

**INVENTORY MANAGEMENT PRACTICES AND OPERATIONAL
PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES IN KENYA: A
STUDY OF PHARMACEUTICAL MANUFACTURERS IN NAIROBI, KENYA**

BETT KIPCHIRCHIR VICTOR

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF
NAIROBI**

DECEMBER, 2018

DECLARATION

I declare that this research project proposal is my original work and it has never been presented to the University of Nairobi or any other institution for any degree or any other academic award.

Signature.....

Date.....

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I confirm that the work reported in this research project proposal has been carried out by the candidate under my supervision.

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DEDICATION

This research project is dedicated to my family members for the moral, financial support and encouragement they have accorded me. Without them I would not have been able to complete this proposal.

ACKNOWLEDGEMENT

I thank the Lord Almighty for the gift of life and strength given to me for the development of this research. I appreciate the effort made by my supervisor during the report development stage. I also appreciate the efforts of my family, classmates and friends for both emotional and economic stability.

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ABBREVIATIONS AND ACRONYMS

ABC	-	Activity Based Costing
EOQ	-	Economic Order Quantity
EU	-	European Union
FIFO	-	First-In, First Out
GDP	-	Gross Domestic Product
JIT	-	Just-In-Time
KNBS	-	Kenya National Bureau of Statistics Report
MRP	-	Material Requirement Planning
MSEA	-	Micro and Small Enterprise Authority
MSME	-	Micro, Small and Medium Enterprises
RBV	-	Resource-Based View
ROI	-	Return on Investment
SMEs	-	Small and Medium Enterprises
SPSS	-	Statistical Package for Social Sciences
TCT	-	Transaction Cost Theory
USA	-	United States of America
VMI	-	Vendor Managed Inventory
VRIN	-	Value, Rare, Imitable and Non-substitutable

ABSTRACT

A number of factors including internationalization, artificial intelligence, diminishing resources, decreasing markets, increased substitutes, ever advancing technology and increased consumer awareness are dictating today's business environment. An environment that is highly organized but no longer humble and characterized with high levels of volatility. This outlook has made it difficult for many firms to create sustainable competitive advantage, as market customer loyalty and market share keep shifting from point to point. In the pharmaceutical sector, manufacturers are equally facing the same challenges as costs of production/manufacturing and regulations top the chart. Specifically, cost which is controllable factor poses great influence on performance and ultimately on the final net profit. Operations that include ordering, shipment and storage of raw material and component products represents an average of 70% of the total operational costs. The mismanagement of these particular sections guarantees complete failure of the entire firm if preventive and corrective measures are not put in place. Among the highly recommended measures we have use of technology, practices, management derivatives and motivation injection. The management of cost is normally based on inventory control and specifically through the use of practices. Practices that include economic order quantity, just-in-time, ABC analysis, vendor management inventory and material requirement planning. When these practices are optimally involved, operational performance is expected to expand. This research project sought to establish if the use of the practices by SMEs results to enhanced operational performance. The objective of the study was therefore to establish the relationship between inventory management practices and operational performance of small and medium scale pharmaceutical manufacturers in Nairobi. The study used resource-based view and transaction cost theory to provide understanding on the variables. Using descriptive research design, a census study was carried out on 16 SMEs in the pharmaceutical manufacturing sector. Two study questionnaires were distributed to each company using drop and pick criterion. Out of the 32 distributed questionnaires, 23 were returned, depicting a response rate of 71.8% (sufficient). Descriptive statistics indicated that all the five practices were variably used. ABC analysis, JIT, VMI, EOQ and MRP were found to have 69.57%, 65.22%, 56.52%, 52.71% and 34.78% recognition amount respondents. With an average 3.408 out of 5, EOQ, VMI, JIT, ABC and MRP had an extent application mean of 4.04, 3.5, 3.4, 3.3 and 2.8 respectively, indicating that EOQ was widely spread compared to MRP which scored least. From the correlation, a relationship R-value 0.558 with a coefficient of determination were obtained showing a positive relationship. The regression analysis equally indicates that a unit increase in the practices reflects into a positively increment of the operational performance indicators. Therefore, it is the study's conclusion that inventory management practices highly and positively influence SMEs operational performance.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Firms are currently facing intensive competition as business environment progressively changes (Umble & Haft, 2003). This allows liberalization of markets and inter-borrowing of operational ideas among peers (Drexl & Kimms, 2013; De Loecker & Van Biesebroeck, 2015). This competition has been identified to be as a result of factors that include internationalization, diminishing resources, artificial intelligence, decreased markets, increased substitutes, ever advancing technology and increased consumer awareness (Sharma, 2009; Sharma & Arya, 2016). All these factors lead to diminishing customer loyalty and market share. Competitive advantage has then become one of the major factors that organizations focus on. In response, firms must develop strategies, techniques and practices that can positively influence their survival and performance.

To attain competitive advantage, Inkpen and Ramaswamy (2005) assert that firms must consider the level of globalization and strategize accordingly. Further, these firms must relook at their capabilities and resources in advancing ways of controlling their market position and remaining relevant. To be competitive and successful, Pagell, Krause and Klassen (2008) and Jaber (2009) argue that organizations must adopt a supportive organizational structure, maximize customer focus, invest in skills, embrace technology and artificial intelligence, calibrate inventory and invest in research and development. However, the decision to focus on either solely depends on the organization's environment. Firms that are inventory-oriented must then consciously evaluate on ways

of enhancing performance and creating more value, especially when it comes to handling and forwarding of the inventory.

Through proper inventory management, firms can then establish optimal productivity that can lead to sound operational performance (Wisner, Tan & Leong, 2014). Gibson (2013) argues that processes instituted must be able to track value along the supply chain and continuously monitor demand, production and supply quantities. Structures and policies should equally be put in place to oversee these processes and systems, and offer accountability. Full operationalization of inventory management contributes to the firm's objective on effective usage of resources and operating under minimum costs possible.

1.1.1 Inventory Management Practices

Inventory management practices are policies and procedures developed by firms to ensure delivery of inventory objectives (Magad & Amos, 1986). Ross (2015) equally defines inventory management practices as entity techniques that are systematically integrated along the value chain to enhance cost saving and in time delivery of inputs and outputs. According to Brigham and Gapenski (2013), inventory includes supplies, raw materials, finished stock and work in progress. They further add that inventory management practices enable firms to track and control the inventory. These practices include: Vendor Managed Inventory (VMI), Material Requirement Planning (MRP), ABC Analysis, Just-In-Time (JIT), and Economic Order Quantity (EOQ). VMI is responsible for sharing of inventory and any other information among one's suppliers and customers (Disney & Towill, 2003). ABC prioritizes inventory into class A, B and C as per frequency of usage and economic weight and then ordering and stocking is done according to the resulting priorities (Mandal, 2012). JIT is an all-round waste elimination

philosophy that ensures least possible waste (Suresh, Nallan & Kay, 2012). And lastly, EOQ compliments all other practices by ensuring optimal ordering in quantities and processes (Smith, 2011; Drury, 2013).

The implementation of these practices ensures that the entire supply chain realizes smooth flow and functioning of value addition activities (Miller, 2010; Samak-Kulkarni & Rajhans, 2013). Dobler (2014) argues that effective inventory control leads to better overall performance, increasing total returns and breaking down system complexity. Heizer and Render (2014) indicates that inventory management practices enhance performance through establishing a balance between customer service and stock investment. It is then arguable that the practices protect firms against unplanned procurement and economically infeasible and fraudulent operations. They also enable systemizing of inventory related operations and supporting of product and materials mock. Through poor inventory projections and quantifying, firms can experience loss of revenue via forgone sales, holding costs or forgone value on wastage. It is therefore important for firms to institute inventory management practices to ensure that inventories are optimized and that they effectively respond to demand.

1.1.2 Operational Performance

Operational performance is the measure of outcomes against objectives, goals and standards of an activity, event or an undertaking (Terziovski, 1999). Wagner & Krause (2009) also defines operational performance as a measure on productivity, waste reduction, environmental responsibility, cycle time and compliance to regulations. Measure of operational performance is very important to firms as it contributes significantly to the overall organizational performance. Operational performance looks at

how proficient firm systems are in delivering results. Voss, (1997) and Owiny (2016) indicate that the main objectives of operational performance include cost; quality; flexibility and speed of delivery. Arguably then, organizations that specialize in either of or a combination of two or more of the objectives, realize a differentiated advantage that boosts their desired outcome(s), which in this case is minimized inventory costs. It is therefore essential for firms to institute systems and practices that contribute towards ensuring that inventory handling conforms to operational objectives. The implementation of inventory management practices primarily aim at reducing costs, at the same time ensuring that the other objectives are tracked and involved.

Operational performance is measured by use of either non-financial or financial indicators, with preference made on either depending on industry and organizational structures (Murthy & Sree, 2003). They further add that non-financial measures include measure of qualitative aspects while financial ones measure quantitative aspect. Financial measures include return on investment (ROI), stock-turn rate, annual stock-outs and total periodic inventory handling costs (Johnson & Scholes, 2007). Non-financial measures equally include internal and external customer satisfaction and overall improvement of organizational culture (Chin, 2010). Both dimensions of operational performance measure brings out the organization's commitment towards quality, cost, flexibility and speed of delivery objectives. However, this commitment must be operationalized along with the implementation of inventory management practices. The measure equally provides support in identifying the milestones taken towards achieving organizational performance goal(s). This study focused on stock-turn rate, annual stock-outs, total

periodic inventory handling costs and ROI to measure operational performance related to inventory management practices.

1.1.3 Small and Medium Enterprises (SMEs) in Kenya

Definition on SMEs varies from one industry to another. Bolton Committee (1971) defines Small and medium enterprises (SMEs) as business setups with small market share, managed by owners and do not form part of any other large enterprise. Tala (2014) defines SMEs as companies with less than 250 employees and less than 50 million euros in turnover. A number of criteria are considered when determining the right definition of small and medium enterprises. According to Buckley (1989) and Fujita (1998), these criteria include annual turnover, number of workers at a time and value of assets. Gati (2015) and Ngure (2015) have added the nature of premise -including space, sustainability and legality of business. There are also definition that are based on economic status. The United States of America's (USA) and China identifies SMEs to have a limit of 500 and 2000 employees respectively while in Europe it is less than 250 employees and an annual turnover of not more than 50 million euros (US Small Business Administration Report, 2017; China, 2015; EU Commission Recommendation, 2003).

Small and medium enterprises (SMEs) cluster in Kenya include micro enterprises and has a range of 10 to 100 employees (Soderbom, 2004; Kamweru, 2012). Early determination by Kinyanjui (1996) and Small and Micro Enterprise Baseline Survey (1999) gave the same upper limit of 100 but reduced the lower limits to 6 employees. Inclusion of micro enterprises in SMEs by the Micro and Small Enterprises Act (Act Number 55 of 2012) reduces the lower limit further to a sole operator. Meaning that the operator may equally be the owner. The upper limits of medium enterprises have also been revised by the Act

to 200 employees plus capital assets of about 2 million in Kenyan shillings (subject to revision with time). The Act also creates the Micro and Small Enterprise Authority (MSEA) that is mandated to promote and develop sustainability of these enterprises. This study confines to the definitions provides by the Micro and Small Enterprises Act (Number 55 of 2012) to classify SMEs in Kenya.

Statistics from the International Financial Corporation Report (2007) shows that SMEs in Kenya contribute to over 40% of employment and 20% of GDP. The Kenya National Bureau of Statistics Report (KNBS, 2016) indicate that there exists about 1.56 million licensed and about 5.85 million unlicensed SMEs across the 47 counties. A huge percentage of these SMEs, according to Wafula (2015), operate in wholesale and retail trade. It is also notable from the KNBS Report that motor vehicle and motorcycle repair accounts for 57.1 percent of the licensed SMEs. The SMEs sector in Kenya, along with MSEA as the regulator, sets an acceleration index upon vision 2030, aiming at playing a significant role in transforming Kenya to an industrialized middle income country.

However, there exists a sustainability challenge to these SMEs. Micro, Small and Medium Enterprises (MSME) KNBS Survey Basic Report (2016) indicate that about 2.2 million SMEs shut down in a span of five years, with most of them closing at an average age of 3.8 years. Further scrutiny revealed that inventory and performance management related issues mainly cause such closure. It is therefore a proposition of this study that instituting and operationalization of inventory management practices by the SMEs in Kenya can boost sustainable operational performance and reduce the closure rates.

1.1.4 Pharmaceutical Manufacturers in Nairobi

Pharmaceutical firms in Nairobi form the largest segment as far as locational distribution within Kenya is concerned (Export Zone Processing Authority, 2005); at about 60% of the entire industry (Cheroigin, 2014). Unlike the rest of the country, firms in Nairobi consist of three categories that include retailers, distributors and manufacturers of pharmaceutical products. This distinctive status makes Nairobi a powerhouse of the Pharmaceutical Industry, not only in Kenya but regionally. This statistic has been justified by Pharmacy and Poisons Board (2015) and Kenya Pharm Expo (2016), asserting that Kenya hold a regional supply market share of over 50% and most of this power concentrates in Nairobi. Further indications show that out of top 50 ranked pharmaceutical manufacturers in East and Central Africa, 30 of them are in Kenya, particularly in Nairobi.

According to the Kenya Poisons Board (2018), there exists 24 pharmaceutical manufacturing companies in Nairobi as illustrated in section A of appendix III. The companies are fairly distributed within Nairobi central business district and metropolitan. The pool included large multinational and local manufacturers as well as subsidiaries. Some of the manufacturers equally handle their first tier product logistics to various warehouses before duly registered pharmaceutical distributors take over the distribution chain. Out of the 24 companies, 16 belong to small and medium manufacturer category as indicated in section B of appendix II. However, the level of differentiation between small and medium manufacturers is highly indistinctive due to the rapid growth experienced in the industry. In fact, most of the medium manufacturers are slightly distinguishable from big manufactures and with the rapid growth rate expressed by Pharmaceutical and Health

Report (2016) and Macharia (2016). The growth rate of these companies has been attributed to reputation on good manufacturing practices that are put forth and advocated by the Kenya Poisons Board as well as smart operations that are based on verified inventory management practices.

1.2 Research Problem

Proper inventory management practice(s) is one of today's major business success factors (Gupta & Gupta, 2012), as supply chains, Pharmaplus Pharmaceuticals and other firms struggle with the challenge of calibrating a sustainable balance between holding inventory, inventory holding costs and demand. Ideally, these firms could want to have standby inventory to immediately execute supply as demand arises. However, this perspective equally raises the question of how economical it will be to undergo holding costs at the expense of unrealized demand (Ngumi, 2015). Excessive inventory takes up physical space, drives up storage costs and increases risk of damage, theft, spoilage and loss. Too little inventory also results to poor customer service as customer's needs cannot be met on time (Axsater, 2006). As indicated by Jaber (2009) striking an effective balance between inventory and demand enhances business efficiency, promoting operational performance and competitiveness.

In Kenya, SME's play a vital and significant role in contributing to economic development, creation of employment and subsequently alleviation of poverty. Despite the huge contribution these businesses make to the economy, the Kenya National Bureau of Statistics Reports (2016, 2017) estimates that about 2.2 million SME's shut down in every 5-year span. Unfortunately, some of the major reasons for this shut down trend include inventory management related problems. Among these SMEs we have

pharmaceutical manufacturers, who have taken a step towards inventory management practices to eliminate this threat and sustainably boost performance.

Various scholars have undertaken studies on inventory management practices and operational performance. Internationally, Rajeev (2008) sought to establish if inventory management practices affect economic performance of SMEs in Bangalore. The study established a significant and positive association between economic performance indicators and inventory management. It was also established that SMEs with sufficient inventory management comparatively perform better. A study carried out by Harishani (2010) in Sri-Lanka, determining whether inventory management practices have any importance in the food processing supply chains, indicate that supply chains that lack the practices experience high costs and poor partnerships. Samak-Kulkarni and Rajhans (2013) equally determined the optimal inventory model that can minimize inventory costs on records, concluding on Wagner-Whitin model.

Locally, Kinyanjui (2016) looks at the correlation between performance and inventory management practices among World Food Programme partners. Findings show a high positive correlation with Just-In-Time and Economic Order Quantity contributing more than other practices. Ontita (2016) on textile firms' performance and inventory management approaches establishes that many approaches are used but lack of policy frameworks delay and cripple the implementation processes. Wanyonyi (2017) on the other hand sought to establish if service delivery in major supermarkets has anything to do with inventory management practices. Findings show that the practices have enabled positive and concrete relationships with suppliers, ascertaining timely transactions.

This shows how extensive inventory management has been evaluated. However, none of the analyzed studies links inventory management to operational performance of Small and Medium Enterprises in Kenya. Many have dealt with the practices but on different contextual, hence the research gap. This study sought to bridge this research gap. To effect this, the study was guided by the following questions: To what extent are inventory management practices applied by small and medium pharmaceutical manufacturers in Nairobi? What impacts do inventory management practices have on operational performance of small and medium pharmaceutical manufacturers in Nairobi?

1.3 Research Objectives

The general objective of the study is to find out the influence of inventory management practices on the operational performance of Small and Medium Enterprises in Kenya.

Specific objectives include:

- I. To establish the extent to which small and medium pharmaceutical manufacturers in Nairobi use inventory management practices.
- II. To establish the relationship between inventory management practices and operational performance of small and medium pharmaceutical manufacturers in Nairobi.

1.4 Value of the Study

The findings of this study will inform small and medium pharmaceutical manufacturers on the positioning of inventory management practices on their operational performance, citing the possible areas that require improvements. The company can use the study to diagnose the processes involved, if required.

This study will benefit policymakers, especially the Micro and Small Enterprise Authority, as they seek to enact policies that promote growth and survival of SME's in Kenya.

The study will also form a basis for further studies in the field of inventory management and its linkage to a firm's performance especially for SME's in Kenya. Further boosting researchers with more literature on already existing knowledge in the field of small and medium enterprises.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review on inventory management practices of small and medium enterprises. It entails foundational theories, inventory management and operational performance, empirical review and the conceptual framework.

2.2 Theoretical Background

This study is based on the Resource-Based View Theory and the Transaction Cost Theory. The theories are discussed with an aim of illustrating how and why small and medium enterprises institute and operationalize inventory management practices.

2.2.1 Resource-Based View Theory

The Resource-Based View theory (RBV) was developed by Penrose (1959) with the aim of evaluating an organization's competitive edge using a particular or set of resources. The theory indicates that a firm's performance is always attributed to its specific resources and capabilities. The resources might be traditional or innovative. Traditional in this case refers to those that form the core inputs, while innovative ones refer to those that complement the traditional ones. According to Barney (1986), the focus on resourceful organizational resources and capabilities by RBV enhances the creation of sustainable competitive advantage. RBV, not only does it depict but also provides knowledge on how to identify these resources and capabilities. From the notion of identification and exploitation provided by the theory, it is assumed that firms that emulate RBV assure themselves of superior and long-term performance. To identify these

particular resource(s) and capability(s), the theory considers specific attributes that are abbreviated as VRIN. Rumelt (1984) expounds VRIN as resource and capability characteristic of value, rare, imitable and non-substitutable.

The characteristic of value (V) denotes that the resource(s) and capability in subject must poses superior qualities compared to those exhibited by competitor(s). Rare (R) means that the resources and capabilities will not be readily available to competitors. Imitable (I) means that duplication is nearly impossible. Non-substitutable (N) means that no other alternatives can qualify as perfect alternative (Barney, 1991). With VRIN, organizations are able to perfectly identify their own unique resources and capability and further exploit them to gain competitive advantage and long-term superior performance. In typical open-system modelling, an analysis using VRIN is carried out within the inherent industry and the unique resources and capabilities identified (Frawley & Fahy, 2006). The transformation process is then executed upon them by use of operational processes to gain value in terms on competitive advantage. The resources and capabilities include materials, information and customers. In this case, inventory management practices belong to the informational resource and capability segment. The practices complement the operations' transformative process by providing unique means and abilities to handle inventory at the least possible means and costing. At this point, RBV identifies inventory management practices as unique resource and capability and further explains how the practices can be optimized to enhance competitive advantage and performance.

With the RBV basis, this study gets to justify and illustrate the reasons behind the decision to institutionalize and operationalize inventory management practices, which is

all about enhancing competitive advantage. In small and medium scale enterprises operation, the theory shows and justifies how inventory management practices can be used as a capability and a resource to reduce waste and enhance value. RBV shows how small and medium scale enterprises use inventory management practices to better their competitive advantage.

2.2.2 Transaction Cost Theory

Transaction Cost Theory (TCT) was developed by Williamson (1975). The theory indicates firms can gain competitive advantage within the total cost curve through ensuring that tasks and processes are managed effectively and efficiently, and that cost of waste is at its lowest. TCT originated from the “*The Nature of the Firm*” by Coase (1937) who advocate that firms direct operations strategy towards the cost of the entire market, now commonly known as the value chain. Coase argued against the then assertion that the firm was a production function and instead insisted that firms exist in an organic relationship with the environment. From Coase and Williamson, it is deduced that costs form as one of the most important aspect and factor that shapes contemporary operations. According to Huo, Duan, Li and Tien (2012), TCT provides an agency-view whereby operational performance and cost management practices are in a mirrored relationship. With this agency-view, hybrid systems and practices can then be forged to aid in the facilitation of the controls.

Today, TCT is widely considered and prioritized by firms due to its focus on the whole supply chain cost (Kinyanjui, 2016). The theory further provides two probable means of handling costs efficiently. They include instituting cheap but optimal internal processes that are so effective that the second option of outsourcing becomes obsolete. However

choosing from the two perspectives depend on thorough considerations. These include uncertainty in transaction, specificity of the asset and the decision to develop processes of control and value creation (Gitau, 2016). After critically analyzing the costs associated with all options, the firm can then make a decision on whether to handle the controls internally or outsource to further eliminate the extra cost associated with the internal handling. The cons of the two options should also be weighed-in. With the outsourcing option, the firm might not get exclusivity in making real-time modifications to the outsourced task due to predetermined contractual specification that remain binding till officially reviewed. Internal controls on the other hand might perform poor due to the poor control culture. Irrespectively, the internal perspective has an upper hand especially due to its exposure to internal-related innovativeness and strategic practices. Practices that include inventory management practices.

The theory contributes to this study through demonstrating how cost is a major determinant of operational performance. TCT therefore provides firms with adequate and alternative means and ways of reducing waste and associated costs altogether. The theory also introduces a critical scenario of considering the involvement of the entire supply chain when instituting the inherent practices. It further justifies this supply chain factor through elaborating how its wastes and associated costs can directly impose internal inefficiency. In addition, TCT informs this study that inventory management practices are not feasible with outsourced services but when controls are handled internally.

2.3 Inventory Management and operational performance

Magad and Amos (1986) associates inventory management to organizational goal on effective customer service delivery. Kothari (1992) argues that more of these concerns

aim at increasing production efficiency. Another argument from Pong and Mitchell (2012) holds that inventory management is all about saving costs. Consolidating the three perspectives, it can therefore be understood that inventory management provides organizations with means of ensuring efficiency in the operational management of costing activities. According to Onyango (2016), inventory management links the externals to the internals of an organization, providing for a supplier and customer-based operationalization approach. This assertion by Onyango reflects on the foundation by the transaction cost theory that the value chain is as important as the firm itself, so any effect in either side quickly spreads to the other. So the wholesome value chain rethinking stands a better chance to enhance and sustainable firm's operational goals. This rethinking involves the incorporation of the inventory management practices along the entire value chain, especially in those value points that have the firm's direct costing influence. This aspect of inventory approach is known as supply chain management (Kimaiyo & Onchiri, 2014).

The incorporation of the supply chain management then widens the inventory management practices scope from those that reflect on the optimality of internal processes to include the inter-stakeholder related ones. The inclusivity then transfers the realized operational performance to the entire chain. Robinovish and Evers (2002) argue that the approach is very affective, especially when dealing with cost control in the retail sector. Some of the practices that focus on the internal perspective of the firm include ABC and economic order quantity (EOQ). Those that are engineered incorporate the supply chain include the Just-In-Time (JIT), Vendor Managed Inventory and Material Requirement Planning (MRP)

Inventory management practices form part of diverse techniques towards stock control in retail operation management (Robinovish & Evers, 2002). Their usage range, as pointed out by Jonsson and Mattsson (2010), varies from one organization to another depending on the type of inventory and cost saving philosophy adopted by the specified organization. As also mentioned by Vollmann, Berry, Whybark and Jacobs (2005), the type of inventory to be controlled and the subjective environment determines, of them, the most appropriate or less appropriate. Among these practices we have; The Economic Order Quantity (EOQ), Just in Time (JIT), ABC Analysis, Material Requirement Planning (MRP), and Vendor Managed Inventory (VMI) –all running internally and across organizations’ supply chains.

The EOQ practice is supply chain-based due to its order, holding and purchase predictive approach to the supply chain. ABC Analysis groups inventory in terms of importance and need to facilitate priority. JIT equally comprises sharing of the product designs with clients and suppliers to avoid order specific misinformation (Lazaridis & Dimitrios, 2005). On the other hand, VMI practice provides agreement between purchasers or seller and manufacturers which allows the manufacturer to assume the stock management role in the other part’s systems. Together, the inventory management practices enhance the reduction on ordering and holding costs as well as the purchase price and handling-related wastes (Ogbo, 2014). On fair observations, it is arguable that the practices equally enhance and built a firm’s learning culture.

Considering the structural foundation involving the institutionalization and operationalization of the inventory management practices, operational performance can perhaps be viewed from the cohesiveness perspective. A viewpoint which interrogates

how systematic firm processes are. One that is viewed by Brownell (2005) Kamau (2016) as integrative and informative in nature. Scholar that include Soderbom (2004), Huo et al. (2012), Wafula (2015) and Ngure (2015) affirm that operational performance of small and medium scale enterprise highly depends on integrative and informative systems, and feedback from the entire supply chain. Operational performance of pharmaceutical companies in particular requires sophisticated systems and highly responsive approaches. This is due to the nature of products and services offered, that require fast movement, careful handling and attentive to order specification.

2.4 Empirical Literature Review

A study by Rajeev (2008) sought to determine the economic performance effect of inventory management practices on Bangalore's machine tool SMEs. With assumption that inventory management have a critical decisive role in determining competitive advantage of manufacturing firms, the study performance an industrial empirical evaluation. The study was guided by the objectives of establishing the importance of inventory management in SMEs as well as identifying the relationship between economic performance and inventory management. With 91% response rate, 100 SMEs were sampled and served with semi-structured questionnaires. From findings, it was noted that all the adopted economic indicators had positive and significant relation to inventory management performance. However, the SMEs that had efficient inventory management systems comparatively showed higher and better performance that translated to higher returns.

Kasim, Zubieru and Antwi (2015) made an assessment of inventory management practices and SMEs in the Northern region of Ghana. The focus was directed to the

effects of inventory management on financial performance. The study adopted a descriptive cross-sectional research design. A semi-structured questionnaire was used in collecting of quantitative primary data from 300 SMEs. The SMEs comprised of 26 from manufacturing, 62 from dressmaking, 164 from trading, 38 from carpentry and 10 from hairstyling. Responses were coded and analyzed using inferential and descriptive statistics. Findings showed a positive relation between efficient inventory management and financial performance. Recommendations include managers viewing inventory management as a strategy that require reviewing from time to time –this will enhance effectiveness of the practices.

Mensah (2015) focused on effects of inventory management practices on hospital service delivery. The assumption was that the critical nature of hospital's operation requires real time response provided by inventory efficiency. The study used descriptive survey design along with a purposive and convenience sample size of 60 respondents. A questionnaire was used to collect primary data. Findings show that when supplies are supportive and quick in acting their role, hospital performance is enhanced. Further analysis established that the hospital highly utilized the VMI practice to ensure effective and reliable strategic supplier partnership. Conclusions indicate that inventory management practices are critical determinants of service delivery.

Ngumi (2015) carried out a study on effects of inventory management practices and how they affect productivity of large manufacturing firms. The study utilized a descriptive survey research design and a stratified sampling technique. A random sample size of 50 units was arrived at. A well-structured questionnaire with semi-structured questions was served through self-administration process. Findings indicated that there exists some

form of inventory management negligence that affects productivity in a negative manner. In some firms, some practices were instituted but were not operationalized. This lack of operationalization leads to further deterioration of productivity due to the passive influence that was experienced. The study concluded that inventory management practices significantly contribute towards realization of firm productivity.

Munyao, Omulo, Mwithiga and Chepkulei (2015) sought to establish how performance of production department in manufacturing firms is affected by inventory management practices. Specific objectives included to find out the applied practices, related levels of effectiveness, levels of performance and determining if the practices are computerized. A descriptive research design was adopted with a total population of 150 manufacturing firms in Mombasa County. Out of the 150, a stratified random sample size of 45 manufacturing firms was arrived at. The study used a questionnaire to collect data. Findings indicated various inventory management techniques employed by manufacturers. The techniques include material resource planning, just-in-time, economic order quantity, periodic review technique and the action level methods. Action level methods were found to be the most applicable technique, followed by material resource planning.

Ontita (2016) carried out a study on inventory management approaches and how they affect performance of firms in the textile industry. The study used descriptive cross-sectional research design and a census target population of 35 textile companies. Questionnaires administered in a drop and pick technique were used to collect primary data. Data collected exhibit both qualitative and quantitative nature. Analysis was aided with the use of Statistical Package for Social Sciences (SPSS). Findings established that

lean inventory system, information technology and strategic supplier partnership were the most used inventory management approaches. A positive relationship between operational performance and inventory management approaches was also established. However, recommendations showed the need to incorporate inventory practices like JIT and MRP and investment in modern technology.

Table 2.1: Summary of Empirical Review and Knowledge Gap

Author	Study	Methodology	Findings	Knowledge gap
Rajeev (2008)	How inventory management practices affect economic performance SMEs in Bangalore	Empirical evaluation, Descriptive survey, random sample, semi structured questionnaire	High performance against efficient inventory management systems	Contextual setup and evaluation on economic performance
Kasim, Zubieru & Antwi (2015)	Inventory management practices and SMEs performance in the Northern region of Ghana	Descriptive cross-sectional, stratified random sample, semi-structured questionnaire	Use of inventory practices with positive relationship with performance	Contextual setup and evaluation on financial performance
Mensah (2015)	Effects of inventory management practices on service delivery at St. Martin's Hospital	Descriptive survey, purposive and convenience sampling, and questionnaire	Extensive utilization of VMI and use of the practice to create supplier partnership	Contextual setup and focus on service delivery in Health Care sector
Ngumi (2015)	Effects of inventory	Descriptive survey, stratified sampling	Positive correlation,	Focuses towards

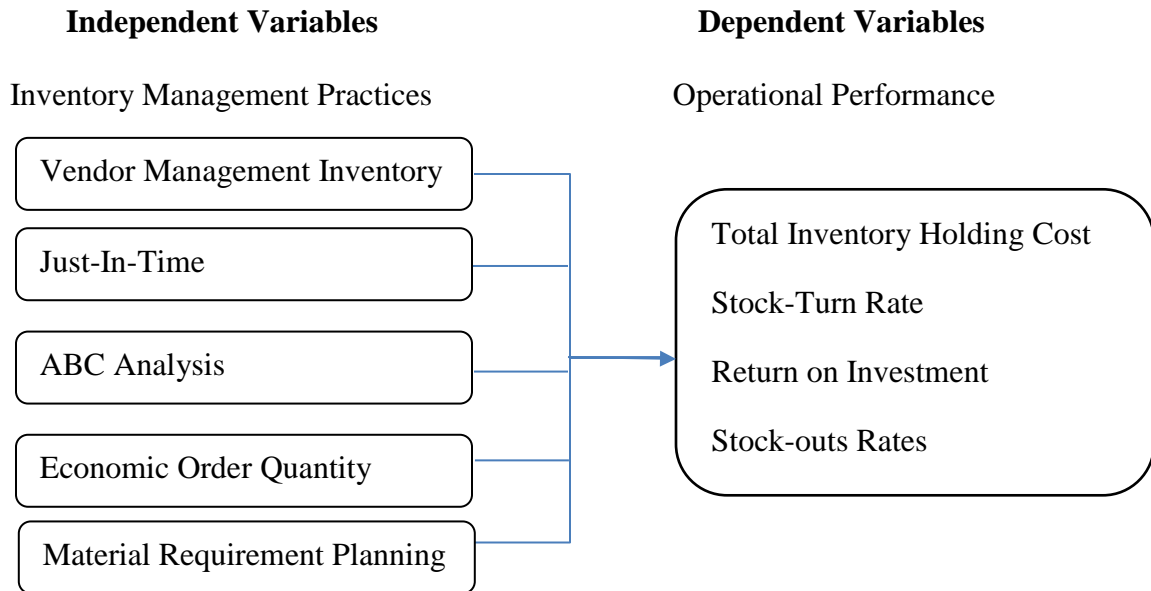
	management practices on large manufacturing firms' productivity	technique, self-administered questionnaire	implementation and operationalization negligence	productivity and manufacturing sector
Munyao et al. (2015)	Inventory management practices and performance in manufacturing firms	Descriptive research, stratified random sample, questionnaire	Correlation between the practices and performance,	Focused on manufacturing firms
Ontita (2016)	Inventory management approaches and performance of textile firms	Descriptive cross-sectional design, census study, questionnaire	Correlation between the approaches and performance, need for JIT and MRP	Focused approaches and textile industry

Source: Researcher (2018)

2.5 Conceptual Framework

Conceptual framework is a built construct illustrating variables which represent a group of characteristic measures that are subject to various attributes (Mugenda & Mugenda, 2003). The framework sub-divided the variables into two major groups: Independent and dependent variables. The two categorized variables exhibit a causative relationship in which the independent variables accommodate changes that influence the state of the dependent variables. The variables involved in this study are shown in figure 2.1

Figure 2.1: Conceptual Framework



Source: Researcher (2018)

The independent variable in figure 2.1 above directly determines the outcome nature of the dependent variables. This means that inventory management practices determine operational performance. In this case, the implementation of vendor management inventory, just-in-time, ABC analysis and economic order quantity will lead to enhanced operational performance in terms of reduced inventory holding costs, optimal stock-out and stock-turn rates, and improved return on investment.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methods that were used in conducting this study. It comprises of research design, target population, data collection method and data analysis techniques and procedure.

3.2 Research design

This study makes use of a descriptive research design. This research design is the most feasible one for this study in answering the what, which and how of inventory management practices and operational performance in SMEs. According to Mugenda and Mugenda (2003), descriptive design is highly effective in seeking to establish about the status of a process. Specifically, descriptive design was thought to be highly effective in identifying the relationship between the practices and inherent operational performance of pharmaceutical companies in Nairobi County.

3.3 Target Population

Due to the relatively small population, a census study was undertaken on small and medium pharmaceutical manufacturers in Nairobi, as listed in section B of appendix III. The respondents comprised of one top level or middle manager and one store keeper or store clerk from every pharmaceuticals manufacturing company. From the 16 target SMEs, sums of 32 respondents were approached.

3.4 Data Collection

This study makes use of primary data. Collection of data was carried out by use of a questionnaire. The questionnaire had two sections: Section A and section B. Section A dealt with data collection on practices used and the extent to which they are operationalized. Section B reflected on their impact on operational performance and any other concerns. Data collected exhibited both qualitative and quantitative aspects. The questionnaires were distributed using drop and pick technique.

3.5 Data Analysis

Obtained data was coded and analyzed accordingly. Descriptive statistics and inferential was engaged. A non-parametric F-test at 0.05 significance level was performed on analysis tools. To establish the first and second objective, data obtained from section A of the questionnaire was analyzed using descriptive statistics. The second objective that deals with the impacts of inventory management practices on operational performance and whose data will be obtained from section B was analyzed using correlation and regression. The following regression model was used.

$$Y=W_0+\beta_1X_1+\beta_2X_2+\dots+\epsilon$$

Key:

Y = Operational Performance

X₁ = Economic Order Quantity

X₂ = ABC Analysis

X₃ = Just-In-Time

X₄ = Vendor Management Inventory

X₅ = Material Requirement Planning

W₀ = Coefficient of intercept (Constant)

β₁... β₅ = Coefficient of variable X₁... X₅

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter focuses on the responses from the field, their analysis and discussion. The chapter relies on interpretation of the collected and analyzed data. The data exhibited both quantitative and qualitative aspects. Frequencies, percentages, mean and standard deviation were used to explain the responses to the questionnaires. Correlation and regression analysis were also used to explain the relationship between the variable. Conclusions and recommendations have also been made based on the analyzed data.

4.2 Response Rate

The study was carried out in sixteen (16) pharmaceutical manufacturers within Nairobi County as indicated in section B of appendix III. The pharmaceuticals enlisted were drawn based on their operational size, a characteristic focus identified herein as small and medium enterprise. A total of 32 questionnaires were issued; two in each small and medium pharmaceutical company.

4.3 Position of Respondents

From the data collected, out of the 32 questionnaires administered, 23 were completely filled and returned, which represents 71.8% response rate. This response rate is considered by Mugenda and Mugenda (2003) as a 'very good' response rate to make conclusions for the study. Initial expectation was that the response rate would be above 80% (excellent) as the respondents were pre-notified by introductory letter and via official phone call. From speculation, the self-administration process used on the

questionnaire might have contributed to the outcome. However, the response rate is still very good and sufficient for conclusions.

4.4 Inventory Management Practices Applied

Respondents were asked to indicate inventory management practices that are used in their companies. A pool of practices containing Economic Order Quantity, Just-In-Time, Material Requirement Planning, Vendor Management Inventory and ABC Analysis was provided. Respondents were given flexibility of indicating from the pool, those practices that their respective companies were utilizing. From the responses, practice frequencies summarized in table 4.2 were obtained.

Table 4.1: Inventory Management Practices applied in the company

Inventory Management Practices	Frequency	Valid Percent (%)
Economic Order Quantity	12	52.17
Just-In-Time	15	65.22
Material Requirement Planning	8	34.78
Vendor Management Inventory	13	56.52
ABC Analysis	16	69.57
Section Total (Respondents)	23	100

From the analysis and summary in table 4.2, respondents distributed their responses as follows. 16 (69.57%) of the 32 respondents acknowledged the use of ABC analysis in inventory management, 15 (65.22%) indicated just-In –Time, 13 (56.52%) indicated vendor management inventory, 12 (52.17%) indicated economic order quantity and 8 (34.78%) indicated material requirement planning. This clearly shows that half of the small and medium pharmaceutical manufacturing companies already have instituted and

operationalized ABC analysis inventory management practices in their operations. After ABC Analysis, there follows Just-In-Time, Vendor Management Inventory, Economic Order Quantity and Material Requirement Planning at 69.57%, 65.22%, 56.52%, 52.71% and 34.78% respectively. The percentage is a reflection of the institutionalization and operationalization of the practices and not based on approved for usage by the company. The assumption here is that a practice might be approved for usage but if it is not instituted and operationalized not many stakeholders will come across its usage.

4.5 Extent of Use of Inventory Management Practices

The study sought to identify if the pharmaceutical companies rolled out the practices in their entire network, be they production branches, holding and ware houses or distribution centres. Their responses are summarized in table 4.3 below.

Table 4.2: Inventory Management Practices

	N	Sum	Mean	Std. Deviation
Economic Order Quantity	23	93	4.043	0.82453
Vendor Management Inventory	23	81	3.521	1.12288
Just-In-Time	23	78	3.391	0.89133
ABC Analysis	23	76	3.304	1.06322
Material Requirement Planning	23	64	2.782	1.04257
				Average Mean= 3.408

The summary in table 4.4 above shows the mean and standard deviation of the application of inventory management practices in branches, warehouse and distribution centres. In the table, the practices have been arranged in a manner depicting the practices that are rolled out in most parts to the least.

A mean of 4-5 shows that the factor is highly rolled out to branches, warehouses and distribution centres. A value of 3 shows adequate roll out while a value between 1 and 2 shows inadequate roll out. Findings indicate a mean of 4.043 for the economic order quantity practice, 3.521 for vendor management inventory, 3.391 for just-in-time, 3.304 for ABC analysis and lastly 2.782 for material requirement planning. This results show that economic order quantity practice is used not only in the production centres but also in other centres that include warehouses and distribution centres, followed by vendor management inventory, just-in-time, ABC analysis and material requirement planning respectively. The average is 3.408, which is above average.

Note that all the considered branches, warehouses and distribution centres are all in Nairobi County. The poor distribution of the material requirement planning practices is attributed to its applicability. The practice is highly effective in production systems which in this will be in those branches where actual production takes place. ABC Analysis also shares the same attributes with material requirement planning, though its distribution was found to be a bit higher and above average. The other three practices that include vendor management inventory, just-in-time and economic order quantity are well and highly spread across branches and stores.

The study went further to ask the respondents of any other practice(s) used to compliment or used along with the economic order quantity, vendor management inventory, just-in-time, ABC analysis and material requirement planning. Out of the 23 respondents, only 4 provided a response to the question. Two (2) of the four indicated the use of FIFO (first-in, first-out) practice on store operations. One indicated the use of lean inventory while

the other indicated the use of six sigma. However none of the four gave further information on the practices. Due to ineffective response and explanation on this question, the researcher decided to exclude its further analysis

4.6 Application of Inventory Management Practices

Internal extent includes the level at which the practices are emphasized within one particular branch, most probably the main production centre. Based on the responses, findings have been developed and summarized as table 4.4 indicates.

Table 4.3: Application of Inventory Management Practices

Indicator	N	Sum	Mean	Std. Deviation
The company uses EOQ to control order quantities	23	103	4.478	0.73
The company uses ABC to control stock according to stock value	23	99	4.304	0.702
The company uses VMI to track stock and reduce unnecessary costs	23	97	4.217	0.902
The company uses EOQ to reduce stock holding costs	23	97	4.217	0.671
The company uses ABC to determine the products that require priority	23	95	4.13	1.01
The company uses JIT to ensure availability of required products at the right time	23	89	3.869	0.967
The company uses JIT system to reduce waste	23	86	3.739	0.963
The company collaborates with suppliers to ensure stock arrives at the right time	23	80	3.478	0.947
Average Mean=4.054				

The table 4.5 above shows the extent to which respondents from various pharmaceutical companies agreed on the inventory management practices. A mean of 4.478 of the respondent agreed to be using EOQ in controlling of all order quantities, a mean of (4.304) agree that their companies use ABC to control stock according to stock value, a mean of (4.217) of the respondents agree that their companies uses VMI to track stock holding cost. At a mean of 4.130, respondents indicated that EOQ is used in reducing stock holding costs at their company. With a mean of 4.130 respondents agree the company uses ABC to determine the products that require priority. A slight above average mean of 3.869 shows that a number of respondents agree that JIT system is used to ensure availability of products at the right time. A slight lower number of respondents at a mean of 3.739 thought JIT is highly used to reduce wastes. Finally, a mean of 3.478 of the respondents agree the company collaborates with the suppliers to ensure that their stock arrives at the right time. In the above analysis, an average mean of (4.054) demonstrates a much high extent of practice engagement among the SMEs in the Kenya Pharmaceutical Industry.

4.7 Operational Performance

The effect of the inventory management practice on operational performance was also sought by use of performance indicators. Respectively, responses were analyzed and summarized as table 4.5 shows.

Table 4.4: Impact of Inventory Management Practices on Operation Performance

	N	Sum	Mean	Std. Deviation
Reduced stock-out rate	23	101	4.391	0.782
Increased return on investment	23	98	4.26	0.864
Reduced inventory holding cost	23	96	4.173	0.984
Enhance stock-turn rate	23	82	3.565	0.895
				Average Mean= 4.051

From the table above, seemingly pharmaceutical companies are gaining a great deal from establishing Inventory Management Practices. From the calculated mean, the companies were able to reduce their inventory holding cost by a mean of 4.173, reduce stock-out rate at a mean of 4.391, Increased return on investment at a mean of 4.26 and finally enhance stock-turn rate at a mean of 3.565. Observation from the means shows clearly that inventory management practices exert high influence on the operational performance of pharmaceutical manufacturing companies in Nairobi. This is justified by 4.051 as the average mean.

4.8 Inferential Analysis

The following regression model was applied to measure the relationship between inventory management practices and operational performance of small and medium pharmaceutical manufacturers in Nairobi

The regression model was as follows:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \epsilon$$

Where:

Y = Operation Performance

β_0 = Constant Term

β_1 = Beta coefficients

X₁ = Economic Order Quantity

X₂ = ABC analysis

X₃ = Just in time

X₄ = Material Requirement Planning

X₅ = Vendor Management Inventory

Regression was carried out between the independent variable and the dependent variable.

The independent variables that represent inventory management practices include economic order quantity, ABC analysis, just-in-time, material requirement planning and vendor management inventory while dependent variable represent operational performance.

Table 4.5: Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.199	1.884		3.822	.001
Economic Order Quantity	.306	.266	.249	1.152	.025
ABC Analysis	.201	.286	.470	2.103	.041
Just-In-Time	.141	.203	.368	1.682	.111
Material Requirement Planning	.064	.202	.067	.317	.155
Vendor Management Inventory	.334	.227	.335	1.468	.030

The following regression analysis was obtained:

$$Y = 3.199 + 0.306X_1 + 0.201X_2 + 0.141X_3 + 0.064X_4 + 0.334X_5 + 1.884$$

Whereby Y is Operation Performance, X₁ is Economic Order Quantity, X₂ is ABC analysis, X₃ is Just-In-Time, X₄ is Material Requirement Planning and X₅ is Vendor Management Inventory. The model illustrates that when all variables are held at zero (constant), the value Operation Performance would be 3.199. However, holding other factors constant, a unit increase in Economic Order Quantity, would lead to a 0.306 increase in operation performance, a unit increase in ABC analysis would lead to a 0.201 increase in operation performance, a unit increase in Just-In-Time would lead to a 0.141 increase in operation performance and a unit increase in Material requirement would lead to a 0.64 increase in operation performance while a unit increase in Vendor Management Inventory would lead to a 0.334 increase in operation performance. This suggests that Economic Order Quantity, ABC analysis, Just-In-Time, Material Requirement planning and Vendor Management Inventory if employed in the organizations would all increase operational performance positively.

The study further shows that there is a significant relationship between operation performance and Economic Order Quantity (p=0.025), ABC analysis (p=0.041), Just- In-Time (p=0.111), Material Requirement planning (p=0.155) and Vendor Inventory Management (P=0.030).

Table 4.6: ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.521	5	1.104	1.536	.031 ^b
	Residual	12.218	17	.719		
	Total	17.739	22			

a. Dependent Variable: Operation performance

b. Predictors: (Constant), Economic Order Quantity, ABC Analysis, Just-In-Time, Vendor Management Inventory, Material Requirement Planning

The study used ANOVA to establish the significance of the regression model from which an f-significance value of $p < 0.031$ was established. This shows that the regression model has a less than 0.031 likelihood (probability $P = 0.031 < 0.05$) of giving a wrong prediction. The model is therefore sufficient enough to establish for the study's objectives.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.558 ^a	.311	.109	.84776	.311	1.536	5	17	.031

a. Predictors: (Constant), the Economic Order Quantity, ABC Analysis, Just-In-Time, Vendor Management Inventory, Material Requirement Planning.

A correlation value of 0.558 was established which shows a high relationship between dependent and independent variables. This is also shown by a coefficient of determination value of 0.311. The determination coefficient value indicates that the regression line accounts for 31.1% of the total observations.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter is a synthesis of the findings of the study. The study sought to establish the relationship between inventory management practices and operational performance of small and medium pharmaceutical manufacturers in Nairobi. Responses were obtained, analyzed and presented accordingly. This chapter deals with summary of findings, conclusions and recommendations.

5.2 Summary of Findings

The following were the summary of the research findings upon which the conclusion and recommendations of the study are made. The study was guided by two specific objectives. The objectives guided the basis upon which data was collected and analyzed.

From the findings, the questionnaires that were completed and returned by respondents were 23 out of 32, representing a response rate of 71.8%. The respondents were drawn from the operations office of each small and medium scale pharmaceutical manufacturing company. Two questionnaires were provided for each company.

From the analysis and findings, the following were listed as inventory management practices used and applied by the selected companies under survey; Economic Order Quantity, ABC Analysis, Just-In-Time, Material Requirement Planning and Vendor Management Inventory. This includes all the practices that were under observation. Economic Order Quantity was the most used inventory management practices by most

companies, followed by Vendor Management Inventory, Just-In-time then ABC analysis and finally but not least was the use of Material Requirement Planning.

From the analysis, generally there was a high agreement on the use of EOQ to control order quantities and in reducing stock holding costs, and for the ABC analysis the companies highly agreed to be applying it in determining the products with priority in the operations room and as well controlling the company's stock as per the stock value. For the Just-In-Time, the companies applied it in ensuring availability of required products at the right time. From the survey most of the companies uses VMI to track stock and in reduction of unnecessary costs and also to keep track of health relationship with vendors. In addition, the companies under survey moderately agreed that they collaborate with the suppliers to ensuring the stock arrives at the right time.

Under the impact of inventory management practices the study revealed that it greatly has an impact on reducing stock-out rate which again has increased the return on investment among the many small and medium pharmaceutical manufacturing companies. Again the companies have greatly reduced their inventory holding cost as well as enhancing their stock-turn rate. Therefore, ordering of material from suppliers and store replenishment are based on optimal ordering quantity policies. It was also established that the ordering of manufacturing materials at factory level and store requirements from factory packing are based on clients requirement mix.

Justin-time also plays a great role as stores and clients receive their orders within time specified and provided in the order documents. Communication and collaboration with suppliers and distributors was also found to be highly effective and paramount as vendor

management inventory system provided guidance. Lastly, the use of ABC analysis was established with many of the SMEs learning to purchase various materials and drug manufacturing components and supplements depending on the priority sheet notes. The sheet notes indicate rating on those drugs that are ordered more frequently and in bulk. The highly rated ones are ordered first and in large amounts.

The study further revealed that the Inventory management practices are responsible for the operational performance indicators of the SMEs. The effect is said to be at a greater extent in all indicators. The study established that the companies recorded better stock-turn rates over the years of inventory management usage. At the same time when stock-turn was enhanced, stock-out rate was found to be declining. The total inventory holding cost was also found to be in a declining trend; the cost involves the storage of already produced products and that of raw components. From the general combination of all the indicators of operational performance, the effect on return on investment was found to be highly positive. This was done by assessing the contribution of outcomes to final profits against the cost of establishing and maintaining the practices.

Using a multiple regression model, the data obtained from the respondents was used to regress inventory management practices against operational performance of the company. The analysis on the relationship between inventory management practices and operational performance revealed that an overall significant relationship ($P=0.031$) was attained. All of the five inventory management practices were found to be positively related to operational performance. The model was found to be significant, and all four practices (Economic Order Quantity, ABC Analysis and Vendor Management Inventory, Economic Order Quantity, Just-In-Time and Material Requirement Planning) were to be

significantly related to operational performance given a p-value less than 0.05. From the analysis, inventory management practices were regressed against operational performance as a whole. A correlation value of 0.558 was established which shows a relatively high relationship between dependent and independent variables. This is also shown by a coefficient of determination value of 0.311.

5.3 Conclusions

The focus of this research was to determine the effects of inventory management practices on operational performance of small and medium pharmaceutical manufacturing companies in Nairobi County. The study found that out of the five inventory management practices, Economic Order Quantity was the most embraced practice. Three of them, including Vendor Management Inventory, Just-In-Time were also slightly behind Economic Order Quantity practice but at a lower rate. The least applicable practice was found to be Material Requirement Planning. The practice was found to be positive but below average but with explanation that thoughtfully it might be due to its nature –which only allows its applicability to be within a manufacturing and processing setup. Thus to mean that inventory management practices have a positive impact on the operational performance of a firm. In general, the practices are effective in handling inventory costs and related targets. Their combined effects on operational performance is so intense to the extent that outcomes are way effective on the overall implementation costs.

5.4 Recommendations of the Study

Small and medium Pharmaceutical manufacturing companies in Nairobi County should now ensure that the use of the practices is incorporated in their entire supply chain. This is so to prevent spillover of unnecessary costs from other supply chain cost centers into the pharmaceuticals. This is based on the assumption that cost from one stage reflects in the next stage either in terms of prices or quality. To tame waste and costs in the whole supply chain one goes far in ensuring their internal practice responds positively from edge to edge. Vendor Management Inventory can be used to extend this coverage.

Another interesting observation made was that some of the practices were not uniformly applied in all the branches and owned warehouses and distribution centres of this pharmaceuticals. Despite this inconsistency, inventory costs from non-optimized centres spread to the main cost ledgers when calculating the costs by the entire company for example. The few warehouses, branches and distribution centres that are not compliant might be exhibiting high to extremely high costs which are finally compounded to the already compliant ones. Ensuring that all levels and units are completely subjective and optimized in one big step to eliminating drawbacks.

Practice implementation and maintenance should always go hand-in-hand. Implementation of the practices by these SMEs is not enough to create an impact and a simulation on the expectation. A couple of supportive practices should also be initiated. Chiefly, we have trainings. Trainings on the usage and maintenance of the practice is a major determinant of the outcome. It is only from the trainings that handlers can know how to utilize the opportunity and make results out of them. From the observations made from the responses in this study, it is my judgement that most SMEs might be having

these practices on paper but not operationalized nor instituted. Such an approach might even add weight and aid in the deterioration of the performance. Support to Inventory management practices is very necessary.

5.5 Limitations of the Study

The inventory management practices observed under this study are limited to five, which include economic order quantity, ABC analysis and vendor management inventory, just-in-time and material requirement planning. However, there exists other practices that some companies might be implementing. Such practices might include supply chain oriented ones such as lean and agility.

The second limitation of this study is based on its context. The study focused on small and medium sized enterprises within the pharmaceutical manufacturing industry in Nairobi County. First, none of the SMEs from outside of Nairobi was conducted and it is a scholarly justifiable assumption that location and environment determine and demand the type of inventory practices to use. Secondly, the focus was also on SMEs only. Meaning that no large pharmaceutical company was included in the study. The downfall of this is that the comparison required between SMEs and large companies will not be effected. It is an assumption that large companies have economies of scale attached to practice implementation, giving them an advantage.

5.6 Suggestion for Further Studies

There are three suggestion herein:

Further studies should be considered to explore the drivers and the challenges of inventory management practices in Pharmaceutical Companies. This would be useful to

understand the drivers that influence the embracement of inventory management practices and the challenges being faced by industries who have embraced inventory management practices.

Secondly, a study should be undertaken to incorporate those SMEs that operate outside of Nairobi County –probably the entire country. This will provide a more comprehensive outlook of the entire industry. The study might project new outlook as the current study is only confined to Nairobi County. The informing assumption behind this suggestion is that Nairobi County is unique to other counties due to its characteristics as a city county. This means that this unique characteristics might be highly informing operational performance or jointly with the inventory practices.

Lastly, another study should be carried out cutting across the entire industry, from SMEs to large pharmaceuticals. Maybe, a comparison between the SMEs and the large pharmaceuticals. This approach will provide information on large companies too who are less constrained to implementation resources due to their security in terms of economies of scale. There are chances that the level of implementation in this two categories is different, and if it is, then we need to know why and how and at the same time compare the operational performance.

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APPENDICES

APPENDIX I: INTRODUCTORY LETTER



UNIVERSITY OF NAIROBI SCHOOL OF BUSINESS

Telephone: 020-2059162
Telegrams: "Varsity", Nairobi
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P.O. Box 30197
Nairobi, Kenya

DATE... 14/11/2018

TO WHOM IT MAY CONCERN

The bearer of this letter... Bett Kipchurich Victor
Registration No... D61/75916/2012


is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.




PROF. JAMES M. NJIHIA
DEAN, SCHOOL OF BUSINESS

APPENDIX II: QUESTIONNAIRE

The questionnaire contains section A and section B.

You are required to answer all the questions.

Section A: Instituted Inventory Management Practices

1. Name of the Company

2. Position of the respondent

3. Which of the following inventory management practices are used in your company?

Kindly tick [√] appropriately in the box against the involved practice.

A. Economic Order Quantity

D. Vendor Management Inventory

B. ABC Analysis

E. Material Requirement Planning

C. Just-In-Time

4. Using a Likert scale, kindly rate the four inventory management practices in terms of the most used one to the least used. (1=no extent, 2=least extent, 3=moderate extent, 4=high extent, 5=extreme extent), Tick [√] appropriately.

Inventory Management Practices	1	2	3	4	5
Economic Order Quantity					
ABC Analysis					
Just-In-Time					
Vendor Management Inventory					
Material Requirement Planning					

5. Using a Likert scale, kindly indicate the extent to which you agree with the following statements on inventory management practices. (1=no extent, 2=least extent, 3=moderate extent, 4=high extent, 5=extreme extent), Tick [✓] appropriately.

Application of Inventory Management Practices	1	2	3	4	5
The company uses EOQ to control order quantities					
The company uses EOQ to reduce stock holding costs					
The company uses ABC to control stock according to stock value					
The company uses ABC to determine the products that require priority					
The company uses JIT to ensure availability of required products at the right time					
The company uses JIT System to reduce waste					
The company collaborates with suppliers to ensure stock arrives at the right time					
The company uses VMI to track stock and reduce unnecessary costs					

6. Apart from the mentioned practices, which other inventory management practice(s) is used by firm and how do they control inventory?

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Section B: Impact of Inventory Management Practices on Operational Performance.

7. Using Likert scale, kindly indicate the extent to which you agree with the following statements on how inventory management practices impact operational performance. (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree) Kindly tick [✓] in the appropriate box.

Application of Inventory Management Practices	1	2	3	4	5
Reduced inventory holding cost					
Increased return on investment					
Reduced stock-out rate					
Enhance stock-turn rate					

8. If any, kindly indicate other way(s) that Inventory management practices impact operational performance

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END
THANK YOU

APPENDIX III: PHARMACEUTICAL MANUFACTURERS IN NAIROBI

Section A: All Pharmaceutical Manufacturers

1. Alpha Medical Manufacturers
2. Aventis Pasteur SA East Africa
3. Bayer East Africa Limited
4. Beta Healthcare (Shelys Pharmaceuticals)
5. Cosmos Limited
6. Dawa Pharmaceuticals Limited
7. Didy Pharmaceutical
8. Diversey Lever
9. Eli-Lilly (Suisse) SA
10. Elys Chemical Industries Ltd
11. Glaxo SmithKline
12. High Chem East Africa Ltd
13. Mac's Pharmaceutical Ltd
14. Manhar Brothers (Kenya) Ltd
15. Novartis Rhone Poulenc Ltd
16. Novelty Manufacturers Ltd
17. Pfizer Corp (Agency)
18. Pharmaceutical Manufacturing Co (K) Ltd
19. Pharmaceutical Products Limited
20. Phillips Pharmaceuticals Limited
21. Regal Pharmaceutical Ltd
22. Universal Pharmaceutical Limited
23. Biodeal Laboratories Limited
24. Sphinx Pharmaceutical Limited

Source: Pharmacy and Poisons Board (2018)

Section B: Small and Medium Sized Pharmaceutical Manufacturers

1. Aventis Pasteur SA East Africa
2. Bayer East Africa Limited
3. Beta Healthcare (Shelys Pharmaceuticals)
4. Dawa Pharmaceuticals Limited
5. Didy Pharmaceutical
6. Diversey Lever
7. Elys Chemical Industries Ltd
8. High Chem East Africa Ltd
9. Mac's Pharmaceutical Ltd
10. Manhar Brothers (Kenya) Ltd
11. Novartis Rhone Poulenc Ltd
12. Pharmaceutical Manufacturing Co (K) Ltd
13. Pharmaceutical Products Limited
14. Universal Pharmaceutical Limited
15. Biodeal Laboratories Limited
16. Sphinx Pharmaceutical Limited

Source: Pharmacy and Poisons Board (2018)