 Gender of the Respondents

The study sought to establish the number of men and women working at Agrochemical Firms. The findings of the study are as indicated in Table 4.2

Table 4. 2: Gender of Respondents

Gender	Frequency	Percentage
Male	133	53.8
Female	114	46.2
Total	**247**	**100.0**

From Table 4.2, the study found that 53.8% of the respondents were male and 46.2% were female. The finding indicates that males form the largest number of workers at Agrochemical Firms in comparison to females. Therefore, measures should be put in place to attract more female workers.

4.2.2 Level of Education

The highest level of education attained by the respondents was also sought by the study. The findings are presented in Table 4.3

Table 4. 3: Level of Education

Level of Education	Frequency	Percent
Certificate	26	10.5
Diploma	60	24.3
Degree	132	53.4
Masters	27	10.9
PhD	2	.8
Total	**247**	**100.0**

The findings from Table 4.2 show that majority of the respondents had obtained a degree as shown by 53.4%, 24.3% of the respondents had a diploma, 10.9% of the respondents had a Masters Degree, certificate holders composed of 10.5% of the respondents while only 0.8% of the respondents had a PhD.

4.2.3 Number of Years Worked

The study sought to determine the number of years the respondents had worked at Agrochemical Firms. The findings are shown in Table 4.4

Table 4. 4: Number of Years Worked

The study established that majority of the workers had worked between 3-6 years as shown

Number of years worked	Frequency	Percent
1-3 years	58	23.5
3-6 years	121	49.0
6-9 years	56	22.7
Above 10 years	12	4.9
Total	**247**	**100.0**

with 49%, 22.7% of the respondents had worked between 6-9 years at 22.7%, 23.5% of the respondents had worked between 1-3 years and 4.9% has worked for more than 10 years at 4.9%. Therefore were aware of inventory management practices and financial performance of manufacturing firms.

4.2.3 Position Held at the Company

The study sought to determine the positions of the respondents in Agrochemical Firms. The findings are shown in Table 4.4

Table 4. 5: Position Held

Position Held	Frequency	Percentage
Procurement managers	70	28.3
Operations Manager	86	34.8
Stores Managers	91	36.8
Total	**247**	**100.0**

The findings indicate that 36.8% of the respondents are store managers, 34.8% of the respondents are operations managers 34.8% and 28.3% are procurement managers. The findings indicate that the study involved participants from across all the fields.

4.3 Effects of Net Transactions Approach on Financial Performance

Several statements net transactions approach and its effect on inventory management were asked and respondents required to rate the extent of agreement with the following statement on its applicability in agrochemical firms. Using the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree. The findings are as shown in Table 4.6

Table 4. 6: Effects of Net Transactions Approach on Financial Performance

Effects of Net Transactions Approach on Financial Performance	Mean	Std. Dev
Net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance	4.1336	.60011
Net transactions is a transaction-driven system which leads to higher performance	4.4615	.50760
The ability to re-plan improves performance of agrochemical firms	3.3482	.65660
Netting all inventory transactions helps firms to identify transaction errors thus high performance is guaranteed	3.768	.7871
Orders are not erased and in case of changes, the inventory can be rebalanced leading to high performance	4.0732	.81986
transactions ensures that the actual and recorded inventory amounts are the same improving performance	3.9838	1.05525
Uncover irregularities ensuring high performance of the agrochemical firm.	3.5870	1.03177
Ensures transactions are recorded correctly leading to high performance	4.0243	1.14383
Managing inventory transactions leads to high performance through achieving organizational goals	3.7368	.70967
Extent does net transactions approach affect the inventory management performance	4.0243	1.14383

The respondents agreed that net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance with mean of 4.1336 and std. deviation of 0.60011. On whether a Net transaction is a transaction-driven system which leads to higher performance the respondents agreed with a mean of 4.4615 and std. deviation of 0.50760. On whether the ability to re-plan improves performance of agrochemical firms the respondents neither agreed nor disagreed had a mean of 3.3482 and standard deviation of 0.65660.

Netting all inventory transactions helps firms to identify transaction errors thus high performance is guaranteed had a mean of 3.768 and standard deviation of .7871. Orders are not erased and in case of changes, the inventory can be rebalanced leading to high performance had a mean of 4.0732 and standard deviation of .8198. Transactions ensure that the actual and recorded inventory amounts are the same improving performance had a mean of 3.9838 and standard deviation of 1.05525. Uncover irregularities ensuring high

performance of the agrochemical firm had a mean of 3.5870 and standard deviation of 1.03177. Ensures transactions are recorded correctly leading to high performance with mean of 4.0243 and standard deviation of 1.14383. Managing inventory transactions leads to high performance through achieving organizational goals had a mean of 3.7368 and standard deviation of .70967. The Extent net transactions approach affects the inventory management performance had a mean of 4.0405 and standard deviation of 1.12906.

These findings concur with that of Reinhard (2015) netting all available inventory transactions helps firms to identify transaction errors, uncover irregularities, provides added comfort that the transactions are recorded correctly and also assists in monitoring all the transactions of a business.

4.4 Effects of Just in Time (JIT) Purchasing Policy on Financial Performance

Several statements on Just in Time (JIT) purchasing policy and its effect on inventory management performance were asked and the Rate the extent of agreement with the following statement. Use the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree. The results are shown in Table 4.7

Table 4. 7: Just In Time (JIT) Purchasing Policy and Financial Performance

Statements on Just In Time (JIT) Purchasing Policy	Mean	Std. Dev
Enables companies to produce products in required amounts and just when demanded.	3.6154	.82260
Implementation of JIT in a company leads to cost reductions	3.4089	.84992
JIT reduces inventory leading to higher productivity	3.5385	.75273
Maximizes customer satisfaction by increasing quality of products at the agrochemical firms	3.6073	.76750
Increases flexibility in production	3.6356	.74136
Manufacturing system is a tool that our agrochemical firms use to enhance competitive advantage.	3.8381	.99495
Basic premise of JIT is having just the right amount of inventory	3.5668	.83288
Pull method is used whereby goods are produced in each manufacturing stage only as they are needed	3.4534	.77358
Uses performance measures based on lead-time reduction to enhance its productivity	3.5061	.82576
Our firm uses set-up reduction measures for performance	3.5547	.79381
Performance measures is based increased quality	3.5506	.74112
Our firm effects it by releasing held-up funds, space and time	3.6397	.72955
Extent that just in time (JIT) purchasing policy affect inventory management performance	3.6842	.70816

The study established that JIT enables companies to produce products in required amounts and just when demanded with a mean of 3.6154 and std. deviation of 0.82260. Implementation of JIT in a company leads to cost reductions in the production system had a mean of 3.4089 and standard deviation of 0.84992. The study found that JIT reduces inventory leading to higher productivity in the agrochemical firms with a mean of 3.5385 and standard deviation of 0.75273. Maximizes Customer Satisfaction by increasing quality of products at the Agrochemical Firms had a mean of 3.6073 and standard deviation of 0.76750.

The respondents agreed that increases flexibility in production thus improving the performance of the agrochemical firm had a mean of 3.6356 and standard deviation of .74136. Manufacturing System is a tool that our agrochemical firm use to enhance competitive advantage had a mean of 3.8826 and standard deviation of 0.83288. Basic Premise of JIT is having just the right amount of inventory i.e. raw materials or finished goods had a mean of 3.5668 and standard deviation of 0.83288.

Pull method is used whereby goods are produced in each manufacturing stage only as they are needed had a mean of 3.4534 and standard deviation of 0.77358. Uses performance measures based on lead-time reduction to enhance its productivity had a mean of 3.5061 and standard deviation of 0.82576. Firm uses set-up reduction measures for performance had a mean of 3.5547 and standard deviation of 0.79381. A performance measure in our agrochemical firm is based increased quality 3.5506 and standard deviation of 0.74112. Our firm affects it by releasing held-up funds, space and time leading to increased output had a mean of 3.6397 and standard deviation of 0.72955. The extent to which just in time (JIT) purchasing policy affect inventory management performance was found to have a mean of 3.6842 and standard deviation of 0.70816.

The findings are in agreement with that of Kamakia (2015) who noted that Companies' effectively implementing JIT principles have substantial competitive advantages over competitors that have not. The trick is figuring out how to apply JIT principles to gain competitive advantages in your specific industry and business situation.

4.5 Effects of Vendor Managed Inventory (VMI) on Financial Performance

Several statements vendor managed inventory (VMI) and its effect on performance of inventory management. Rate of extent of respondent's agreement to the statement using the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree. The findings were shown in Table 4.8

Table 4. 8: Vendor Managed Inventory (VMI) on Financial Performance

Vendor Managed Inventory (VMI) on Financial Performance	Mean	Std. Dev
Vendor management optimizes supply chain leading to high performance	3.9960	.72973
Suppliers have access to customer's inventory data	3.8300	.76737
The supplier monitors agrochemical firm's inventory level for re-supply aiming at improving performance	3.6073	.84321
Decisions on re-supply are made on behalf of the agrochemical firm to improve its production lead time	3.6194	.78146
The supplier determines the maximum or minimum limits of inventory that should be at the firm's site for effective performance	3.9150	.89537
VMI is guided by a contracts that guide the inventory of the agrochemical firm aimed at improving its performance	3.6559	.97478
VMI clears inventory constraints to meet performance target and expectations.	3.5466	.79433
Implementing VMI enable customer reduce high stocks	3.6680	.81843
Financial terms are clearly stated in contracts to enhance productivity of the agrochemical firm	3.6073	.75683
Implementing VMI leads to high variability of incoming order from the customer	3.5749	.89344
VMI practices enables manufactures to reduce or exclude inventory leading to higher performance	3.3927	.72389
VMI practices enables agrochemical firms to obviate stock outs hence higher productivity	3.4858	.79044

what extent does vendor managed inventory (VMI) influence the performance of inventory management	3.5425	.76324

From Table 4.8, Vendor management at agrochemical firm optimizes supply chain leading to high performance had a mean of 3.9960 and standard deviation of 0.72973. The supplier determines the maximum or minimum limits of inventory that should be at the firm's site for effective performance had a mean of 3.8300 and standard deviation of 0.76737. The supplier monitors agrochemical firm's inventory level for re-supply aiming at improving performance had a mean of 3.6073 and standard deviation of 0.84321. Decisions on re-supply are made on behalf of the agrochemical firm to improve its production lead time had a mean of 3.6194 and standard deviation of 0.78146. The supplier determines the maximum or minimum limits of inventory that should be at the firm's site for effective performance and had a mean of 3.9150 and standard deviation of 0.89537.

VMI is guided by a contract that guide the inventory of the agrochemical firm aimed at improving its performance had a mean of 3.6559 and standard deviation of 0.97478. VMI clears inventory constraints to meet performance target and expectations had a mean of 3.5466 and standard deviation of 0.79433. Implementing VMI will enable customer reduce high stocks leading to higher performance with better production levels had a mean of 3.6680 and standard deviation of 0.81843. The Financial terms are clearly stated in contracts to enhance productivity of the agrochemical firm and had a mean of 3.6073 and standard deviation of 0.75683. Implementing VMI leads to high variability of incoming order from the customer had a mean of 3.5749 and standard deviation of 0.89344.

VMI practices enables manufactures to reduce or exclude inventory leading to higher performance had a mean of 3.3927 and standard deviation of 0.72389. VMI practices enable agrochemical firms to obviate stock outs hence higher productivity had a mean of 3.4858 and standard deviation of 0.79044. It was found that vendor managed inventory (VMI) influence the performance of inventory management with a mean of 3.5425 and standard deviation of 0.76324.

The findings are in agreement with those of (Rajagopalan et al., 2007) VMI practices enables manufactures or distributors to eliminate the need for customers to reorder, reduce

or exclude inventory and obviate stock outs. It relieves the customer of much of the expense of ordering, shipping the materials, counting inventory and stocking low-value items

4.6 Influence of Forecasting and Replenishment on Financial Performance

Several statements on forecasting and replenishment and how it impacts the performance of inventory management were asked. Rate of extent of respondent's agreement with the following statement using the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree. The findings are as indicated in Table 4.9

Table 4. 9: Influence of Forecasting and Replenishment on Financial Performance

Influence of Forecasting and Replenishment on Financial Performance	Mean	Std. Dev
Forecasting makes prediction of the future demand ensuring performance is high in our agrochemical firm	3.4130	.84555
Forecasting estimates markets for agrochemical firm products so that performance is enhanced	3.5709	.75037
A demand forecast states the needed inventory that helps to overcome the fluctuations in demand for our firm	3.4656	.76365
Forecasting enables our firm to provide its customer higher value by increasing our efficiency	3.5263	.70877
Forecasting creates a data bank that helps decision makers in our firm to create plans to meet targets through improve performance	3.5587	.77800
Forecasting demonstrates the changes in environment to improve performance in our firm	3.8259	.78996
Use of statistical forecasting engines by our firm helps it make predictions while improve firms' performance	3.6113	.87580
Our firm uses inventory replenishment in operation to enhance our performance	3.5425	.77905
Frequent replenishment at our agrochemical firm reduces stock obsolescence hence improves performance	3.5182	.75350
Our agrochemical firm maintains efficient order to improve organizational performance	3.4656	.79495
Our firm uses automation in replenishment process to increase our productivity	3.5506	.73561
what extent does forecasting and replenishment influence the inventory management performance	3.5304	.75310

From table 4.9, it was agreed that Forecasting makes prediction of the future demand ensuring performance is high in our agrochemical firm with a mean of 3.4130 and standard deviation of 0.84555. Forecasting estimates markets for agrochemical firm products so that performance is enhanced had a mean of 3.5709 and standard deviation of 0.75037.

A demand forecast states the needed inventory that helps to overcome the fluctuations in demand for our firm had a mean of 3.4656 and standard deviation of 0. 76365. Forecasting enables our firm to provide its customer higher value by increasing our efficiency had a mean of 3.5263 and standard deviation of 0.70877. Forecasting creates a data bank that helps decision makers in our firm to create plans to meet targets through improve performance had a mean of 3.4656 and standard deviation of 0.76365.

Forecasting demonstrates the changes in environment to improve performance in our firm had a mean of 3.5263 and standard deviation of 0.70877. Forecasting enables our firm to provide its customer higher value by increasing our efficiency had a mean of 3.5263 and standard deviation of 0.70877. Forecasting creates a data bank that helps decision makers in our firm to create plans to meet targets through improve performance had a mean of 3.5587 and standard deviation of 0.77800. Forecasting demonstrates the changes in environment to improve performance in our firm had a mean of 3.8259 and standard deviation of 0.78996.

Use of statistical forecasting engines by our firm helps it make predictions while improve firms' performance had a mean of 3.6113 and standard deviation of 0.87580. Our firm uses inventory replenishment in operation to enhance our performance had a mean of 3.5425 and standard deviation of 0.77905. Frequent replenishment at our agrochemical firm reduces stock obsolescence hence improves performance had a mean of 3.5182 and standard deviation of 0.75350. The agrochemical firm maintains efficient order to improve organizational performance had a mean of 3.4656 and standard deviation of 0.79495. The firm use automation in replenishment process to increase our productivity had a mean of 3.5506 and standard deviation of 0.73561. The extent forecasting and replenishment influence the inventory management performance was found to have a mean of 3.5304 and standard deviation of 0.75310.

The results concur with Sehgal (2008) who stated that the steps to be followed in the process include defining the review period for reordering and an ordering quantity. Forecasting creates a data bank that helps decision makers settle targets, create plans and demonstrate the changes in environment.

4.7 Effects of Financial Performance

Several statements on the financial performance of inventory management were formulated. Rate of extent of respondent's agreement with the following statement using the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree. The findings are as indicated in Table 4.10

Table 4. 10: Effects of Financial Performance

Effects of Financial Performance	Mean	Std. Dev
ROE has improved due to inventory management	3.5466	.73588
Inventory management improves ROA	3.5182	.76421
After implementing inventory management practices profits have increased	3.6316	.71985
Growth in sales has improved due to inventory management	3.6235	.75972
The performance of the business has improved	3.8907	.79646

The findings from Table 4.9 indicate that ROE had improved due to inventory management had a mean of 3.5466 and standard deviation of 0.73588. Inventory management improved ROA with a mean of 3.5182 and standard deviation of 0.76421. After implementing inventory management practices profits have increased with a mean of 3.6316 and standard deviation of 0.71985. Growth in sales has improved due to inventory management had a mean of 3.6235 and standard deviation of 0.75972. Performance business had improved with a mean of 3.8907 and standard deviation of 0.79646.

The study is in agreement with that of Augustine, Trenkel, Wood & Lorance (2013) re the impact of proper inventory management on organizational performances. The study suggests a link between inventory management and productivity and concludes that highly positive correction between good inventory management and organizational cost reduction. However, management should closely monitor and manipulate inventory system to maintain production consistency for organizational productivity.

4.8 Diagnostic Tests

Before conducting regression analysis, the researcher carried out diagnostic tests to test the suitability of the dataset for regressing. The specific tests conducted in this context included; multicollinearity and normality. VIF was used to test for Multicollinearity, Skewness and Kurtosis tested Normality.

4.8.1 Multicollinearity Test

Variance of Inflation Factor VIF was used to test for Multicollinearity. The findings are indicated in Table 4.11.

Table 4. 11: Multicollinearity Test

	Collinearity Statistics	
	Tolerance	**VIF**
Net transactions	.996	1.004
Just in time	.933	1.072
Vendor-Managed-Inventory	.918	1.090
Forecasting and replenishment	.969	1.032

As indicated in Table 4.11, Net transaction approach had VIF of 1.004; Just-in-Time had 1.072, Vendor Managed Inventory had 1.090 and Forecasting and replenishment had 1.032. As VIF lies between 1 and 10, this shows that there was no Multicollinearity in the dataset.

4.8.2 Normality Test

Normality Test was done using Skewness and Kurtosis. The findings are indicated in Table 4.12.

Table 4.12: Normality Test

	N	Maximum	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Financial performance	247	25.00	-.185	.155	.877	.309
Net transactions	246	47.00	-.661	.155	.399	.309
Just in time	247	60.00	.034	.155	1.045	.309
Vendor-Managed-Inventory	247	65.00	.280	.155	.157	.309
Forecasting and replenishment	247	53.00	.339	.155	.191	.309

From Table 4.12, financial performance had skewness of -0.185 and Kurtosis of 0.877, Net transaction approach had -0.661 and 0.399, Just-in-Time had 0.034 and 1.045, Vendor Managed Inventory had 0.280 and 0.157 while Forecasting and replenishment had 0.339 and 0.191 as Skewness and Kurtosis respectively. According to Kothari (2004) data analysis proceeds if Kurtosis and Skewness are not greater than +/-2. In this context, the data set was normally distributed and therefore suitable to regress.

4.9 Regression Analysis

A multiple linear regression analysis was conducted to investigate on the relationship between the independent variables and customer satisfaction. The coefficient of determination (R-Square) resulting from the linear regression was used to determine the goodness of fit and R-square greater than 0.7 indicated a very good fit. P-values for the t-test statistics were used to determine the significance of the independent variables in the regression model. The findings are presented in subsequent sections.

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.340[a]	.116	.101	2.38171

The findings of the model summary indicate that the value of R is 0.116 R square is 0.116 and adjusted R square is 0.101. The findings indicate that 11.6% change in financial performance is accounted for by the independent variable. The rest percent is explained by the variables in the error term.

Table 4.14: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	178.996	4	44.749	7.889	.000[b]
Residual	1367.085	241	5.673		
Total	1546.081	245			

The ANOVA results at 5% level of significance indicate that F calculated is 7.889 while F critical is 2.4091. Since F calculated is greater than F Critical (7.889 > 2.4091), this indicates that the overall model was significant.

Table 4.15: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	11.167	2.660		4.198	.000
Net transactions	-.002	.044	-.003	-.052	.958
Just in time	-.028	.029	-.060	-.958	.339
Vendor-Managed-Inventory	.018	.034	.034	.530	.596
Forecasting and replenishment	.194	.036	.335	5.444	.000

The resultant equation becomes:

$Y= 11.167 -0.002X_1- 0.028X_2 + 0.018X_3 + 0.194\ X_4 + \varepsilon$ Where: X_1= Net transactions approach, X_2= Just-in-Time approach, X_3= Vendor-Managed-Inventory and X4 = Forecasting and replenishment.

Therefore, when are held constant, performance would be at 11.167, a unit decrease in net transactions approach would increase financial performance by 0.02, a unit decrease in JIT holding other variable constant would decrease financial performance of agrochemical firms by 0.028, a unit decrease in vendor managed inventor holding other variables constant would increase financial performance by 0.018 and a unit increase in forecasting

and replenishment holding other variables constant would increase performance of agrochemical firms by 0.194. The P- value of forecasting and replenishment 0.010 is less than 0.05 and therefore there is statistically significant association with performance of the Agrochemical firms. From the findings we therefore accept the hypothesis that Forecasting and replenishment as inventory management practices have an effect on performance of manufacturing firms in Kenya.

Based on the findings, study rejects hypotheses; **H_{01}, H_{02}** and **H_{03}** and accepts hypothesis **H_{04}** that forecasting and replenishment as inventory management practices have a significant effect on performance of manufacturing firms in Kenya. According to Chandrika (2015), in order to increase productivity; most inventory management systems implement replenishment rules to automate operations to some extent.

It was surprising to note that net transactions approach, Just-in-Time (JIT) purchasing policy and Vendor Managed Inventory (VMI) all had no significant effect on performance of manufacturing firms. These findings contradicts with Dalci and Tanis (2006) who explained that JIT aims at minimizing work-in-progress and finished goods inventory, reducing lead time and increasing product quality. The findings further contradicts with Kaipia, Holmstrom and Tanskanen (2002) who demonstrated that VMI has enabled a substantial inventory reduction as well as changing production style from make to stock to make to order production.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the results of the analyzed data on each variable of the study. The chapter further presents the conclusion of the study in line with the objectives. The chapter also presents recommendations of the study based on the findings of the analyzed data. There is also a recommendation for further research that opens an opportunity for future scholars and researcher to add more knowledge.

5.2 Summary of the Findings

This subsection presents a brief summary of the research findings on each variable of the study.

5.2.1 Net Transactions Approach and Financial Performance

The respondents agreed that net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance. On whether a Net transaction is a transaction-driven system which leads to higher performance the respondents agreed .The ability to re-plan improves performance of agrochemical firms the respondents neither agreed nor disagreed .Netting all inventory transactions helps firms to identify transaction errors thus high performance is guaranteed. Orders are not erased and in case of changes, the inventory can be rebalanced leading to high performance.

Transactions ensured that the actual and recorded inventory amounts are the same improving performance. The study found that the firms uncover irregularities ensuring high performance of the agrochemical firm. The firms also ensured transactions are recorded correctly leading to high performance. Managing inventory transactions leads to high performance through achieving organizational goals. The net transactions approach affects the inventory management performance to a moderate extent

5.2.2 Just in Time Purchasing Policy and Financial Performance

The study established that JIT enables companies to produce products in required amounts and just when demanded. Implementation of JIT in a company leads to cost reductions in the production system .The study found that JIT reduces inventory leading to higher productivity in the agrochemical firms. JIT maximizes Customer Satisfaction by increasing quality of products at the Agrochemical Firms. The respondents agreed that increases flexibility in production thus improving the performance of the agrochemical firms. Manufacturing System is a tool that agrochemical firms use to enhance competitive advantage. Basic Premise of JIT is having just the right amount of inventory i.e. raw materials or finished goods.

Pull method is used whereby goods are produced in each manufacturing stage only as they are needed. The firms use performance measures based on lead-time reduction to enhance its productivity. Firms use set-up reduction measures for performance had a performance measure in our agrochemical firm is based increased quality. The findings showed that the firm affects it by releasing held-up funds, space and time leading to increased output. The just in time (JIT) purchasing policy affect inventory management performance to a moderate extent.

5.2.3 Vendor Managed Inventory (VMI) and Financial Performance

Vendor management at agrochemical firm optimizes supply chain leading to high performance and suppliers determine the maximum or minimum limits of inventory that should be at the firm's site for effective performance. The supplier monitors agrochemical firm's inventory level for re-supply aiming at improving performance. Decisions on re-supply are made on behalf of the agrochemical firm to improve its production lead time. The supplier determines the maximum or minimum limits of inventory that should be at the firm's site for effective performance.

VMI is guided by a contract that guide the inventory of the agrochemical firm aimed at improving its performance it was also found that VMI clears inventory constraints to meet performance target and expectations. Implementing VMI will enable customer reduce high stocks leading to higher performance with better production levels. The Financial terms are

clearly stated in contracts to enhance productivity of the agrochemical firm and implementing VMI leads to high variability of incoming order from the customer. VMI practices enables manufactures to reduce or exclude inventory leading to higher performance and also enable agrochemical firms to obviate stock outs hence higher productivity. It was found that vendor managed inventory (VMI) influence the performance of inventory.

5.2.4 Forecasting, Replenishment and Financial Performance

The findings showed that Forecasting makes prediction of the future demand ensuring performance is high in agrochemical firms. Forecasting estimates markets for agrochemical firm products so that performance is enhanced. A demand forecast states the needed inventory that helps to overcome the fluctuations in demand for our firm. Forecasting enables our firm to provide its customer higher value by increasing our efficiency. It was also established that Forecasting creates a data bank that helps decision makers in firms to create plans to meet targets through improve performance.

Forecasting demonstrates the changes in environment to improve performance in the Agrochemical firms and that forecasting enable the agrochemical firms to provide its customer higher value by increasing our efficiency. Forecasting creates a data bank that helps decision makers in our firm to create plans to meet targets through improve performance. Forecasting demonstrates the changes in environment to improve performance.

Use of statistical forecasting engines by our firm helps it make predictions while improve firms' performance and that firms uses inventory replenishment in operation to enhance performance. Frequent replenishment at agrochemical firm reduces stock obsolescence hence improves performance .The agrochemical firm maintains efficient order to improve organizational performance and the firm use automation in replenishment process to increase our productivity. The forecasting and replenishment influence the inventory management performance to a moderate extent.

5.2.5 Financial Performance

The study revealed that ROE had improved due to inventory management as the mean. Furthermore, after implementing inventory management practices profits have increased. It was also established that the growth in sales has improved due to inventory management Moreover, performance business had improved as indicated.

5.3 Discussions

The study revealed that net transaction is a transaction-driven system which leads to higher performance the respondents agreed with a mean of 4.4615 and standard deviation of 0.50760. Net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance with mean of 4.1336 and std. deviation of 0.60011. The finding is in line with Labadi and Chen (2010) who established that the main concern of netting is planning for all the resources that the organization needs to run its operations and hence improve its performance.

From the findings, manufacturing system is a tool that our agrochemical firm use to enhance competitive advantage had a mean of 3.8826 and standard deviation of 0.83288. The finding concurs with Inman, Sale, Green and Whitten (2011) who held that JIT manufacturing system is one of the tools that can be used to enhance competitive advantage. JIT enables companies to produce products in required amounts and just when demanded with a mean of 3.6154 and std. deviation of 0.82260. The observation was echoed by Dalci and Tanis (2006) that JIT is a system that enables companies to produce products in required amounts and just when demanded.

The findings of the study indicated that Vendor management at agrochemical firm optimizes supply chain leading to high performance had a mean of 3.9960 and standard deviation of 0.72973. According to Shafie (2004), Vendor Managed Inventory (VMI) can be defined as a means of optimizing supply chain performance in which the supplier has access to the customer's inventory data and is responsible for maintaining inventory level required by the customer.

From the findings, forecasting demonstrates the changes in environment to improve performance in our firm had a mean of 3.8259 and standard deviation of 0.78996. According to Sundberg (2009, it is important to understand what happens in the environment as well as know about the company's own activities. Use of statistical forecasting engines by our firm helps it make predictions while improve firms' performance had a mean of 3.6113 and standard deviation of 0.87580. In view of this finding, Sundberg (2009) established that the main idea of forecasting is to make the prediction and estimations of the future demand and consequently determinate the potential markets for the product or services for the following period. Forecasting creates a data bank that helps decision makers in our firm to create plans to meet targets through improve performance had a mean of 3.5587 and standard deviation of 0.77800. This finding is in line with to Sundberg (2009) that forecasting creates a data bank that helps decision makers settle targets, create plans and demonstrate the changes in environment.

5.4 Conclusion

The study concludes that net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance. Net transaction is a transaction-driven system which leads to higher performance. Orders are not erased and in case of changes, the inventory can be rebalanced leading to high performance. Net transactions also ensure transactions are recorded correctly leading to high performance.

The study further concludes that implementation of JIT in a company leads to cost reductions in the production system. JIT also reduces inventory leading to higher productivity in the agrochemical. JIT further increases flexibility in production thus improving the performance of the agrochemical firm. Firm uses set-up reduction measures for performance. JIT affects the firm by releasing held-up funds, space and time leading to increased output.

The study also concludes that VMI is guided by contracts that guide the inventory of the agrochemical firm aimed at improving its performance. VMI practices enables manufactures to reduce or exclude inventory leading to higher performance. VMI practices

enable agrochemical firms to obviate stock outs hence higher productivity. Furthermore, vendor managed inventory (VMI) influence the performance of inventory management.

The study concludes that forecasting makes prediction of the future demand ensuring performance is high in our agrochemical firm. Forecasting estimates markets for agrochemical firm products so that performance is enhanced. A demand forecast states the needed inventory that helps to overcome the fluctuations in demand for our firm. Forecasting enables our firm to provide its customer higher value by increasing our efficiency. Furthermore, agrochemical firm maintains efficient order to improve organizational performance.

The study further concludes that ROE of agrochemical firms had improved due to inventory. Furthermore, after implementing inventory management practices profits have increased. Growth in sales has also improved due to inventory management. Performance business has also improved due to inventory management practices.

5.5 Recommendations for the Study

The top management of all Manufacturing firms in Kenya should strengthen their abilities of re-planning in order to improve performance. The accounting and procurement departments of this agrochemical firms should ensure that the actual and recorded inventory amounts are the same.

The top management of manufacturing firms in Kenya should adopt pull method whereby goods are produced in each manufacturing stage only as they are needed. Just in Time system of production should be adopted among all manufacturing firms in Kenya for cost reductions in their production systems.

Vendor managed inventory systems should be adopted in order to enable manufactures to reduce or exclude inventory leading to higher performance. VMI should also be adopted among manufacturing firms in order to obviate stock outs hence higher productivity.

Forecasting should be geared towards making prediction of the future demand ensuring that performance is high. All manufacturing firms should maintain efficient orders to improve their organizational performance. Demand forecasts in all manufacturing firms in

Kenya should state the needed inventories that help to overcome fluctuations in demands. Forecasting in manufacturing firms should also create data banks that help decision makers to create plans to meet targets through improved performance.

5.6 Recommendations for Further Studies

This study on inventory management practices and financial performance of manufacturing firms in Kenya was conducted in agrochemical industry. The study used primary data that was gathered exclusively using a questionnaire. Future studies ought to be conducted to cover other sectors like technology, insurance and banking. Future studies should also be conducted using both primary and secondary data. There is also need to carry out future studies by review of empirical studies.

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APPENDICES

Appendix I: QUESTIONNAIRE

This is a study on the seeking: **INVENTORY MANAGEMENT PRACTICES AND PERFORMANCE OF MANUFACTURING FIRMS IN KENYA: CASE OF AGROCHEMICAL FIRMS**

Kindly answer all questions by putting a tick (√) in the appropriate bracket

SECTION A: GENERAL INFORMATION

1. What is your gender?

   Male [ ] Female [ ]

2. What is your highest level of education attained?

Certificate	[	]	Diploma	[	]
Bachelor's Degree	[	]	Masters	[	]
PhD	[	]			

3. How long have you been working in the Agro-chemicals in the manufacturing industry in Kenya?

1-3 year	[	]	3-6 years	[	]
6-9 years	[	]	Above 10 years	[	]

4. What is your position in this Agro-chemicals firm?

Procurement Managers	[	]
Operations Manager	[	]
Stores Managers	[	]

SECTION B NET TRANSACTIONS

5. Below are several statements net transactions approach and its effect on inventory management. Rate your extent of agreement with the following statement on its applicability in agrochemical firms. Use the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree.

Statement	1	2	3	4	5

Net transactions approach's main concern is planning for all the resources that the organization needs to run its operations and hence improve its performance					
Net transactions is a transaction-driven system which leads to higher performance					
The ability to re-plan improves performance of agrochemical firms					
Netting all inventory transactions helps firms to identify transaction errors thus high performance is guaranteed					
Orders are not erased and in case of changes, the inventory can be rebalanced leading to high performance					
Netting inventory transactions ensures that the actual and recorded inventory amounts are the same improving performance					
Netting all inventory transactions uncover irregularities ensuring high performance of the agrochemical firm.					
Netting all inventory transactions at our agrochemical firm ensures transactions are recorded correctly leading to high performance					
Netting approach is crucial to managing inventory transactions lea high performance through achieving organizational goals					

6. To what extent does net transactions approach affect the inventory management performance?

Not at all [ ]
Little Extent [ ]
Moderate Extent [ ]
Large Extent [ ]
Very Large Extent [ ]

SECTION C: JUST IN TIME (JIT)

7. Below are several statements on just in time (JIT) purchasing policy and its effect on inventory management performance. Rate your extent of agreement with the following statement. Use the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree.

Statement	1	2	3	4	5
JIT enables companies to produce products in required amounts and just when demanded.					
Implementation of JIT in a company leads to cost reductions in the production system					
JIT reduces inventory leading to higher productivity in the agrochemical firms					

JIT maximizes customer satisfaction by increasing quality of products at the agrochemical firms					
In JIT increases flexibility in production thus improving the performance of the agrochemical firm					
JIT manufacturing system is a tool that our agrochemical firm use to enhance competitive advantage.					
The basic premise of JIT is having just the right amount of inventory i.e. raw materials or finished goods, available to meet the demands of production process and the end customers					
The Pull method is used whereby goods are produced in each manufacturing stage only as they are needed					
Agrochemical firm uses performance measures based on lead-time reduction to enhance its productivity					
Our firm uses set-up reduction measures for performance					
Performance measures in our agrochemical firm is based increased quality					
JIT in our firm effects it by releasing held-up funds, space and time leading to increased output					

8. To what extent does just in time (JIT) purchasing policy affect inventory management performance?

Not at all [ ]
Little Extent [ ]
Moderate Extent [ ]
Large Extent [ ]
Very Large Extent [ ]

SECTION D: VENDOR MANAGED INVENTORY (VMI)

9. Below are several statements vendor managed inventory (VMI) and its effect on performance of inventory management? Rate your extent of agreement with the following statement. Use the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree.

STATEMENT	**1**	**2**	**3**	**4**	**5**
Vendor management at our agrochemical firm optimizes supply chain leading to high performance					
The supplier has access to the customer's inventory data ensuring supply chain is seamless for higher productivity					
The supplier monitors agrochemical firm's inventory level for re-supply aiming at improving performance					
Decisions on re-supply are made on behalf of the agrochemical firm to improve its production lead time					

The supplier determines the maximum or minimum limits of inventory that should be at the firm's site for effective performance					
VMI is guided by a contracts that guide the inventory of the agrochemical firm aimed at improving its performance					
VMI clears inventory constraints to meet performance target and expectations.					
Implementing VMI will enable customer reduce high stocks leading to higher performance with better production levels					
Financial terms are clearly stated in contracts to enhance productivity of the agrochemical firm					
Implementing VMI leads to high variability of incoming order from the customer					
VMI practices enables manufactures to reduce or exclude inventory leading to higher performance					
VMI practices enables agrochemical firms to obviate stock outs hence higher productivity					

10. To what extent does vendor managed inventory (VMI) influence the performance of inventory management?

Not at all [ ]
Little Extent [ ]
Moderate Extent [ ]
Large Extent [ ]
Very Large Extent [ ]

SECTION E: FORECASTING AND REPLENISHMENT

11. Below are several statements on forecasting and replenishment and how it impacts the performance of inventory management. Rate your extent of agreement with the following statement. Use the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree.

Statement	1	2	3	4	5
Forecasting makes prediction of the future demand ensuring performance is high in our agrochemical firm					
Forecasting estimates markets for agrochemical firm products so that performance is enhanced					
A demand forecast states the needed inventory that helps to overcome the fluctuations in demand for our firm					
Forecasting enables our firm to provide its customer higher value by increasing our efficiency					
Forecasting creates a data bank that helps decision makers in our firm to create plans to meet targets through improve performance					

Forecasting demonstrates the changes in environment to improve performance in our firm					
Use of statistical forecasting engines by our firm helps it make predictions while improve firms' performance					
Our firm uses inventory replenishment in operation to enhance our performance					
Frequent replenishment at our agrochemical firm reduces stock obsolescence hence improves performance					
Our agrochemical firm maintains efficient order to improve organizational performance					
Our firm uses automation in replenishment process to increase our productivity					

12. To what extent does forecasting and replenishment influence the inventory management performance?

Not at all [ ]
Little Extent [ ]
Moderate Extent [ ]
Large Extent [ ]
Very Large Extent [ ]

SECTION F: FINANCIAL PERFORMANCE

13. Below are several statements on the financial performance of inventory management. Rate your extent of agreement with the following statement. Use the Likert scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4=Agree and 5=Strongly Agree.

Statement	1	2	3	4	5
ROE has improved due to inventory management					
Inventory management improves ROA					
After implementing inventory management practices profits have increased					
Growth in sales has improved due to inventory management					
The performance of the business has improved					

THE END

Appendix II: Budget

BUDGET ITEM	**AMOUNT**
Data collection from field	
Research assistants wages	4500
Transportation	7000
Lunch	1200
Airtime	400
TOTAL	**13,100**
Data analysis and presentation	
Internet costs and cyber use	5500
Printing and Photocopying	4000
Binding costs	1500
TOTAL	**11,000**
Contingency	3,000
TOTAL	**24,100**

Appendix III: Work Plan

Activity	**Start Time**	**End Time**	**Amount of Time**
Proposal development and approval	Start -May 2016	End -June 2016	2 Months
Proposal Defense	July 2016	Mid-July 2016	2 weeks
Data collection	Mid July 2016	End-August 2016	1½ Months
Data analysis and Report Writing	Start of Sept 2016	Mid-Oct 2016	1½ Months
Project report submission	Mid-Oct 2016	End –Oct 2016	1 Month
Final Defense of project report	Start Nov 2016	End Nov 2016	1 Month