JUST-IN-TIME PURCHASING STRATEGIES AND OPERATIONAL PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

BY

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DECLARATION

I hereby declare that this project is my original work and has not been presented to any other university for examination purposes.

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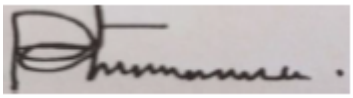
D67/33243/2019

This research project has been submitted for examination with my approval as a University of Nairobi supervisor.

Signed  **Date__26th August 2023__**

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DEDICATION

I dedicate this project to my family and friends for their unwavering support, encouragement and belief.

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ABBREVIATIONS AND ACRONYMS

COVID	Corona Virus Disease
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
JIT	Just-in-Time
KAM	Kenya Association of Manufacturers
R&D	Research and Development
TOC	Theory of Constraints
TQM	Total Quality Management
US	United States

ABSTRACT

The study had the objective of establishing the JIT purchasing strategies that are commonly used in Nairobi's manufacturing firms and ascertain the effect of the JIT purchasing strategies on operational performance of all manufacturing industries within Nairobi County, Kenya. The study therefore identified JIT purchasing strategies that are commonly used by manufacturing firms, which included supplier strategy, quantity strategy, quality strategy and shipment strategy and used them as the study's independent variables while the operational performance was the dependent variable. The study adopted a descriptive research design where primary data was obtained through administration of structured questionnaire. The target of the study was a population of all the 149 manufactured firms within Nairobi County that are registered with KAM and out of the 149 questionnaires given to these firms 106 responses were collected which constituted 71.1% of the response rate. Descriptive analysis established the means, mode, and standard deviations to describe different statements' responses that assessed the incorporation of the study variables in firms' operations. The study utilized regression analysis to establish how operational performance of manufacturing firms is influenced by JIT purchasing strategies. In the findings the study identified that the model used only explains 38.3 % of the changes on operational performance indicating that the other factors that are not covered by the study influence 61.7% of operational performance. Supplier strategy had a negative effect of 0.050 on operational performance, quantity strategy had a positive effect of 0.101 on operational performance, quality strategy had a positive effect of 0.282 on operational performance and lastly shipment strategy had a positive effect of 1.134 on operational performance.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Due to drastic changes in technological developments in today's workplace and globalised economy, companies are seeking for best practices that will enable them to survive and maintain their competitive advantage while improving their performance (Covey, 2014). Major flaws were present Japanese manufacturing system that related to inventory shortfalls, defects of product, rise in production costs due to waste, and production delays (Daniel & Reitsperger, 1996). This led Toyota Company in Japan to develop the Just-in-Time (JIT) strategy to enable them reduce waste while improving their operational performance (Daniel & Reitsperger, 1996). Admittedly, JIT is a production method that emerged from the necessity to develop a fault free process (Cheng & Podolsky, 1996).

Businesses can benefit from Japan's manufacturing success in the 1980s finding just-in-time (JIT) strategies to be lucrative since they keep production costs low while maintaining high product quality (Daniel & Reitsperger, 1996). According to Slack, Chambers and Jhonston (2007), JIT strategies are concepts that are operational and give focus on how to meet demand while eliminating waste to produce quality products. According to Kinney and Wempe (2017), the strategy of JIT come into play to maximise usage levels of limited resources that were available in India. Lee & Paek (2015) on the other side revealed that JIT was welcomed in China in order to be used as a tool that will help companies minimise the level of inventories since the level of inventory on average is a function of the number of products produced per batch. However, in the US, JIT has not been well embraced due to low levels of awareness notwithstanding its benefits (Goyal & Deshmukh, 2012).

Across the globe, manufacturing industries have gone through marvellous changes during the last three decades. This has necessitated changes in the management of manufacturing firms when it comes to their approach and systems used in the process of production customer expectations supplier attitudes and their behaviour in the competitive market (Ahuja et al., 2006). During this high rate of changes in the modern era, competition among firms around the globe has increased anticipations of the manufacturing companies (Miyake and Enkawa, 1999). Marketplace around the world has experienced increased pressure from buyers/customers in the service and manufacturing industries (Basu, 2001; George, 2002).

1.1.1 Just-in-Time Purchasing Strategies

JIT purchasing is a concept that is used in procurement that deals with deliveries and dispatches through accurate, timely, reliable and frequent deliveries of goods and services in exact quantities (Schonberger and Gilbert, 1983). According to Yang et al., (2007), the concept requires suppliers with close range or who are near to make timely deliveries of goods and services when needed to meet the demand in today's competitive market. This helps reduce costs that are incurred between the customer and the supplier while ensuring that the response time is as minimal as possible. Lorefice (1998) stressed that for the arrangement to take place effectively, a sort of partnership between the supplier and the customer must be established in order for the production process to be effective under JIT process. The idea of JIT purchasing is to reduce defects in goods that might need to be transported from a far distance since in close proximity, chances of defects are low while improving quality of products (Yang et al., 2007).

JIT purchasing dictates that selection of suppliers be done with the aim of reducing waste as much as possible, minimize inspection and reduce operational costs with reduced paperwork and frequent, smaller batch deliveries. (Yang et al., 2007). In as much there are benefits of purchasing small, needed quantities from the nearby supplies, quality assurance becomes an important requirement for establishing a relationship with a company operating under JIT purchasing. According to Lorefice (1998), Firms that work with JIT should ensure that one supplier deals with one product delivery under a 'one supplier per product' rule. This is to ensure that each supplier has a specialty in that product to maintain quality of products delivered into the firm for quality end result.

Wong and Johansen (2006) states that JIT suppliers work well with JIT manufacturing firms hence considered ally with each other. The relationship that exists between the supplier and the supplied firm should be long term for future deliveries of products and services in time and at the right quantity. Since the provider is an upward expansion of the JIT company's tasks framework, the stake in the JIT firm increments for this partner bunch. It is sometimes crucial for JIT organizations to reduce their provider bases in order to establish and maintain connections of this power. Single sourcing may be used in the absurd situation (Peters and Austin, 1995).

1.1.2 Operational Performance

The fulfilment of specified roles and duties with assigned set parameters such as regulatory compliance, waste minimization, and production efficiency to be met are referred to as

operational performance (Samson and Terziovski, 1999). According to Neely (2005), operational performance is described as a set of criteria applied to accurately measure efficacy and actions effectiveness. Measures of operational effectiveness include flexibility, productivity, timeliness, cost, quality, efficiency, and effectiveness (Neely, 2005). Productivity metrics, quality metrics, inventory measures, and quality-related costs are only a couple of the performance indicators that Birech (2011) lists for operations.

Units produced, scrap rate, safety incidents, inventory turnover ratio, defect or recall rate, production cycle time, facility utilization rate, and total cost of production , average productivity leisure time, and client satisfaction are all factors that affect operational performance in the manufacturing sector. (Perez, 2001). Although majority of organizations place more weight on using financial figures as a measure for performance, they need to explore a broader analysis of performance. A comprehensive evaluation of performance should be conducted with a firm grasp of lean principles and the (TQM) and methodology in mind (Stewart, 1997).

1.1.3 Manufacturing Firms in Nairobi County, Kenya

Manufacturers are essential to Kenya's economic growth, with a general objective of growing their share of GDP by at least 10% annually. Their main targets are to enhance production capacity and aim to have regionally synthesized goods constituted of local content, to generate and use more research and design results, to boost the share of goods in the local market by 7 versus 15%, and to develop niche markets.

However, the high cost of doing business, little research and development, poor and bad institutional framework, old technologies, insufficient operational skills managerial, low capital injection, and currently the outbreak and spread of the novel coronavirus have significantly impacted manufacturing in Kenya. Because of the outbreak, raw materials and manufactured goods are both impossible and slow to be delivered to the ports due to the lockdowns. Currently, countries have gone low in importing raw materials needed for production process and have focused in importing COVID 19 vaccines, pharmaceuticals and medical equipment. As a result, shipping lines are not utilised to maximum bring imbalance between revenues and operational costs. Additionally, important growth areas, for example, air cargo facilities, shipping ports, warehouses, inland container depots, government authorities, terminals, and customs are experiencing a severe shortage of manpower due to lockdowns which greatly disadvantage any scope of the supply chain movement.

1.2 Research Problem

An increase on quality of products and satisfaction of customers has been the core aim of manufacturing firms (Wheatley, 2005). Many manufacturing companies have been struggling to find new ways of cost reduction without affecting quality of services and products and still meet customer needs. As a result, firms have adopted JIT purchasing strategies in order to ensure that products and services offered meet customer needs and are available when needed while offering exemplary service delivery (Bowell, 1987). According to Mukovi & Irava (2015), operational costs increase when there is poor management of inventory, high handling costs when ordering more inventory than needed, when the available inventory is insufficient and when firms meet unnecessary costs when sourcing for inventory that is supposed to be at the warehouse in order to ensure it is. In firms without proper inventory systems, costs go up leading to low operational effectiveness thus making organizations to be inefficient in the provision of services to customers as well as establishing poor reputation with its clients (Mukovi & Irava, 2015).

Manufacturing companies in Nairobi County must be competitive both locally and internationally since the industry affects the overall economic scope of Kenya's development. However, economic review of Kenya reveals modest development has been experienced in the manufacturing sector. In recent years, the sector only grew by less than 6%, according to the Republic of Kenya Economic Survey from 2015, 2016, 2017, and 2018. The primary causes of the sluggish growth, according to economic studies, are high manufacturing costs and competition from foreign goods. Due to rising production costs in Kenya compared to other African nations, companies like Reckitt Benckiser, Kenya Fluorspar, Colgate Palmolive, Devki Steel, Cadbury Kenya, Tata Chemicals, Eveready, and Bridgestone and Procter & Gamble have relocated their headquarters from Nairobi County, Kenya (Wafula, 2016). This points to a performance disparity in Nairobi County's industrial sector, which is what this study intends to fix.

JIT approach can be one of the ways to increase organizational performance, according to global and local research by Rasit et al. (2018), Rahmani & Nayebi (2014), and Wyk & Naidoo (2016). A study by Capkun, Hameri, and Weiss (2009) in Italy on the inventory and financial performance in manufacturing firms found that the relationship between inventory and performance differed depending on the what inventory is used and what financial performance reference is used. On the other side, a study by Wheatley (2005) gave reasons why firms are trying to apply lean thinking at their environment of work. Another study by Womack and Jones

(2003) provided the need for a strong will from top management when transforming from old ways of production process to the new production processes that eliminates waste.

A study by Kinaro (2016) looked at operational strategies used in manufacturing firms for competitive advantage in Kenya. They found that having supplier strategic relationship, positive customer relationship, well implemented lean practices and reliable quality of goods produced increases operational performance. The study did not look at JIT strategies but looked at operational strategies. Onserio (2011) on the other hand focused on manufacturing competitive priorities of multinationals but not JIT strategies. Another study by Chombo (2009) had an investigation on the global credit crunch on Foreign Direct Investment (FDI) inflows in the manufacturing sector in Kenya. The study found that FDIs have a minimal contribution to the value of manufacturing firms in the country. This study will investigate the value JIT strategy will have on the manufacturing firms which was not investigated in this study. From the research mentioned above, insufficient focus has been placed on the impact that JIT purchasing has on of manufacturing firms' operational performance within Nairobi County. By addressing the research question, what are the consequences of JIT purchasing methods on operational performance of manufacturing enterprises in Nairobi County, Kenya? this study aims to close the knowledge gap.

1.3 Research Objectives

i. Assess the JIT purchasing strategies commonly used by manufacturing firms in Nairobi County, Kenya.
ii. Ascertain the impact of JIT purchasing strategies on operational performance of manufacturing firms in Nairobi County, Kenya.

1.4 Value of the Study

JIT strategies help manufacturing firms in Nairobi County, Kenya, to eliminate waste. Practices such as stock control and proper control of work in progress, are very significant for the performance of manufacturing firms (Wild, 2002). Each and every stakeholder in the firm needs to be aligned to a culture that strives for this, and JIT purchasing strategies present a channel through which this can be achieved with more ease, and not just by management.

The results of the study will show the advantages of appropriate procurement practices, which make sure that businesses are always functioning. Additionally, the results will emphasize the significance of JIT techniques and help firms meet and exceed operational performance goals.

The report could be useful to the government in developing national policy pertaining to JIT tactics. Despite the importance played by procurement and the government in fostering an environmentally friendly environment, the public procurement Act of 2006 does not contain a guidance on JIT techniques in Kenya. To different partners and strategy creators, the examination discoveries may be critical to them, and it will help them to make acquirement strategies that are pointed toward guaranteeing effective acquisition methods that decrease squander. Effective obtainment techniques will guarantee that labor and products are acquired on schedule and in this manner functional execution in such firms is improved.

Managers could gain from the content in this study as a source of inspiration for growing and modifying their procurement function into an environment that spurs a modern, dynamic, and rigorous firm. The examination gives foundational data to different analysts and researchers who might need to additionally explore the field and will also add esteem in understanding the how innovation can better align to the institutional hypotheses and climate. Moreover, the review can be relied upon to educate different specialists on the impacts pertaining to acquisition innovation within regions.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of prior studies done by other researchers. It presents the theoretical framework under which the study is anchored on, a review of JIT strategies and provides empirical review within the study scope.

2.2 Theoretical Framework

This section presents three theories that this study is supported by, namely Lean Theory, Value Chain Analysis Model and Theory of Constraints (TOC).

2.2.1 Lean Theory

Lean theory, initially postulated by John Krafcik (1988), offers a systematic approach to identifying and eliminating non-value-add elements (wastes) through continuous improvement. This methodology aims to optimize processes, ensuring that products are delivered precisely when and where customers require them. The core principle of Lean theory is rooted in achieving operational excellence (Andersson et al., 2006), emphasizing efficiency and originality in the pursuit of value creation. The lean theory explains how manufacturers can increase purchasing flexibility, decrease the amount of inventory kept on-site, and get rid of costs associated with holding or maintaining inventory. Like JIT, Lean attempts to establish a continuous and smooth progression through eliminating non-value-add elements and employing pull systems.

To ascertain JIT purchasing strategy influence on operational performance, Lean Theory was found to be appropriate. The theory was selected for this study from the necessity of investigating how the strategy of JIT impacts organizational performance. (JIT) is regarded as a potent instrument for minimizing non-value add elements and inefficiency, accelerating the process of production, and improving delivery results (Danese & Romano, 2011). This aligns with the principles of Lean Theory.

2.2.2 Value Chain Analysis Model

John Krafcik (1988) introduced Lean Theory as a systematic approach to identifying and eliminating non-value-added elements through continuous improvement. The core idea is to optimize processes, ensuring products are delivered precisely when and where customers need them. This methodology emphasizes operational excellence, striving for efficiency and value creation. It aims to streamline operations by reducing non-value add elements (waste) and

improving flow. Lean Theory has since become a widely adopted framework in various industries for its effectiveness in enhancing productivity and customer satisfaction. Its principles have revolutionized how organizations approach process improvement and non – value- add elements (waste) reduction. Lean Thinking focuses on providing value to customers while minimizing resource wastage.

2.2.3 Theory of Constraints

The Theory of Constraints, articulated by Goldrath in 1984, contends that organizations are inclined toward lean thinking when they encounter constraints arising from limited resources for managing larger production. Under these circumstances, companies grapple with distinct limiting factors as they endeavor to attain specific output levels (Goldratt, 2014). The theory of constraints necessitates a thorough examination of all your processes, emphasizing the need for careful analysis. The theory requires that organisations should eliminate constraints by excluding any activities that do not contribute value to the desired output. According to Umble and Spoede (2011), once the weakest point or link in the production process is strengthened, that means that the strength of the wholeprocess is has been strengthened. Therefore, there need to be improvements in the entire production chain that targets the weakest points or areas. According to the theory, major constraints that need strengthening are the procedures and policies implemented for the production of quality products (Weston, 2017).

The theory of constraints is determined to be pertinent to this study since it emphasizes many and interdependent organizational processes, including the connections between various departments, processes, and roles where materials are turned into the final product in manufacturing businesses (Fawcett & Pearson, 2011). TOC adds the cycles utilized in activities into a straightforward construction of throughput, stock, and working costs (Fawcett and Pearson, 2011). TOC identifies with lean thinking in that both underline on functional execution fully intent on accomplishing high outcomes and returns.

2.3 Just-in-Time

(JIT) is a philosophical approach encompassing essential principles and concepts. According to Bicheno (2004), the success of JIT operations is highly dependent on a number of tools, approaches and techniques. Practically, JIT makes the assumption that organizations are composed of processes. Jones (2004) further indicates that this assumption suggests that any advancements that have been made following JIT context maximizes the customer process rather than optimizing departmental process.

JIT was aptly positioned as elimination of wastes that don't add value across the manufacturing line from the factor of an order being located to its payment by means of the consumer, by way of its pioneer Taiichi Ohno. After the Second World War, the Japanese possessed a notably robust motive to expand precise manufacturing processes to help them repair their economy. This was one driving factor for the growth of JIT and other advanced manufacturing methods (Cheng, 1996). Toyota engineers used to identify seven different types of waste: Overproduction, excess stock, repairs or flaws, motion (pointless motion), processing, waiting, and transportation waste (Liker, 2004).

JIT has strategic and operational perspectives that it can be vied from. From the strategic perspective, principles of JIT are focuses, while from the operational perspective, tools and techniques associated with JIT are focused (Hines et al, 2004). The relationship between both approaches presents an important distinction when analysing usage of JIT among manufacturing firms in Nairobi County, Kenya. There are key criticisms when it comes to the gaps that come along with the usage of JIT strategy which are concerns about high rise weaknesses of a JIT strategy, proposals that JIT strategy does not cope with changes in demand, the possibility of a failure to address the dimensions of human at as well as their working conditions, and an absence of distinct strategy during the implementation the techniques and instruments of a JIT strategy (Dean, 2000).

Bane (2002) argues that governments are finding JIT strategies helpful in the delivery of better services under smaller budgets while facing exceptional pressure to provide cost-effective solutions. The governments however need to tackle obstacles such as an absence of a profit motive, civil-service regulations that may restrict labour elasticity, and lack of competition in their quest to implement JIT programs successfully. The programs can attain success only if the public sector garners the capacity to harmonize the interest and balance the workforce's ability to engage in meaningful roles while meeting increased demands with constrained resources.

JIT strategy has been of use by many manufacturers with the aim of improving their operational performance from all angles (Masudin and Kamara, 2018). Astonishingly, the JIT strategy has not been taken up in developing countries and in developed countries, manufacturing sectors are run using the old production systems that have old ways of operations with no or little value addition towards the culmination of the production process (Adeyemi, 2010). The JIT procurement technique guarantees that the firm will receive the precise amount of resources and raw materials. To prevent waste, holding them in inventory for later use, or making clients wait a long time to obtain the finished product, JIT procurement only purchases the exact

amount of products and services that are required when they are required, without any excess and without any kind of delay (Kabuga, 2012). This underlines the use of the JIT process as an effective approach to attain benefit in procurement endeavors.

According to Demeter and Losonci (2013), lean corporations have gone as far as managing their supplies using JIT purchasing. Buyers in JIT purchasing are motivated to make their purchases from several small number of suppliers (Landry, 2008). Suppliers who are close to the manufacturing firms have advantage of having to supply the shortest time possible when a resorce or service is needed reducing waste of inventory and the transport costs associated with the supply and also close locations of suppliers and manufacturers reduces the uncertainties (Cheng, 2011). JIT strategy requires suppliers to have certification to prove that goods and services supplied for the process of production are of the desired quality and have successfully passed a quality assessment (Singh et al., 2013).

Voss and Robinson (1987) are of the view that JIT is a production method that had the sole aim of improving the overall productivity through eliminating waste and which delivers better quality products. When used as a process of manufacturing, JIT allows for the effective manufacturing and timely delivery of essential, top-notch components in suitable quantities, at the right places and schedules, all while optimizing the utilization of accessible resources like materials, facilities, workforce, and machinery. Thus, achieving the ideal equilibrium between the consistency of the user's predetermined needs and the adaptability of the manufacturing procedures of the supplier is crucial to the process. This is accompanied by the use of specific techniques that need comprehensive human resource involvement as well as teamwork.

It is the main focus of JIT production strategy to eliminate inventories and reduce wastage during the production process. According to Peters and Austin (1995), reducing buffer inventory during the production process requires closer integration and synchronization. This will ensure that the reduction in inventories happens while maintaining the quality of products that come out of the production process. According to Monden (1993), firms that work with JIT production to ensure inventories are reduced without compromising on quality might lead to low operator’s creativity and motivation. Monden (1993) continues to explain that production operators are assisted to reduce wastage and cost by encouraging their skills. JIT production dictates that every worker must be permitted to take part in the process of production for them to get a chance to make contributions and suggest improvement areas (Monden, 1993).

Proper functioning of JIT production needs a high-quality standard material through a program called self-stopping (Peters and Austin, 1995). Under self-shopping, it is the responsibility of the production operators to stop the production process if they feel that there is something that is affecting the quality of products being produced. According to Peters and Austin (1995), the underlying cause of the issue that was affecting the quality of the product must be identifies by the operators and managers and corrective action undertaken before restarting the process. JIT production requires operators to perform additional work or duties such as balancing production and inventory control, undertaking various tasks, self-inspecting their own work, addressing non-conforming (faulty) components, configuring production machinery, and conducting preventive and minor maintenance on their equipment of production.

According to Evans et al. (1990), JIT execution should begin at the top, with full support from every administrative level. So even though the adoption of (JIT) results in numerous transformations in a hierarchical design, recognize that these changes may lead individuals to perceive and approach matters from unanticipated perspectives. Preparation should focus on a fundamental understanding of the specialized parts of JIT and also the influence that JIT will exert on the work atmosphere without commitment from the top administration, JIT execution cannot be successful. The board needs to provide resources like JIT instructions and preparation that are crucial to an execution (Zhu and Meredith, 1995). Three categories of authoritative assistance were mentioned by Chong et al. (2001): top administration support, center administration support, and front line administrator support. The administration responsibility to a JIT producing structure, according to Chandra and Kodali (1998), should start at the top level of administration and flow down through all levels of the business.

Kenneth et al., (2011) points out that JIT sales is critical to the success of a firms marketing strategy since buyer-seller linkages must be created for a profitable implementation. In the current competitive market, customers always strive to purchase quality products in a timely manner while strengthening relationship to better adapt to shifts in client demand by working with customers (Green and Inman, 2006). According to Claycomb et al. (1999), JIT sales puts into play customer relationship as the comprehensive problem-solving endeavors under the JIT strategy. This leads to the concentration in improving quality and ensuring timeliness in delivering products to customers that are located externally.

JIT sales are driven by demand. According to Lorefice (1998), the start of a production of a commodity under JIT strategy starts with demand in the market or requests from customers. The buyer of the item is the one who initiates the final step in the production chain, this last

connection pulls its preceding and so on. Where organizations utilize traditional push frameworks, financial risk goes up because produced products lose value daily, they are kept because of decreasing product lifecycle with Positive cash-to-cash cycle where buyers get possession of the product after they have made payments (Papadakis, 2003). Organizations that use push-based frameworks habitually endeavor to limit hazard by deferring end result get together until items arrive at neighborhood wholesalers who are liable for eventual outcome arrangements.

2.4 Just-in-Time Purchasing Strategies

JIT purchasing is a concept that promotes product or service delivery frequency in small lot sizes from suppliers (Schonberger and Gilbert, 1983). This makes it possible to maintain buffer inventory at zero levels by continuous, one-at-a-time distribution from supplier to user. Schonberger and Gilbert (1983) assert that JIT purchasing enables businesses to keep zero stocks throughout the whole production process. Small lot sizes allow the organization to conserve space and reduce the cost of maintaining a large inventory (Isa and Keong, 2008). According to Dong et al. (2001), the JIT purchasing approach involves smaller order quantities, shorter order lead times, and quality control procedures such certification of supplier quality, preventative maintenance plans, receiving quality inspections, and supplier selection and evaluation.

2.4.1 Supplier Strategy

The supplier strategy involves the engagement of a select few highly integrated and efficient suppliers for crucial products, ensuring a steady and streamlined supply of materials (Bicheno, 2014). Green and Inman (2006) assert that the supplier strategy encompasses collaborating with a small number of reliable suppliers who furnish a diverse array of materials/products in substantial quantities. This essentially revolves around diminishing the pool of suppliers and components while allocating more resources to the remaining key suppliers. This process involves the identification of strategic suppliers for lean operations. Only suppliers capable of swift turnaround times are integrated into the value chain (Bicheno, 2014). Enterprises should actively encourage suppliers to partake in lean initiatives and motivate them towards undergoing the lean transformation. The supplier strategy empowers businesses to address challenges, share cost savings, and elevate quality objectives within their supplier network, enabling them to cultivate the most fitting and efficient supply channels in the long term (Dun & Bradstreet, 2020).

As stated by Hines (2016), a fundamental approach to integration involves creating a transparent system founded on the exchange of information. For extended partnerships, he underscores the significance of a well-coordinated strategy with suppliers, rooted in a mutual comprehension of end-consumer requirements. This aligns with the viewpoint of Bonavia and Marin (2018), who emphasize that prosperous enterprises must engage in regular communication and data sharing with their suppliers. It is imperative for companies to cultivate an environment of continual process enhancement and establish a framework for the exchange of information within their supplier network.

2.4.2 Quantity Strategy

JIT quantity purchasing strategy ensures that firms work to reduce the need for storage space and inventory levels (Crawford, Blackstone & Cox, 2015). By mandating that parts and components be provided exactly when they are needed for production and not beforehand, the technique reduces the amount of inventory held (Harrison and van Hoek, 2008). Hines (2016) asserts that the JIT quantity purchasing technique enables the lowering of inventory levels and the costs related to inventory keeping. When contrasted with most American manufacturers, Toyota has successfully reduced its inventory to the extent that its inventory turnover ratios now exceed 60 times per year. (Crawford, Blackstone & Cox, 2015).

Given that there are fewer stocks coupled with more frequent deliveries and smaller lot sizes, Bane (2002) contends that JIT quantity approach leads to an increase in the amount of data communicated with suppliers. This forces businesses to give suppliers more precise production schedules and information about their operations in order to keep lead times for needed quantities at a high degree of dependability.

2.4.3 Quality Strategy

According to Bonavia and Marin (2018), fewer suppliers are expected to arise as a result of quality improvements made to the necessary goods, services, raw materials, and delivery procedures. Productivity and quality have significantly increased because of JIT purchasing, while Ansari and Modarress (2013) note that these improvements vary depending on the time after adoption. By reducing the number of suppliers, the product quantity for the remaining suppliers will expand, and the buyer will be free to focus on adding value with his suppliers rather than managing them (Bonavia and Marin, 2018).

Applying quality strategy results in increased levels of quality and productivity as well as better customer responsiveness according to a number of studies (Mutegi, 2018). According to Bane (2002), the impact on quality purchasing strategy improves the company's competitiveness. The effects of quality purchasing as a strategy are crucial for the entire supply chain and in addition to manufacturing. Sriparavastu and Gupta (2017 points out that quality purchasing strategy can result in 200-500 percent improvement in quality and the human effort is also substantially reduced by 50 percent together with a similar decrease noted within the manufacturing sector, pertaining investments in tools and the time required for product development. JIT quality purchasing consists of a number of management techniques that prioritize quality, supplier management, and waste reduction using such techniques (Fawcett & Pearson, 2011).

2.4.4 Shipment Strategy

In many businesses, JIT production has developed as a result of JIT delivery (Hines, 2006). The concept has been broadened and now refers to postponement of unnecessary resources until they are required. JIT delivery also needs regular, quick transfers of information and items along the value chain. (Bonavia and Marin, 2018). According to Villarrel, Garcia and Rosas (2009), JIT delivery, when applied, yields important benefits for an organization. In most of the transportation or delivery networks, JIT delivery leads to significant waste elimination and reduced unnecessary costs. JIT transportation has been recognized by manufacturing firms as the value it adds has established it as one of the differentiating factors in the global market.

Golhar, Stamm, and Smith (2015) claim that JIT delivery can aid in reducing lead times, which in turn can boost shipment frequency and decrease order sizes. According to Hines (2006), the JIT methodology offers significantly shorter delivery lead times than conventional purchasing methods. The capacity to swiftly adapt to shifts in the environment, facilitated by flexibility, provides manufacturing firms with a unique and advantageous edge in competition. Additionally, flexibility serves to reduce confusion within the manufacturing facility (Hines, 2006). In the context of Just-in-Time (JIT) systems, there is generally a significantly improved level of reliability in lead times. This implies higher standards of customer service and reduced requirements for maintaining safety stock within the organization. A decrease in the volume of safety stock significantly diminishes the company's reliance on working capital. (Hines, 2006).

In order to better understand how JIT transportation affects an organization's operational effectiveness, Taylor (2006) developed four JIT transportation or delivery laws. These rules encompass the laws of managing everyday events, waste in transportation, performance in transportation, and strategy in transportation. Hines and Taylor (2000) Suggested a framework consisting of four broad phases, starting with aligning with the company's strategic objectives, followed by pinpointing wastage, formulating strategy alternatives and making a choice, and ultimately executing and overseeing the plan. They suggested adopting a JIT methodology for eliminating waste in the transportation process.

2.5 Empirical Review

In the United States of America, Kaynak (2002) investigated the connection between just-in-time purchasing strategies and corporate performance. In this study, 214 US-based companies made up the sample. To test the hypothesis, structural equation modeling was employed. The study found a direct and positive correlation between just-in-time purchasing strategies and corporate success. However, because this study was carried out in a wealthy nation, it is important to determine whether Kenya, a poor nation, can attain the same outcomes.

Holliday and Yep (2005) undertook a research regarding China’s E-government public administration, they observed that the implementation of e-government seeks to efficiently and cost-effectively distribute information, improve the delivery of public services, and facilitate citizen participation in governance. According to the findings of the study, e-governance was an active form rather than a term or an event related to technology. The researchers, however, focused on the E-government context of lean practice and confined their scope, failing to provide JIT techniques with a holistic perspective and examine how it impacts operational performance.

Kinyua (2015) sought out to establish the JIT procurement system on organization performance in the context of Corn Products Kenya Limited. The results of this descriptive study revealed that JIT procurement improved organizational performance. (ROI), adherence to the (TQM) principle of zero defects, decreased double handling of items, and cost savings on stored capital that could be redirected towards other operational endeavors were some of the findings. One significant drawback of this study is that it only examined Corn Products Limited, one manufacturing company, rather than all the Kenyan food and beverage manufacturing companies.

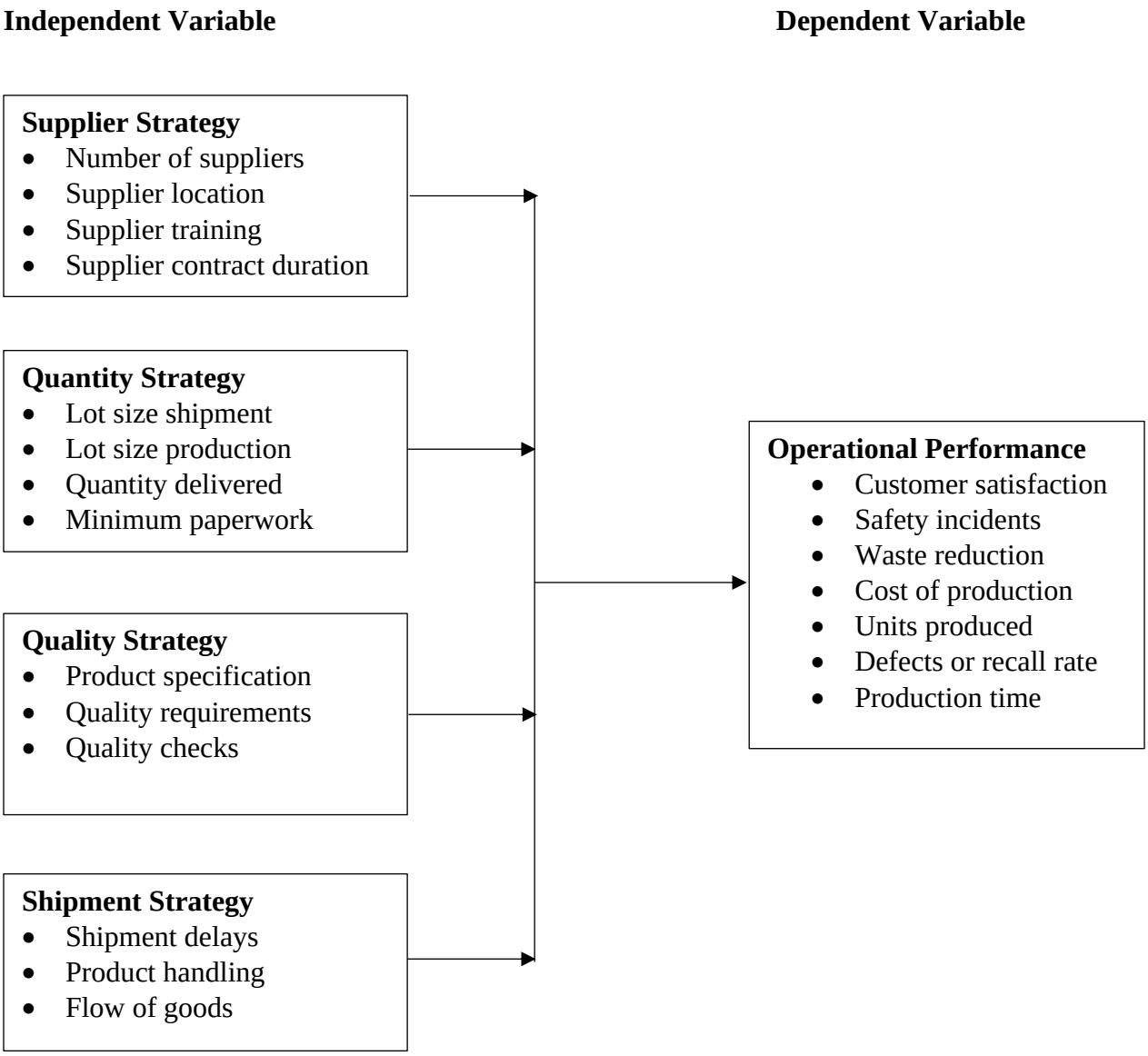
Mutua (2015) did a study on the organizational performance and lean supply chain management techniques used by big Kenyan industrial companies. Employed in the study was a descriptive research approach and questionnaires to gather its data with 655 significant Kenyan manufacturing firms as the target market. The study came to the conclusion that adopting lean procurement techniques enhanced organizational performance. Instead of focusing primarily on food and beverage production companies in Nairobi County, this study concentrated on large-scale manufacturing research gap that will be addressed in this study.

Keitany and Riwo-Abudho (2014) undertook a study to ascertain the effects of lean production on organizational performance of a flour producing company in Nakuru, Kenya. Lean production was shown to be more effective when management styles were improved, all personnel at various hierarchical levels were involved, and better inventory management strategies were used. Furthermore, their research revealed favorable relationships between material management and physical distribution, which made them important predictors of an organization's ability to implement lean production practices. The study only focused on businesses that produced flour which forms the research gap.

2.6 Conceptual Framework

The framework portrays a relationship that exists between the dependent variable and the independent variable.

Figure 2. 1: Conceptual Framework



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, we delve into the research design, methods for selecting samples, and techniques for obtaining data, approaches to analysis of data, diagnostic tests, the analytical framework, tests of statistical significance, and the target population.

3.2 Research Design

The study utilized a descriptive research design which portrays the circumstance as it exists (Kothari, 2004). Additionally, Creswell (1994) adds that the main goal of descriptive research is to provide details on a demographics' or phenomenon's characteristics. Descriptive research designs was also used to describe the central tendency of every because they give a concise summary and some useful pointers as to which variables should be tested quantitatively (Kothari, 2004). As such the design was relevant in establishing the effect of JIT purchasing strategies on the operational performance of manufacturing firms in Nairobi County.

3.3 Population of the Study

Population refers to a group of objects or individuals with similar attributes to be studied. This study used a target population of 149 manufacturing firms derived from the manufacturing firms within Nairobi County Metropolitan area as per the KAM 2020 register (See Appendix III)

3.4 Data Collection

The research incorporated primary and secondary data sources. Data collection involved the utilization of a survey instrument in the form of a questionnaire, which encompassed a combination of open and closed-ended questions. The inclusion of questions that were open ended served the purpose of allowing the researcher to acquire qualitative insights into the perspectives of the respondents on JIT purchasing strategies in manufacturing firms in Nairobi County, Kenya, meanwhile, closed-ended questions were employed to facilitate the collection of quantitative data, which will be analyzed by employing Likert-scale. Mgenda and Mgenda (2003) assert that questionnaires can be used to gather vital data on the respondents. According to Orodho (2004), this approach reaches many subjects who can read and write on their own.

3.5 Validity and Reliability of the Instrument

Study reliability is factored on the trustworthiness and accuracy of research instruments as well as the validity referring to the ability of a research tool to assess what it was envisioned to assess and the degree to which it can achieve this (Bryman, 2003). When an instrument is able to produce comparable results after being used on numerous trials, it is said to be reliable. Thus when the research instruments are provided in a sensible order, with acceptable question structuring and the right language, the validity and reliability are assured (Crotty, 1998).

In conclusion, instrument validity examines whether it accurately assesses whether it gauges its intended aspects or the precision of the outcomes. The probability test was utilized in the study as a validity indicator. The research extensively examined the research instrument and made sure it produced the data necessary to support its validity using the research supervisor as an expert. A Cronbach-Alpha reliability test was used in the study, and an instrument was considered reliable if it had a coefficient of 0.7 or above.

3.6 Data Analysis

Before conducting the ultimate analysis, the acquired data underwent a thorough review for precision, consistency, uniformity, and comprehensiveness. It was then structured to streamline the process of coding and tabulation with the assistance of Excel software. The data was subsequently subjected to descriptive statistical analysis using SPSS, and the results were illustrated through pie charts percentages and tables in order to convey the findings effectively.

Regression analysis was employed to explore the correlation between (JIT) procurement approaches and operational performance. To unveil the expected associations and multiple regression analysis was employed. The multiple regression analysis was executed with a confidence level of 95%. It produced predictive equations for the dependent variable's magnitude and provided values for the predictor variables.

The general model was:

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

Where:

Y = Operational Performance

X_1 = Supplier Strategy

X_2 = Quantity Strategy

X_3= Quality Strategy

X_4= Shipment Strategy

β_0 = Constant

β_1, β_2, $\beta 3$ and β_4= coefficients

$\boldsymbol{\varepsilon}$ = error

CHAPTER FOUR: STUDY FINDINGS AND DISCUSSIONS

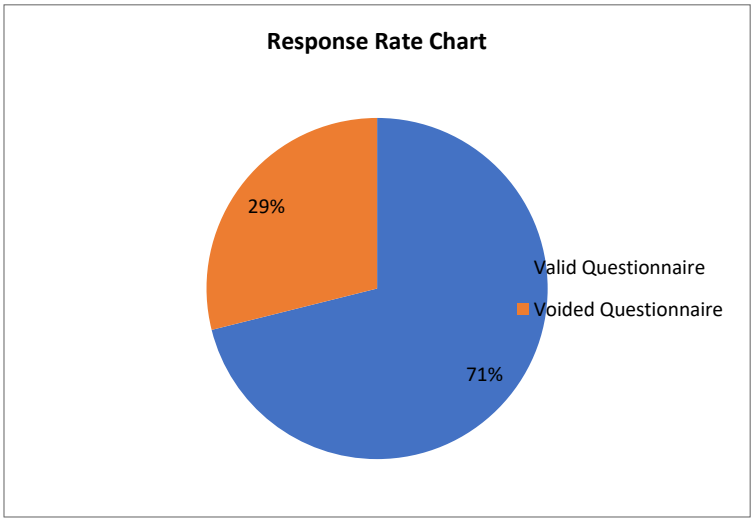
4.1 Introduction

This section encompasses the data analysis required to attain the study's objectives. Before delving into the data analysis, this section establishes the response rate and conducts a reliability test. It encompasses descriptive, correlation, and regression analyses, a discussion of the findings follows and a concluding chapter summary.

4.2 Response Rate

This figure displays the proportion of survey participants who successfully filled out the survey in relation to the total sample size. The sample consisted of 149 individuals, and the researcher successfully gathered 106 fully completed questionnaires from the participants. This amounted to a response rate of 71.1%, which was deemed satisfactory for the study (Creswell, 2002).

Figure 4. 1: Response Rate



4.3 Reliability Test

The Cronbach's alpha coefficient is employed to gauge the internal consistency or dependability of a group of survey items, serving to ascertain whether these items consistently evaluate the same characteristic (Tavakol & Dennick, 2011). It quantifies the extent of consensus on a standardized scale from 0 to 1, where higher scores signify stronger concurrence among the items. Elevated Cronbach's alpha values indicate that the responses to a set of questions from diverse individuals exhibit reliability. In contrast, lower values imply that the set of items may not consistently measure the same underlying concept.

Table 4. 1: Reliability Statistics

Variable	Cronbach's Alpha	N of Items
Operational performance	.734	10
Supplier Strategy	.751	4
Quantity Strategy	.699	4
Quality Strategy	.726	4
Shipment Strategy	.771	3

4.4 Just-in-Time (JIT) Purchasing Strategies and Operational Performance

This section presents the descriptive analysis for JIT purchasing strategies and the operational performance of manufacturing firms within Nairobi County. These strategies include supplier strategy, quantity strategy, quality strategy and shipment strategy. Descriptive statistics defines variables in form of mean, medium, mode, standard deviation, maximum and minimum value obtained from all the responses on every response of the question from the questionnaire.

4.4.1 Operational Performance

Table 4. 2: Operational Performance

	N	Minimum	Maximum	Mean	Std. Deviation
The firm holds less inventory	106	1	5	3.36	1.281
The firm produces in small lots according to orders	106	1	5	3.79	1.093
The firm reduces its process times	106	1	5	4.13	.829
The firm has reduced production defects and recall rates	106	1	5	4.14	.844
The firm has reduced waste	106	1	5	4.21	.727
The firm quickly delivers to its customers	106	2	5	4.25	.814
The firm understands customers' feedback	106	2	5	4.29	.617
Customers are satisfied with the services and products of the firm	106	2	5	4.31	.638
The firm orders high quality materials	106	2	5	4.33	.658
The firm has less safety incidents from its employees	106	2	5	4.41	.629
Valid N (listwise)	106				

The overall performance of operational performance of manufacturing firms is moderate according to the responses, given that the overall mean ranges from 3.36 to 4. 41 and overall standard deviation ranging from 0.629 to 1.281 indicating that most responses were above neutral which was represented by 3. A standard deviation of 0.629 indicates that the disparity of the responses from the mean was small and therefore most responses fell between 3 and 5. This indicates that the operational performance of the study population is above average, attributing to JIT purchasing strategies that have been put in place. JIT purchasing strategies has greatly enhanced the efficiency of the operations in the manufacturing firms within Nairobi County. The statement that was rated highly which is the firm has less safety incidents from its employees had a mean of 4.41 and a standard deviation of 0.629 indicating that the firms have put safety measures in place to ensure that while their employees are executing their duties, they are free from harm which can distract their performance. A standard deviation of 0.629 indicates a small disparity from the mean therefore the majority of responses were between 3 and 5 indicating that the firms have invested in safety measures to protect their employees. The statement that had the least mean of 3.36 and a standard deviation of 1.281 which is the firm holds less inventory indicates that responses on this statement deviated more compared to other statements and the majority of the responses were below the neutral meaning that most respondents did not agree with the statement that firms hold less inventory. This indicates that some firms do not consider having less inventory as a factor in enhancing operational performance.

4.4.2 Supplier Strategy

Table 4. 3: Supplier Strategy

	N	Minimum	Maximum	Mean	Std. Deviation
The firm selects the specific suppliers	106	1	5	4.29	.862
The firm is located close to its supplies	106	1	5	3.50	1.173
The firm conducts regular training with its suppliers	106	1	5	3.00	1.187
The firm has long term contracts with our suppliers for repeat businesses	106	2	5	4.28	.778
Valid N (listwise)	106				

The performance of the responses given depending on the level of agreement in regard to the statements given on supplier strategy was above average indicated by the average mean ranging from 3.00 - 4.29 and standard deviation ranging from 0.778 to 1.187. The statement that was poorly performed was the firm conducts regular training with its suppliers meaning that the majority of responses disagreed with the statement. This indicates that majority of firms do not conduct regular training with their suppliers. Majority of the responses agreed with the statements that the firms select specific suppliers and long-term contracts with their suppliers for repeat businesses which were indicated by a means of 4.29 and 4.28 respectively. Their respective standard deviations were 0.862 and 0.778 suggesting that the deviation of the responses from the means were small which insinuates that most haves have established long term contracts with their suppliers for repeat business and majority of the firms select specific suppliers.

4.4.3 Quantity Strategy

Table 4. 4: Quantity Strategy

	N	Minimum	Maximum	Mean	Std. Deviation
There are frequent small lot deliveries from our suppliers	106	1	5	3.44	1.266
The firm's suppliers deliver exact quantities	106	2	5	4.29	.780
The firm orders in small lots from certified suppliers	106	1	5	3.69	1.222
There is minimum paperwork with our suppliers	106	1	5	3.78	1.195
Valid N (listwise)	106				

The average mean ranges between 3.44 and 4.29 and standard deviation ranging from 0.780 to 1.266, indicating that majority of responses agreed with the statements provided in relation to quantity strategy and most responses are close to the mean indicating that most firms adopt quantity strategies. Majority agreed with the statement on delivering exact quantity showing that most firms receive exact quantities from their suppliers since the statement had a mean of 4.26 and a standard deviation of 0.780 indicating that majority of responses were above neutral hence they conquered with the statement. The standard deviation (1.266) and a mean of 3.44, which is the least, of the statement on the frequency of small lot deliveries from the firms'

suppliers indicates that most responses deviated from the mean which revealed that few firms have frequent small lots deliveries from their suppliers while a good number does not.

4.4.4 Quality Strategy

Table 4. 5: Quality Strategy

	N	Minimum	Maximum	Mean	Std. Deviation
There are minimum product specifications imposed on our suppliers	106	1	5	4.13	.916
The firm helps suppliers to meet quality requirements	106	1	5	3.91	1.091
The firm encourages suppliers to use quality check techniques	106	2	5	4.21	.813
Our firm has invested in quality related information systems	106	1	5	4.19	.967
Valid N (listwise)	106				

The adoption of quality strategies is evidenced across the manufacturing firms as indicated by high means with the average mean ranging from 3.91 to 4.21 and the standard deviation ranging from 0.813 to 1.091. This indicates that the majority of responses agreed with the statements showing a high level of quality strategies adoption among the firms. The statement that was strongly supported was that the firm encourages the suppliers to use quality check techniques which had a mean of 4.21 and a standard deviation of 0.813 indicating the use of quality check techniques among the manufacturing firm within Nairobi. The statement with the least favorable rating was about the firm helping the suppliers to meet quality requirement indicating that a good number did not agree with the statement because it is less practiced in their firms. This statement had the lowest mean of 3.91 and the highest standard deviation of 1.091. This indicates that some firms are reluctant to adopt this strategy while on the other side other firms have adopted the strategy to improve on quality.

4.4.5 Shipment Strategy

Table 4. 6: Shipment Strategy

	N	Minimum	Maximum	Mean	Std. Deviation
Shipment times are short in order to avoid delays	106	2	5	4.26	.796
There is good product handling during product shipments	106	2	5	4.32	.750
There is smooth flow of goods for products to be shipped on time	106	1	5	4.17	.931
Valid N (listwise)	106				

The responses in regard to shipment strategy had high rating indicating that almost every manufacturing firm within Nairobi County adopts shipment strategy. All the statements had achieved a mean of 4 and above indicating that majority of the response agreed with the statements. The standard deviations also are below 1 indicating that most responses were close to the mean indicating that the variation of the adoption of shipment strategies is small since many firms ensure that shipment efficiency is maintained.

4.5 Just-in-Time (JIT) Purchasing Strategies and Operational Performance

Correlation analysis is employed to establish the relationship between individual independent variables and the dependent variable. In this study, Spearman's rank correlation was selected due to its nonparametric nature. Correlation is quantified on a scale ranging from 0 to 1, where 1 signifies a perfect correlation, and 0 denotes no correlation.

Table 4. 7: Correlations

		Operational Performance	Supplier Strategy	Quantity Strategy	Quality Strategy	Shipment Strategy
Operational Performance	Pearson Correlation	1	.144	.148	.463**	.603**
	Sig. (2-tailed)		.140	.131	.000	.000
	N	106	106	106	106	106
Supplier Strategy	Pearson Correlation		1	.340**	.291**	.215*
	Sig. (2-tailed)			.000	.002	.027
	N			106	106	106
Quantity Strategy	Pearson Correlation			1	.234*	.120
	Sig. (2-tailed)				.016	.221
	N				106	106
Quality Strategy	Pearson Correlation				1	.596**
	Sig. (2-tailed)					.000
	N					106
Shipment Strategy	Pearson Correlation					1
	Sig. (2-tailed)					
	N					106
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

The research establishes a correlation between the independent and dependent variables. It was observed that the supplier strategy exhibited a slight, positive, and statistically insignificant correlation of 0.144 with operational performance.Quantity strategy indicated positive and insignificant weak correlation of 0.148 with operational performance. Quality strategy indicated a positively strong significant correlation of 0.463 with the operational performance. Shipment strategy as well revealed a strong significant and positive correlation of 0.603 with the operational performance. The research pinpointed that an increaase in any independent factor will cause a corresponding increase in the dependent variable, and conversely, a decrease in an independent factor will result to a decrease in the dependent variable.

4.6 Just-in-Time (JIT) Purchasing Strategies and Operational Performance

Interrelation between JIT purchasing strategies and operational performance is determined through regression analysis. Using it determines if the relationship between the study variables is significant. As a result, multiple linear regression, where significance was determined by the F-test, was adopted.

4.6.1 Regression Summary of the Model

The model's regression summary presents findings that demonstrates the model's effectiveness, as reflected in the R-squared value. This metric gauges how effectively the selected model in the study elaborates variations in the dependent factor. Conversely, R-squared adjustement modifies these statistics in consideration of the number of independent variables included in the model.

Table 4. 8: Model Summary

Model	R	R-Squared	Adjusted R-Squared	Std. Error of the Estimate
1	.619[a]	.383	.359	3.243
a. Predictors: (Constant), X4 = Shipment Strategy, X2 = Quantity Strategy, X1 = Supplier Strategy, X3 = Quality Strategy				

The study's independent variables may account for variations in operational performance (Y) to the tune of 38.3%, according to the study's coefficient of determination of 0.383. Other variables outside the model account for the remaining variations in Y (61.7%). The adjusted determination of coefficient which considers the number of variables in a data set according to the study is 0.359, which is slightly below $R^{2.}$

4.6.2 Analysis of Variance

Substantial correlation between the independent and dependent variables can be found through the analysis of variance. This is achieved by employing the F-test, in which the significance p-value is compared to a predefined alpha threshold of 0.05.

If the p-value is less than 0.05 the null hypothesis is rejected, and draws a conclusion that the independent and dependent variables are significantly related, if the p-value is greater than 0.05, the study accepts the null hypothesis, and consequently, it concludes that the independent and the dependent variable are not significantly related.

Table 4. 9: Anova Table

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	659.827	4	164.957	15.685	.000[b]
	Residual	1062.182	101	10.517		
	Total	1722.009	105			
a. Dependent Variable: Y = Operational Performance						
b. Predictors: (Constant), X4 = Shipment Strategy, X2 = Quantity Strategy, X1 = Supplier Strategy, X3 = Quality Strategy						

The study rejects the null hypothesis and concludes that JIT purchasing strategies have a significant effect on operational performance of the study population since Table 4.9 shows a p-value less than 0.05.

4.6.3 Regression Coefficient

When all other variables are maintained constant, the regression coefficient estimates the likelihood that changes in one independent factor will result in changes in the dependent factor.

Table 4. 10: Regression Coefficient Table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.338	3.092		6.901	.000
	X1 = Supplier Strategy	-.050	.139	-.031	-.362	.718
	X2 = Quantity Strategy	.101	.139	.061	.727	.469
	X3 = Quality Strategy	.282	.186	.153	1.517	.132
	X4 = Shipment Strategy	1.134	.217	.511	5.237	.000

Dependent Variable: Y = Operational Performance

From Table 4.10, the regression coefficients suggest that regression model be transformed to:

$Y = 21.338 + 1.134X4 + 3.092$

According to the model, increasing supplier strategy by one unit, with all other factors maintained at their current levels, would cause an insignificant reduction in operational performance by 0.50%, whereas increasing quantity strategy by one unit, with all other factors constant, would effect an insignificant improvement on operational performance of 0.101%. Holding all other variables fixed, increasing quality strategy by one unit would result in a 0.282% insignificant improvement in operational performance. However, the model suggests that increasing shipment strategy by one unit, with all other factors maintained constant, results in a significant improvement of 1.134% on operational performance.

4.7 Discussion of Findings

A number of findings, all of which will be summed up, interpreted, and explained, came up from the study. Initial summarization of the gathered data for each study variable was done through descriptive statistics. Data from all responses collected from administration of the questionnaires showed that the mean operational performance was 4.122 taken from averaging

the statements means. A rating of 4 indicates most of the responses conquered with the statements provided to assess the level of operational performance. This indicates that the operational performance of most manufacturing firms within Nairobi County is above average. The mean as well indicates that operational performance is good but not excellent, and therefore the firms are required to adopt effective strategies to improve the efficiency of their operations. Supplier strategy registered a mean of 3.77 which was above neutral, represented by 3. This indicates that most firms adopt supplier strategy in their operations although the study cannot overlook some firms which do not use supplier strategy who disagreed with the statements on supplier strategy. Quantity strategy registered a mean of 3.8, quality strategy registered a mean of 4.11, and shipment strategy registered a mean of 4.25. From these means, shipment strategy, amongst the four strategies, is the most highly adopted by manufacturing firms within Nairobi, followed by quality strategy and quantity strategy, and finally supplier strategy. Using the descriptive statistic on the findings populated by this study, operational performance can therefore be attributed to these four strategies.

Correlation analysis that was undertaken indicates that both supplier strategy and quantity strategy, independent factors, had insignificant correlation against operational performance while quality strategy and shipment strategy factors had significant impact on operational performance. Both quality strategy and shipment strategy indicated positive strong and significant correlation against operational performance while both supplier strategy and quantity strategy revealed a weak positive correlation. The findings of the correlation analysis of the independent factors and the dependent factor implies that increase in JIT purchasing strategies results to an increase in operational strategies. Moreover a decrease in JIT purchasing strategies will result to a decrease in operational performance.

The regression analysis on the other hand indicated that all the independent factors (variables) had an effect on operational performance. Quantity strategy, quality strategy and shipment strategy had a positive impact on operational performance pinpointing that an increase of a unit in any of the independent variable while others remain constant will result to a substantial increase in the operational performance the dependent variable, by 0.101, 0.282 and 1.134 respectively. The regression analysis however indicated that supplier strategy negatively affects operational strategy and therefore an increase of a supplier strategy will result to a decrease in operational strategy by 0.50 units. This implies that adoption of supplier strategies should be avoided by manufacturing firms since it negatively affects the operational performance of the firm. The regression model established by the study explains 38.3% of the change in operational

performance given by the R Square of 0.383. This pinpoints that JIT purchasing strategies identified by the study can only influence a change of 38.3% of the operational performance and the rest 61.7% is explained by other factors not discussed by the study.

4.8 Summary and Interpretation of Results

The structure of the questionnaire served as a proper guide for the study, focusing on operational performance of manufacturing firms in Nairobi County, Kenya, and JIT purchasing techniques. Supplier strategy, quantity strategy, quality strategy, and shipment strategy made up the JIT purchasing strategies – the independent variables. The dependent variable was the Operational performance. To ascertain how the study variables related to one another, inferential statistics through correlation and regression analyses was used.

Findings from this study agree with a study done by Kaynak (2002) who looked into the relationship between (JTI) purchasing methods and corporate performance in the (USA). The findings indicated a direct and positive correlation between just-in-time purchasing strategies and corporate success. Current study findings correspond to Kinyua (2015) study in the context of Corn Products Kenya Limited, intending to ascertain (JIT) purchasing system impact on organizational performance. Procurement of (JTI) enhanced organizational performance, according to the findings. There were several findings; increased (ROI), adherence to (TQM) ideal of zero defects, a reduction in double handling of things, and cost savings from not having to store money that might be utilized for other business activities.

Findings from this study were similar to those of Mutua (2015) who undertook a study on the organizational effectiveness and lean chain supply management practices employed by significant industrial businesses in Kenya, which indicated a positive impact of lean management of supply chain practices on firm's effectiveness. Adopting lean procurement strategies improved organizational performance, as per study findings. Similar, the finding of the current study concurred with Keitany and Riwo-Abudho (2014) findings, of a research on how lean production affects the firm's performance of a flour manufacturing business in Nakuru, Kenya. The study identified that when management practices were changed, all personnel at different hierarchical levels were involved and better inventory management techniques were employed, lean manufacturing was found to be more effective. Additionally, their research found positive correlations between material management and physical distribution, making them crucial indicators of an organization's capacity to adopt lean manufacturing techniques.

The study findings however, contradicted with those from studies done by Kaynak (2002), Kinyua (2015), Mutua (2015), Keitany and Riwo-Abudho (2014) who used different strategies from the ones used in this current study, and found out that there was a positive correlation between all just-in-time purchasing strategies and performance, unlike in the current study which established a negative impact by supplier strategy on operational performance. This study and its findings on supplier strategy demonstrate that not all JIT purchasing strategies can be adopted without assessing their impact on performance since some may have negative impact.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter includes an overview of the study, an in-depth analysis of the study's findings and outcomes, its conclusion, and extensive recommendations for JIT purchasing strategies and operational organization performance. Therefore, the chapter applies the study's conclusions to organizational day-to-day operations across the board, not only their relevance to manufacturing enterprises. Therefore, the study bases its logical recommendations on the inferences that are drawn from the findings of this study.

5.2 Summary of the Study

Descriptive analysis was used to identify the JIT purchasing strategies that are commonly employed by manufacturing firms within Nairobi County in Kenya and ascertain the mean for each strategy in order to determine the most to least common ones. Supplier strategy had a mean of 3.77 implying that more than half of the firms included in the study have adopted this strategy. Quantity strategy had an average mean of 3.8 suggesting that more than half of the firms adopt this strategy in their firm. The results indicate that more firms adopt quantity strategy as compared to supplier strategy. Quality strategy with a 4.11 implied that more than three quarters of the firms adopt quality strategy in their operations. It indicates that majority of the firm embrace quality strategies more than supplier and quantity strategies. Lastly, shipment strategy with the greatest mean at 4.25 indicated it is the most commonly used JIT strategy among the population of the study.

Both correlation and regression analyses were employed to measure how much of an effect JIT purchasing strategies have on operational performance of the study population. Correlation analysis, taken at 95% level of confidence, established a positively weak insignificant correlation between supplier strategy and operational performance at 0.144, and between quantity strategy and operational performance at 0.148. Quality strategy indicated a positively strong insignificant correlation with operation performance of 0.463, while shipment strategy indicated a positively strong significant correlation with operational performance of 0. 603. This implies that these strategies have an effect on operational performance, thereby a change applied in them will effect a change in operational performance.

Regression analysis established how much operational performance of the study population is affected by JIT purchasing strategies. In the findings the study identified that the model's utilization explained 38.3% of the observed variations on operational performance indicating that the other factors that are not covered by the study influence 61.7% of operational performance. Supplier strategy had a negative effect of 0.050 on operational performance, quantity strategy had appositive effect of 0.101 on operational performance, quality strategy had a positive impact of 0.282 on operational performance and lastly shipment strategy had a positive impact of 1.134 on operational performance. This indicates that adopting supplier strategies will increase the operational cost more than it can enhance operational performance while adopting quantity, quality and shipment strategies will lead to a positive effect on operational performance.

5.3 Conclusion of the Study

Based on the findings drawn from the study, the following conclusions were made regarding JIT purchasing strategies.

5.3.1 Just-in-Time Purchasing Strategies Commonly Used by Manufacturing Firms in Nairobi County, Kenya

From the study, shipment strategy was the most adopted just-in-time purchasing strategy, followed by quality strategy, quantity strategy and lastly supplier strategy. The shipment strategy is the highest based on its reduction of lead times, handling and storage costs, wastages, and promotes regular and quick deliveries, thus promoting value chain efficiency. The quality strategy is ranked the second most adopted strategy because it involves more effort, time and costs for the manufacturing firm and its suppliers. Nevertheless, it’s a very important since it maintains a product integrity in the marketplace, reduces on waste in the value chain, and increases market competitiveness. The third ranked strategy in adoption is the quantity strategy, understandably from the variability of demand and supply, especially coming from a period of drastically affected supply chains during the past global pandemic. The strategy prescribes a reduction in inventory levels and prompt deliveries, but external factors that are not under the control of manufacturing firms hamper their ability to do so without the risk of backorders and stock-outs, and effectively reducing their performance. The lowest ranked strategy from the study, the supplier strategy, increases the manufacturing firm’s operational cost through training suppliers, identifying & evaluating the best suppliers, locating the manufacturing firm near suppliers as opposed to the market, and maintaining long term contracts with specific

suppliers, thus hindering the possibility of acquiring new improved services and goods from more competitive suppliers.

5.3.2 Influence of Just-in-Time Purchasing Strategies on Operational Performance of Manufacturing Firms in Nairobi County, Kenya

The study found that each of the (JTI) purchasing strategies influence operational performance of manufacturing firms in varying degrees. Specifically, only two of the strategies, namely shipment strategy and quality strategy, have a positive influence on operational performance, while the other two strategies, quantity strategy and supplier strategy, both have a negative influence on operational performance.

5.4 Recommendation of the Study

Inference made from study findings support the importance of just-in-time purchasing strategies towards increasing operational performance within manufacturing industries through lowering production costs, enhancing product quality, accelerating time to market, and increasing operational flexibility. Therefore, for all manufacturing firms can gain from implementing the JIT purchasing strategies. The study advises manufacturing firms to adopt such JIT purchasing strategies, while also urging other businesses to adopt them and reap their advantages. Suppliers to manufacturing companies are recommended to adopt the strategies and promote collaboration with their clients in order to grow their capabilities towards meeting client demands.

Considering that a positive relationship was established between JIT purchasing strategies and operational performance, the findings recommend the government and policymakers to develop policies that enhance adoption of these strategies to spur performance, and consequently economic growth. Policymakers should further consider the findings of the study in adopting procurement policies that ensure quality is developed in time and in right quantities to meet specific needs.

5.5 Limitations of the Study

Although the study was satisfactorily carried out, there were some restrictions. One major limitation was that 29% of the survey respondents failed to return the questionnaires, while others returned them beyond the deadline. Persuading respondents to participate in the survey was difficult too, by virtue of the perceived fear of submitted responses falling into the hands of the competitors and affecting their market control. Understandably, the respondents required

assurance from the researcher on the collected data being solely for academic use that will not presented beyond that purview. Despite the university having a set duration for completion of the project, it turned out to be insufficient because of the research requiring more time to fully address it.

In addition, since only 38.3% of operational performance could accurately be attributed to the variables of this study, that leaves a 61.7% effect on operational performance that was beyond the study. Forecasting operational performance using the employed study variables is therefore limiting and requires additional ones to create a larger influence on the model and determining coefficients.

Lastly, because of proximity and ease of data collection, the respondents were limited to manufacturing companies in Nairobi County. All Kenyan manufacturing firms, including private ones, should be included in the study, in order to gather more insights on how their operational performance is impacted by JIT purchasing practices.

5.6 Areas for Further Research

Per the findings of this study, a similar study is recommended using secondary data and not primary data. Doing so will work around the challenge in primary data collection, which might be biased based on respondents opting to respond to questions on the likely answers that would be needed, rather than describing the actual situation. Secondary data such as company reports, audited book of accounts and other published company data would be used to ascertain the JIT purchasing strategies and organizational performance of Kenya's manufacturing firms.

A similar study would also be recommended where data could be obtained from other manufacturing firms outside of Nairobi County. A study in the East Africa region would provide details on how manufacturing firms in other East African countries would respond to JIT purchasing systems and their operational performance.

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APPENDICES

Appendix I: Introduction Letter

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Our Ref: **D67/33243/2019** July 18, 2022

National Commission for Science, Technology and Innovation
NACOSTI Headquarters
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P. O. Box 30623- 00100
NAIROBI

RE: **INTRODUCTION LETTER: DENNIS MUTETI**

The above named is a registered Master of Science in Supply Chain Management candidate at the University of Nairobi, Faculty of Business and Management Sciences. He is conducting research on ***"Just-in-Time Purchasing Strategies and Operational Performance of Manufacturing Firms in Nairobi County, Kenya."***

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the Project.

The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your co-operation will be highly appreciated.

FOR

Dean's Office University of Nairobi Faculty of Business and Management Science

PROF. JAMES NJIHIA
FDEAN, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES

JN/pgr

Appendix II: Questionnaire

Section A: Demographic Data of Respondents

Company Name:

1) Gender: Male [ ] Female [ ]
2) Age (years): 20 – 29 [ ] 30 – 39 [ ] 40– 49 [ ] 50 and over [ ]
3) Education: Diploma [ ] Bachelors [ ] Masters [ ] PhD [ ]
4) Department: Management [ ] Procurement [ ] Production [ ]
5) Experience (years): Less than 2 [ ] 2 – 5 [ ] 6 – 10 [ ] Over 10 [ ]

Section B: This section examines implementation of JIT purchasing strategies and operational performance. Kindly rate each statement using the following Likert scale:

(**1**) Strongly disagree, (**2**) Disagree, (**3**) Neither agree nor disagree, (**4**) Agree, (**5**) Strongly agree

Supplier Strategy

The firm selects the specific suppliers	**1**	**2**	**3**	**4**	**5**
The firm is located close to its supplies	**1**	**2**	**3**	**4**	**5**
The firm conducts regular training with its suppliers	**1**	**2**	**3**	**4**	**5**
The firm has long term contracts with our suppliers for repeat businesses	**1**	**2**	**3**	**4**	**5**

Quantity Strategy

There are frequent small lot deliveries from our suppliers	**1**	**2**	**3**	**4**	**5**
The firm's suppliers deliver exact quantities	**1**	**2**	**3**	**4**	**5**
The firm orders in small lots from certified suppliers	**1**	**2**	**3**	**4**	**5**
There is minimum paperwork with our suppliers	**1**	**2**	**3**	**4**	**5**

Quality Strategy

There are minimum product specifications imposed on our suppliers	**1**	**2**	**3**	**4**	**5**
The firm helps suppliers to meet quality requirements	**1**	**2**	**3**	**4**	**5**
The firm encourages suppliers to use quality check techniques	**1**	**2**	**3**	**4**	**5**
Our firm has invested in quality related information systems	**1**	**2**	**3**	**4**	**5**

Shipment Strategy

Shipment times are short in order to avoid delays	**1**	**2**	**3**	**4**	**5**
There is good product handling during product shipments	**1**	**2**	**3**	**4**	**5**
There is smooth flow of goods for products to be shipped on time	**1**	**2**	**3**	**4**	**5**

Operational Performance

Customers are satisfied with the services and products of the firm	**1**	**2**	**3**	**4**	**5**
The firm understands customers' feedback	**1**	**2**	**3**	**4**	**5**
The firm quickly delivers to its customers	**1**	**2**	**3**	**4**	**5**
The firm has less safety incidents from its employees	**1**	**2**	**3**	**4**	**5**
The firm orders high quality materials	**1**	**2**	**3**	**4**	**5**
The firm has reduced waste	**1**	**2**	**3**	**4**	**5**
The firm produces in small lots according to orders	**1**	**2**	**3**	**4**	**5**
The firm holds less inventory	**1**	**2**	**3**	**4**	**5**
The firm has reduced production defects and recall rates	**1**	**2**	**3**	**4**	**5**
The firm reduces its process times	**1**	**2**	**3**	**4**	**5**

Appendix III: List of Manufacturing Firms

No.	Name of Manufacturing Company	No.	Name of Manufacturing Company
1	Abu Engineering Ltd	38	Cosmos Limited
2	Acme Container Ltd	39	Creative Fabric World Co Ltd
3	Adhesive Solutions Africa Ltd	40	Creative Innovations Ltd.
4	Africa Kaluworks (Aluware) Division K	41	Crown-Berger (K) Ltd.
5	Africa Oil Kenya B.V	42	Cuma Refrigeration EA Limited
6	African Art Products (East Africa) Ltd	43	Doshi Group of Companies
7	Agni Enterprises Ltd	44	East Africa Glassware Mart Ltd
8	Ali Glaziers Ltd	45	East African Breweries Limited
9	Alpha Dairy Products Ltd	46	East African Cables Ltd.
10	Alpha Fine Foods Ltd	47	Eastern Chemical Industries Ltd
11	Apex Steel Ltd	48	Eco Consult LTD
12	AquaSanTec	49	Ecolab East Africa (K) Ltd
13	Aquva Agencies Ltd -Nairobi	50	Ecotech Ltd
14	Arrow Rubber Stamp Company Ltd.	51	Energy Pak (K) Ltd
15	Artech Agencies Ltd	52	Equatorial Tea Ltd
16	Ashut Quality Products	53	Excel Chemical Ltd.
17	ASL Ltd – HFD	54	Fairdeal Upvc, Aluminium and Glass Ltd
18	Atlas Copco Eastern Africa Ltd	55	Famiar Generating Systems Ltd
19	Beta HealthCare	56	Flexoworld Ltd
20	Bilco Engineering	57	Firestone East Africa Ltd
21	biodeal laboratories ltd	58	furmart furnishers
22	Blowplast Limited	59	Gahir Engineering Works Ltd
23	Blue Ring Products Ltd	60	goldrock international enterprises
24	Bobmil Industries Limited	61	Goods Chemistry Practise & Allied Cert. Corp Ltd
25	Bogani Industries Ltd	62	Guan Candle Making Machine Co.,Ltd.
26	Bosky Industries Ltd	63	Haco Industries Ltd
27	British American Tobacco Kenya Ltd	64	Heluk International Limited
28	C. Dormans Ltd	65	Hills Converters [K] Ltd
29	Central Glass Industries {CGI}	66	Hydraulic Hose & Pipe Manufacturers Ltd
30	Chandaria Industries Limited	67	Imani Workshops
31	Chemplus Holdings LTD	68	JET Chemicals (Kenya) Ltd
32	Chevron Kenya Ltd	69	Kapa Oil Refineries Ltd
33	Chloride Exide Kenya Limited	70	Kenbro Industries
34	Climacento Green Tech Ltd	71	Kenya Electricity Generating Company Limited.
35	Colgate-Palmolive(East Africa) Ltd	72	Kenya Grange Vehicle Industries Ltd
36	Collis F B	73	Kenya Petroleum Refineries Ltd

37	Commrecial Motor Spares Ltd	74	Kenya Power and Lighting Company Ltd
75	Kenya Solar	113	Shade Systems (E.A) Ltd
76	Maweni Limestone Ltd	114	Shadetents And Exquisite Designs
77	Mellech Engineering & Construction Ltd.	115	Shamas Motor Spares
78	Metal Crown Limited	116	Shankan Enterprises Ltd
79	Metsec Ltd.	117	Sigma Engineering Co. Ltd
80	MGS International (K) Ltd	118	Simco Auto Parts Ltd
81	Microsoft East Africa Limited	119	Slumberland Kenya Ltd
82	Mjengo Limited	120	Solarworks East Africa
83	Mohajan Trade International	121	South Hill Motor Spares Ltd
84	Ndugu Transport Co Ltd	122	Stainless Steel Products Ltd
85	New World Stainless Steel Ltd	123	Stamet Products (K) Ltd
86	Njoro Canning Factory Ltd	124	Statpack Industries Limited
87	Octagon Express (kenya) Limited	125	Steel Structures Limited
88	Orbit Chemical Industries Ltd	126	Sudi Chemical Industries Limited
89	Orpower 4, Inc	127	Sunrays Solar Ltd
90	Packaging Industries Ltd	128	Superfit Steelcon Ltd
91	Pelican Signs Ltd	129	Tamoil Africa Holdings Limited
92	Petmix Feed	130	TARPO Industries Limited
93	Platinum Packaging Limited	131	Tenacity Locks Ltd
94	Polythene Industries Ltd	132	The Kensta Group
95	Print Fast Kenya Ltd.	133	Tianjin Haopu Chemical Co. Ltd
96	Protec	134	Top Tank
97	Pudlo Cement Company (PCC)	135	Tripac Chemical Industries Ltd
98	PZ Cussons East Africa Ltd.	136	Unga Farm Care (EA) Ltd
99	Raghad Enterprises	137	Unga Group Ltd.
100	Ramco Printing Works Limited	138	Warren Concrete Ltd
101	Redsea Chemist	139	Wartsila Eastern Africa Ltd
102	Reliable Concrete Works Ltd	140	Welfast Kenya Ltd
103	Renscope Scientific Kenya	141	Welrods Limited
104	Rhino Special Products Ltd	142	Wigglesworth Exporters Ltd
105	Rock Plant Kenya Limited	143	Williamson Power Ltd
106	ROM East Africa Limited	144	Wines Of The World Limited
107	Rosewood Office Systems Ltd	145	Kiesta Industrial Technical Services Ltd
108	Rotam Sub-Saharan Africa	146	Kim-Fay E.A Limited
109	Rupa Cotton Mills EPZ Ltd	147	KingSource Plastic Machinery Co.,Ltd.
110	Rural Electrification Authority	148	Manzil Glass & Hardware Ltd
111	Sameer Group	149	Mather & Platt Kenya Ltd
112	Sanpac Africa Ltd		