INFLUENCE OF PROCUREMENT COST OPTIMIZATION ON PERFORMANCE OF MANUFACTURING FIRMS IN KENYA

Dr. Mwangi Nancy Waithira, PhD.

Full Length Research

ABSTRACT

The purpose of the study was to assess the influence of procurement cost optimization on the performance of manufacturing firms in Kenya. The objective of the study was to establish the influence of procurement cost optimization on performance of manufacturing firms in Kenya. The study focused on the transaction cost analysis theory and theory of constraints and competency theory. The study used cross sectional survey research design. Cross sectional design was justified on grounds that data of different manufacturing firms will be collected at a defined period. The study's target population included supply chain managers in charge of procurement department in manufacturing firms in Nairobi County. The 499 supply chain managers in manufacturing firms were the population for this study. The sample of this study consisted of 222 supply chain managers in manufacturing firms in the Nairobi that were stratified and randomly selected from a list of 499 supply chain managers in manufacturing firms operating in Nairobi in Kenya. This study relied on both primary and secondary data sources. Secondary data was collected for performance of the selected manufacturing firms for the period of between 2012 and 2016. This study utilized a questionnaire on the other hand to collect primary data.

Quantitative techniques were used in analyzing the data. A pilot study was conducted on 22 supply chain managers which constituted 10 per cent of the sampled 222 supply chain managers in manufacturing firms. The study used both descriptive and inferential statistics. Descriptive analyses used included: mean, standard deviation as an additional measure of variance and hence risk, frequencies and percentages, while the inferential statistics used were correlation analysis and regression analysis. The findings revealed that procurement cost optimization in this study was a significant predictor of performance of manufacturing firms in Kenya. This revealed that there is a significant positive relationship between procurement cost optimization and performance of manufacturing firms in Kenya. The study concludes that procurement cost optimization plays a significant role in the performance of the manufacturing firms. The study recommends that manufacturing firms should invest in procurement cost optimization to enhance their performance.

Keywords: **Procurement Cost Optimization, performance of manufacturing firms.**

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INTRODUCTION

As competition in the 1990s intensified and markets became global, so did the challenges associated with getting a product and service to the right place at the right time at the lowest cost (Li, Ragu-Nathan & Rao, 2006). Organizations began to realize that it is not enough to improve efficiencies within an organization, but their whole supply chain has to be made competitive. The understanding and practicing of supply chain management has become an

essential prerequisite for staying competitive in the global race and for enhancing profitably (Li, Ragu-Nathan & Rao, 2006).

Optimization is a systematic effort made to improve profit margins and obtain the best results under given circumstances or situations. The cost optimization is a process that should be carried out throughout the construction period to ensure that the cost of the building is kept within the estimated cost limits (Ehrlenspiel, Kiewert, Lindemann & Hundal, 2007). Business uncertainty will continue to impact organizations, and even a well thought-out cost savings program can prove ineffective in the long run. However, when cost pressures are intense, businesses must overcome the dual challenge of continuously innovating while reducing spend to outperform the competition (McGrath, 2013).

Overcoming these obstacles requires a strategic cost optimization program to strike a balance between cost reduction initiatives and investments needed to generate process efficiencies, improve quality of service, build a stronger value chain, improve skill management and increase customer satisfaction. Further, cost optimization cannot be a one-time strategic initiative. Instead, it should be a guiding principle for managing organizations in the most efficient manner while responding promptly to fluctuations in business conditions (McGrath, 2013).

The supply chain has become a very prominent concern for all organizations as theystrive for better quality and higher customer satisfaction (Chopra & Meindle, 2016). Due to a realization by most firms that maximizing performance of one department or functions may lead to less than optimal performance for the whole firm, it has become critical for firms to manage the entire network of supply to optimize overall performance and become competitive in the long run.

Over time, the procurement function has become an integral part of every firm's competitive success (Cousins, 2007). Performance measurement is a central element in procurement management which cannot be considered in isolation. Planning and control go hand in hand. If the procurement function lacks a clear vision, when procurement outsourcing plans are ill developed and management reporting is absent, systematic performance measurement and evaluation will be difficult if not impossible.

Procurement is a functional group as well as a functional activity and performs many activities to ensure value to the organization such as supplier identification and selection, buying, negotiation and contracting, supply market research, supplier measurement and improvement, and purchasing systems development, this function can also be outsourced instead of the organization having a procurement department of its own (Monczka, Handfield, Giunipero, & Patterson, 2015). Supply management on the other hand oversees and optimizes the process of acquiring inputs from suppliers (purchase), converting those inputs into a finished product (production), and delivering those products or outputs to customers (Caniëls & Gelderman, 2007).

Procurement could focus, opportunistically, on the short-term superiority of bargaining power and extract maximum cost reductions (Nollet & Beaulieu, 2005). Alternatively, recognizing that good supply chain management requires a long-term perspective (Rao Tummala, Phillips, & Johnson, 2006), government procurement could take a more strategic perspective, reflecting its uniqueness from the private sector (Murray, 2001), improving its strategic contribution and meaningful involvement (Johnson & Leenders, 2003) through accelerating the economic growth. Procurement is considered as a strategic player in the value chain as it usually represents one of the largest expense items in a firm's cost structure.

According to Kiplagat (2010), the procurement of goods and services represents the single largest cost item for any given enterprise since each dollar a company earns on the sale of a product; it spends about $0.50-0.60 on goods and services. Further, more capital is spent on the procurement of materials and services to support the business's operations than on all other expense items combined.

PROBLEM STATEMENT

Many manufacturing firms have relocated or restructured their operations, opting to serve the local market through importing from low-cost manufacturing areas such as Egypt therefore resulting in job losses (Nyabiage & Kapchanga, 2014) citing turbulent operating environment and high operating costs. Supply chain management practices contribute 50% to the profitability and performance of any organization (Zhu, Sarkis, Cordeiro & Lai, 2013). KPMG (2014) report also noted that real growth in the manufacturing sector averaged 4.1% p.a. during 2006-2013, which is lower than the average annual growth in overall real GDP of 4.6%. As a result, the manufacturing sector's share in output has declined in recent years. According to the World Bank (2014), sluggish growth in the manufacturing sector is pulling down economic growth in Kenya and is also losing grip on the East Africa Community market where it was dominant, due to inefficiencies and the unpredictable operating environment. The share of manufactured goods imported by EAC from Kenya declined from 9 per cent in 2009 to 7 per cent in 2013 (Orege, 2016).

Efficient human resource plays a significant role in an organization's performance as compared with it financial and technology resources. This is true due to the fact that a resourceful and capable workforce is critical to achieving the overall goals and strategies of a firm (Osei & Ackah, 2015). In order to develop competent workforce managers, need to engage employees in the decision making process and this will provide continuous learning environment where needed skill be obtained. When employees have clear idea in-terms of job expectation and the strategic goals of the firm, task and jobs are designed in line with these set targets (Prasanna & Swarnalatha, 2018).

Studies that have been done in this areas include Kimani (2013) who pointed out that manufacturing companies have faced challenges of dealing with scope global market place and its supply chain while retaining speed and flexibility, elimination of wasted time, effort and materials from all point in the supply chain and meet the needs of customer without

holding more inventories. Oketch (2014) study focused on supply chain performance and performance of manufacturing pharmaceutical firms in Kenya. The author noted that monitoring the supply chain performance measurement could help give a firm competitive edge over the others.

Awino (2011) on the other hand focused on investigation of selected strategy variables on performance of large private manufacturing firms in Kenya. Haron and Arul (2012) study was based on the efficiency performance of manufacturing companies in Kenya. Mwangangi (2016) on the other hand focused on influence of logistics management on performance of manufacturing firms in Kenya. Gichuru, Iravo and Arani (2015) study focused on collaborative supply chain practices on performance of food and beverages companies.

The above studies (Awino, 2011; Haron, & Arul, 2012; Mwangangi, 2016; Gichuru, Iravo & Arani, 2015) demonstrate that research has been conducted on the performance of manufacturing firms in Kenya, however none of the mentioned studies and generally little attention has been given on the role procurement cost optimization on the performance of manufacturing firms in Kenya. Specifically, there is a knowledge gap on the influence of procurement cost optimization on the performance of manufacturing firms in Kenya. Therefore, this study intended to address this knowledge gap.

RESEARCH OBJECTIVES

1. To establish the influence of Strategic sourcing on performance of manufacturing firms in Kenya.
2. To assess the influence of consolidation of suppliers on performance of manufacturing firms in Kenya.
3. To assess the influence of improvement of contract management on performance of manufacturing firms in Kenya

HYPOTHESIS OF THE STUDY

1. There is no significant influence of strategic sourcing on performance of manufacturing firms in Kenya.
2. There is no significant influence of consolidation of suppliers on performance of manufacturing firms in Kenya.
3. There is no significant influence of improvement of contract management on performance of manufacturing firms in Kenya

THEORETICAL REVIEW

Transaction Cost Theory

The theory was developed by Coase (1937). It refers to the cost of providing for some good or service through the market rather than having it provided from within the firm. According

to Coase (1937) article on the "The Problem of Social Cost", transaction costs include search and information costs, bargaining and decision costs and policing and enforcement costs (Williamson, 1979). It observes that market prices govern the relationships between firms but within firm decisions are made on a basis different from maximizing profit subject market prices. Within the firm decisions are made on through entrepreneurial coordination (Allen, 1999).

In order to explain how Transaction cost applies to the critical decision points of purchasing, a further explanation of the activities of the purchasing function is given (Baily, 2005). The main activities of Transaction cost economics are centred within 5 processes, namely category strategy, supplier strategy, quotation supplier selection and negotiation, operative procurement and supplier evaluation. Within the first process the category strategy, the buyer puts equal products into one pool (Schiele 2006) and can then determine a strategy for this pooled group.

For a supplier strategy, one might identify the purchasing volume, and level of dependency on the supplier to create a supplier strategy (Johnston, et al. 2004). For supplier selection and negotiation, one can choose between competitive bidding and negotiation (Papazoglou & Heuvel, 2007). Coming to the operative procurement step, this step assists the supplier to act according to what has been negotiated beforehand. When the supplier is providing the buyer with the component, one can measure performance of the supplier, which can be indicated through quality, costs and service (Papazoglou & Heuvel, 2007).

The company should make a component if transaction costs cannot be kept low, use a hybrid governance approach if asset specificity is high but transaction costs can be kept low through the safeguards provided in the contract, and use the market if the component which has to be supplied has low asset specificity (Williamson, 2008). Coming to the sourcing strategy, whether to use multiple suppliers or a single supplier, one might use the same approach of the human agent as being opportunistic and limitedly rational, as in the make or buy decision (Ellram, Tate & Billington, 2008).

Single sourcing is used when the supplier offers special technology, which can lead to a competitive advantage of the company; however, the relationship has to be safeguarded to ensure a cooperative relationship (Walter, Müller, Helfert & Ritter, 2003). Multiple sourcing can be applied when the component is placed within an unassisted, highly competitive market, mostly not providing any special technology that leads to a competitive advantage (Schwabe, 2013). When creating a supplier portfolio the company pools suppliers with the same activities into one pool, however since there is a difference between special technology suppliers, and suppliers providing low asset specificity, one might differentiate between parts that provide a competitive advantage and parts that do not and therefore pool only suppliers with high asset specificity for components delivering a competitive advantage and pool only suppliers with low asset specificity for suppliers providing components that do not lead to a competitive advantage (Lalkaka, 2006).

Limitation of the Coase-Williamson approach is that comparative statics detract attention from the mechanisms that lead to different possible outcomes. If governance forms tend to minimise transaction costs, it is not clear how this occurs. Are managers to some extent aware of these costs and consciously reduce them? Or are costs reduced through some process of competitive evolutionary selection of the costlier over the less costly firms? With his emphasis on information problems and bounded rationality, Williamson does not suggest that managers have sufficient information. Instead (Williamson, 1975) hints at anevolutionary process of selection, but never develops this argument. If he did, he would have to address the well-established theoretical limitations to an (near) optimal evolutionary process of selection, including frequency effects and other context-dependent outcomes (Winter, 1964; Hodgson, 1996). Also in evolution, context matters.

Theory of Constraints

The theory of constraints (TOC) is an overall management philosophy introduced by Eliyahu M. Goldratt in his 1984 book titled The Goal that is geared to help organizations continually achieve their goals. The theory of constraints (TOC) is a management paradigm that views any manageable system as being limited in achieving more of its goals by a very small number of constraints. There is always at least one constraint, and TOC uses a focusing process to identify the constraint and restructure the rest of the organization around it. TOC adopts the common idiom "a chain is no stronger than its weakest link". This means that processes, organizations, etc., are vulnerable because the weakest person or part can always damage or break them or at least adversely affect the outcome. The theory of constraints is a management philosophy that seeks to increase manufacturing throughput efficiency or system performance measured by sales through the identification of those processes that are constraining the manufacturing system (Goldratt & Goldratt, 2004). Theory of constraints is based on the principle that a chain is only as strong as the weakest link or constraint and to elevate and manage the constraint as necessary (Kairu, 2015). The difficulties in the theory of constraints are: very long lead times, large number of unfulfilled orders or they are executed with much extra effort (overtimes), high level of unnecessary inventories or lack of relevant inventories, wrong materials order, large number of emergency orders and expedition levels, high levels of devolution, lack of key customers engagement, frequent changes or absence of control related to priority orders, which implies on schedule conflicts of the resources (Ceniga & Šukalová, 2014). The theory is founded on the belief that an organization that maximizes the output of every machine will not perform as well as one that ensures optimization of the flow of materials and value created through its operational performance (Sproull, 2012).

Theory of constraints emphasizes focus on effectively managing the capacity and capability of these constraints if they are to improve the operational performance of their organization. This can be achieved by processing firms applying appropriate inventory control systems. Companies have struggled to invest in the technology and organizational structures needed to achieve to-date systems synchronization that enable coordinated inventory flows (Fawcett, Ogden, Magnan, & Cooper, 2006).

The Theory of Constraints methodology proposes that operational performance is dependent on the application of inventory control systems in processing firm (Cox & Schleier, 2010). Theory of constraints is a methodology whose basis is applied to production for the minimization of the inventory. In reality, it is difficult for a firm to forecast with precision the consumption of its specific product at a specific region with sometime prior to production and supply of the same product (Noreen, Smith & Mackey, 1995).

Under Theory of Constraints, performance measurements are based on the principles of throughput, inventory dollar days and operating expenses (Umble, Umble, & Murakami, 2006). Theory of Constraints measurements are based on a simple relationship that highlights the influence of inventory control system on progress toward the operational performance. The proof of effectiveness for any inventory control system is the degree to which it improves operational performance of business firms. For processing firms to ensure that the bottlenecks on their operations run smoothly they have to embrace the use of inventory control systems that can facilitate operational efficiency (Umble, Umble, & Murakami, 2006). This may result in the acquisition of additional capacity or new technology of inventory control systems that lift or break the constraints. Improving the performance of the constraint leads to improvement in the operational performance of the theory of constraints contributes a lot to the building of literature in this study (Bayraktar et a., 2009) the entire system. The processing firms depend on inventory as a resource in their operations.

Boyd and Gupta (2004) in their studies introduced a theoretical model for Theory of Constraints on Manufacturing Resource Planning and Just-In-Time in manufacturing firms; they suggest that a positive relationship between each of the three Constraints principles and ideas can be used to improve operational performance of processing firm in Kenya. Gupta and Boyd (2008) in their research on 'theory of constraints can serve as a general theory in operations' revealed that theory of constraints provides approaches to operations that avoid pitfalls of local optimization by reaching a cross functional boundary in organizations. They also noted that while the theory appears to meet the criteria of a good theory, it has not been empirically tested for the most part. Criticism that has been leveled against theory of constraints includes its sub optimality. Trietsch (2005), argues that the theory is inferior to competing approach

EMPIRICAL LITERATURE REVIEW

Thawiwinyu and Laptaned (2009) focused on the impact of strategic sourcing and E-procurement on supply chain performance management. 40 copies of questionnaire were distributed to cover all of GSK's partners; all of them were answered and gathered. The data collected was analyzed to answer research questions, descriptive statistics, including frequencies, percentages, means and standard deviations, was employed to analyze the data from part of questionnaire. The finding showed that many of today's business accept strategic sourcing as effective initiative in improving purchasing and firm level performance. Ellram (2002) study focused strategic cost management in the supply chain a case of purchasing and supply management perspective. The purpose of this study was to explore best practices in

strategic cost management among leading edge purchasing and supply management (PSM) organizations today.

All of the core organizations studied believe that they have been very successful in supplier cost management, as shown by the significant, documented savings supplier cost management   has contributed to the bottom line of the organization. All reported savings ranging from millions of dollars, to tens of millions of dollars per year, and savings ranging from about 5 percent to over 10 percent in annual expenditures.

Sobhani, Malarvizhi, Al-Mamun and Jeyashree (2013) focused on the strategic procurement and financial performance of Iranian manufacturing companies. The objective of this study was to scrutinize the interrelation between the level of strategic procurement and financial performance of manufacturing companies in Iran. A cross-sectional explanatory study was designed to identify Iranian manufacturing company's procurement management practices and performance outcome. Findings of this study noted a positive relationship between the strategic procurement and financial performance of the companies.

Perumal (2009) focused on the influence of purchasing strategies on manufacturing performance with the moderating effect of purchasing strategic integration. A total of 750 questionnaires been distributed via email to manufacturing firms located in major industrial states at Malaysia and resulted with 158 questionnaires or 21% been returned with complete information to be used for statistical analysis. The analysis result shows that all independent variables except supply base management strategy when integrated with Purchasing Strategic Integration have significant influence on manufacturing performance.

Ngunyi (2014) study focused on the procurement practices and the performance of parastatals in Kenya. The objective of the study was to establish the effects of procurement practices on organizational performance of Parastatals in Kenya. The research adopted a descriptive research design. Data was collected using a self-administered questionnaire that was distributed to 76 senior and middle level managers at the firms. The finding of the study was that procurement is both a driving force to competitive strategy selection and an important resource to achieving improved organizational performance. It was found that if procurement practices are employed effectively, and then is expected to improve firm-customer relationship, preserve the environment, motivate and improve the coordination of staff. One limitation of the study is that the researcher measured only the operational side of procurement and considering the early stages of procurement implementation on the organizations.

Kimantiria, (2014) study focused on the supply chain management practices and competitiveness in the national government of Kenya. The authors assert that a good organized and executed procurement will make it possible for companies to decrease their inventories, have better customer service, and diminish costs as well as aid fast inventory turns. One of the biggest advantages of procurement in the situation of short term objectives

is increasing productivity and decreasing inventory and reducing lead time. Based on long term objectives, this factor has significant role in increasing company's market share and having outside integration of the procurement.

Paulraj, Chen and Flynn (2004) have documented how firms with strategic purchasing are able to foster long term, cooperative relationships and communication, and achieve greater responsiveness to the needs of their suppliers. Although other factors, such as restructuring and governance, and transaction cost economizing are also important for understanding strategic purchasing and its linkage to supply management, they are beyond the scope of this investigation. Strategic purchasing fosters communication, which is critical to achieving effective integration throughout the supply chain.

RESEARCH METHODOLOGY

Research Design

The study adopted a cross sectional survey research design with descriptive approach. Cross sectional design was justified on grounds that data of different manufacturing firms was collected at a defined period (Connaway & Powell, 2010). Eriksson and Kovalainen (2008), research design is a plan that guides the research in the process of collecting, analyzing and interpreting observations; the researcher's blueprint for the methods and instruments used in collecting data and evaluating it, in order to respond to the research questions of the study. Sekaran and Bougie (2016) further observed that descriptive approach is designed to obtain information concerning the current phenomenon and whatever possible to draw valid general conclusions from facts discussed. The design also has enough provision for protection of bias and maximized reliability (Kothari, 2017). In this study, inferential statistics and measures of central, dispersion and distribution were applied in order to analyse the performance of the manufacturing firms.

Target population

Population is generally a large collection of individuals or objects that is the main focus of a scientific query and to whose benefit the study is done (Bernard, 2017). According to Bernard (2017) a research population is a well-defined collection of individuals or objects known to have similar characteristics and usually have a common, binding characteristic or trait. Burns and Grove (2003) describe a target population as the entire aggregation of respondents that meet the designated set of criteria. Parahoo (1999) defines population as the total number of units from which data can be collected such as individuals, artifacts, events or organizations. The target population of the study was 499 supply chain managers in manufacturing firms in Kenya because they are then ones with all information about the firm's procurement processes.

Sampling Frame

The study's target population includes the 499 supply chain managers in manufacturing firms in Nairobi County. According to KAM (2014), there are a total of 499 manufacturing firms operating in Nairobi where 80 per cent of their members are based. The 499 supply chain managers in manufacturing firms were the population for this study.

A sampling frame describes the list of all population units from which the sample is selected (Cooper & Schindler, 2006). The elementary units or the group or cluster of units may form the basis of sampling process in which case they are called sampling units. A list containing all such sampling units is known as a sampling frame (Kothari, 2017). Thus sampling frame consists of a list of items from which the sample is to be drawn. In this study the sampling frame was the list of 499 supply chain managers in charge of procurement departments in manufacturing firms operating in Nairobi in Kenya.

Sample Size and Sampling Technique

The sample size of this study consisted of 222 supply chain managers in manufacturing firms in the Nairobi that were stratified and randomly selected from a list of 499 supply chain managers in manufacturing firms operating in Nairobi in Kenya. The research used Yamane sample calculation which is a way to determine the sample size for a study. The technique was the ideal method to use in this study because the size of the target population is known.

According to Kothari (2017) Sampling refers to the process of obtaining information about an entire population by examining only a part of it. Samples can either be probability samples or non-probability samples (Sauders, Lewis & Thornhill, 2003). Probability samples are those based on simple random sampling, systematic sampling, stratified sampling and cluster sampling. Non-probability samples are those based on convenient/ such as purposive sampling, judgment sampling and quota sampling (Kothari, 2017). According to Mugenda and Mugenda (2003), a simple random sample has an equal chance of inclusion in a sample. According to Polit and Beck (2003), a sample is a proportion of population to be researched while Kothari (2017) defines a sample as the selected respondent representing the population. The Yamane sample size states that:

$n = N/ (1 + N\ e^2)$

Where;

n = the sample size

N = the target population size (499 in the case of this study).

e = Margin of error based on the research condition at 0.05 significance.

The Sample will be allocated to the sectors using the formula in Equation 3.1 as provided by Kothari (2017)

$$n(\text{Sector}) = \frac{N(\text{Sector}) * n(\text{all Sectors})}{N(all\ Sectors)}$$

Where:

n (Sector) is the sample size at sector level.

N (Sector) is the population of a sector.
n (all sectors): is the sample size of the sectors combined.
N (all Sectors) is the population of the sectors.

Table 1: Sample Size

Sector	No. of supply chain managers	Unit of Analysis
		Sample Size
Building	20	9
Chemical	70	31
Energy	34	15
Food	71	32
Metal and Allied	66	29
Motor	27	12
Leather	7	3
Paper	63	28
Pharmaceuticals	21	9
Plastics	68	30
Textiles	35	16
Wood Products	17	8
Total	**499**	**222**

Data collection Instruments

This study relied on both primary and secondary data sources. Secondary data was collected for both independent and dependent variables for the period of between 2012 and 2016. This study utilized a questionnaire on the other hand to collect primary data. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents (Lumpkin & Dess, 2001).

Primary data was collected using a self-administered questionnaire. The questionnaire was used to explore the selected respondents' observations, views and opinions on the variables under study. This method was preferred because of the technical nature of items since the scale and the need to ensure reliability of responses from the respondents. Each questionnaire was divided into two sections to obtain information covering various aspects of the study. Section A covered demographic characteristics of the respondent while Section B covered both independent variables and the dependent variable.

Data Collection Procedure

Data collection refers to the process of collecting raw and unprocessed information that can be processed into meaningful information, following the scientific process of data analysis (Gall, Gall & Borg, 2007). According to Rotich and Simam (2009), the sources of data can either be primary or secondary. The study used primary data. Gale, Heath, Cameron, Rashid

and Redwood (2013) defined primary data as the original data which is originated for the purpose of the research at hand. Kothari (2017) describe primary data as those which are collected afresh and for the first time, and thus happen to be original in character. Navarro Sada and Maldonado (2007) describes primary data as those items that are original to the problem under study while Ember (2009) describe primary data as data collected by the investigator in various field sites explicitly for a comparative study. The primary data collection procedure started with identifying the respondents and their accessibility. The availability of the questionnaires and competent research assistants was ascertained. A letter of introduction as student was requested from the university.

The data collection procedure involved distribution of the questionnaires to the respondents by the researcher and four research assistants. They were collected on agreed upon time. The research assistants were instructed to ensure punctuality in appointments, friendliness and use of clear and simple language where the questionnaires will be physically delivered. Some questionnaires were sent electronically to save on time and where physical accessibility is a challenge. The data was collected through questionnaires which were administered by the researcher and research assistants. The questionnaires were administered preferably within the premises of the responding institutions to allow references where necessarily. Prior appointment was necessarily to allow the respondents to familiarize with the questions and make the necessarily reference.

Data Analysis and Presentations

The raw data collected from the field was transformed into meaning information as it was cleaned, edited and then coded. Kothari (2017) defined data analysis as the computation of certain measures along with searching for patterns of relationships that exist among data groups. Data processing and analysis is essential to ensure that all relevant data is gathered for making contemplated comparisons and analysis (Mugenda, 2008). The researcher used descriptive analysis, correlation analysis and regression analysis to analyse the data. The data collected using the open ended questions were analysed using content analysis.

According to Prasad (2008) content analysis is any research technique for making inferences by systematically and objectively identifying specified characteristics within text. Zhang and Wildemuth (2009) defined content analysis as a research method that uses a set of procedures to make valid inferences from text. Choy (2014) lists content analysis as a key non-reactive research methodology and described it as a technique for gathering and analysing the content of text. The 'content' refers to words, meanings, pictures, symbols, ideas, themes, or any message that can be communicated. The 'text' is anything written, visual, or spoken that serves as a medium for communication (Choy, 2014). The content analysis was used to analyse qualitative data. The texts of the open ended questions were studied and subdivided into themes guided by the objectives of the study. The themes then guided the researcher to analyse the data. According to Mbwesa (2006) and Mugenda and Mugenda (2003) descriptive analysis involves finding numerical summaries to provide a deeper insight into the characteristics and description of the variables under study.

Correlation analysis involves using the collected data to determine whether a relationship exists between two or more quantifiable variables where the magnitude and direction of correlation is expressed by correlation coefficient (Cohen et al., 2014). According to Cohen, West and Aiken (2014) linear regression analysis involves measuring the linear association between a dependent and an independent variable(s). It assumes the dependent variable is predicatively linked to the independent variable(s). Regression analysis therefore attempts to predict the values of a continuous interval or scaled dependent variable from the specific values of the independent variable(s).

The study used both qualitative and quantitative data as advocated for by Babbie (2013). Qualitative data from open ended questions were analyzed using content analysis while Statistical Package for Social Sciences (SPSS) software version 21 was used in running the statistical tests. SPSS was chosen because as indicated by Babbie (2013) it is user friendly and gives all the possible analysis. The categories of responses were identified, coded and entered into SPSS variable data sheet for both descriptive and quantitative analysis.

Descriptive analysis generated measures of central tendency, that is, frequencies, percentages, means and standard deviation which were presented in tables and interpreted appropriately. Conditional linear regression tests were conducted before the data were analyzed further. These tests are sampling adequacy test to determine adequacy of the sample size for factor analysis, autocorrelation tests to find out if there is correlation between the residue terms for any two observations, multicollinearity to test whether more than two independent variables are inter-correlated, outliers test to identify if there is any observation far placed from the other observations, Bartlett's test to examine if correlation matrix is an identity matrix and normality tests to determine if data is normally distributed. After conducting diagnostic tests, factor analysis will be done to identify factors which may not be instrumental to the study. Finally, correlation analysis and regression analysis was done.

Regression Analysis

Regression analysis is a measure of the ability of independent variable(s) to predict an outcome of a dependent variable where there is a linear relationship between them. In this study regression analysis was done to establish whether independent variables predicted the dependent variable. The R square, t-tests and F-tests and Analysis of Variances (ANOVA) tests were generated by SPSS to test the significant of the relationship between the variables under the study and establish the extent to which the predictor variables explains the variation in dependent variable. Hierarchical Moderated Multiple Regression model was also used to determine the effect of the moderating variable on the whole model where the R^2 values with and without the moderating variable were compared (Brace, Kemp & Snelgar, 2012). The research hypotheses were tested using the p value approach at 95% confidence level based on linear regression analysis output produced by SPSS. The decision rule was that the null hypothesis should be rejected if the calculated p-value was less than the significant level (0.05); and accepted if the calculated p-value was greater than the significance level (0.05). The significance of the independent variables was tested using F test and p value approaches.

The decision rule was to reject the null hypotheses that the effect of independent variable(s) is insignificant if the computed F value exceeds the critical F value or if the P value was less critical value of 0.05.

RESEARCH RESULTS

Descriptive Results

The study further analyzed some of the cost related to procurement functions with the intention of establishing the extent manufacturers in Kenya optimized such costs. The study focused on cost optimization through strategic outsourcing, consolidation of suppliers and improvement of contracts. The findings are presented in Table 4.8.

Table 2: Descriptive Results for Procurement Optimization Costs

	Statistics	2012	2013	2014	2015	2016
Strategic sourcing	Mean	52083.72	51578.17	47766.41	65150	50603.28
	Std. Deviation	30490.84	26391.11	25426.73	25878.71	28207.07
	Minimum	12089	6978	6648	8035	6761
	Maximum	99811	95338	91918	99351	97357
Consolidation of suppliers	Mean	58822.24	61034.83	61258.76	42756.79	53358.31
	Std. Deviation	25707.45	25685.17	30147.46	22062.22	28955.69
	Minimum	7569	6667	9258	11034	7514
	Maximum	98398	95689	100022	87662	99895
Improvement contract	Mean	61934.1	50135.41	57528.72	54003.52	50649.48
	Std. Deviation	30078.69	25732.76	27102.77	30597.53	25989.64
	Minimum	6660	8443	10070	6798	11389
	Maximum	98276	94886	99928	96151	99414

The findings revealed that through strategic outsourcing, consolidation of supplier and improvement of contracts, manufacturers in Kenya minimized procurement costs from an average of 52 million in 2012 to 50 million in 2016 through strategic outsourcing while from 58 million to 53 million through consolidation of suppliers and finally improvement of contract reduced costs from an average of 61 million to 50 million in five years. The findings implied that procurement cost optimization is critical in reducing procurement expenses. Ehrlenspiel, Kiewert, Lindemann and Hundal (2007) also argued that cost optimization is a process that should be carried out throughout to ensure that the cost of the manufacturing is kept within the estimated cost limits.
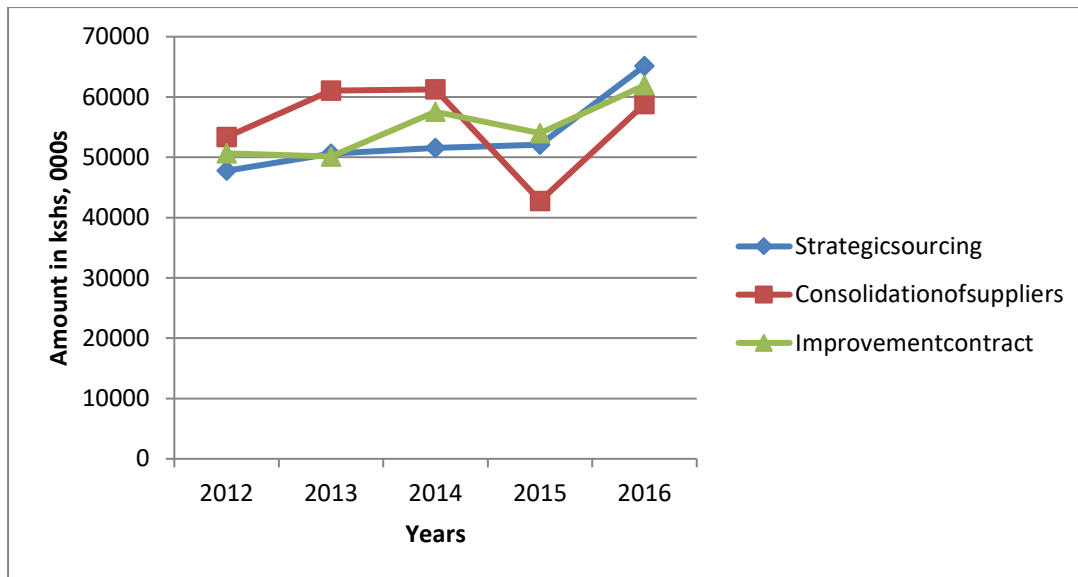
Figure 1: Trends for Procurement Optimization Costs

The results presented in the Figure 1 further confirmed that procurement cost optimization has been very critical in management cost related to procurement function. The trends indicate slight changes in procurement costs as results of procurement cost optimization.

Correlation Analysis

The results in Table 2 revealed that there is a significant correlation between procurement cost optimization and performance of manufacturing firms with p- value of 0.000 which is less than 0.01 and Pearson correlation coefficient was 0.562 while other independent variables were held constant. This implies that there was a significant relationship between procurement cost optimization and performance of manufacturing firms in Kenya. The positive correlation coefficient value implies that there is a positive relationship between procurement cost optimization and performance of manufacturing firms in Kenya, that is, as the procurement cost optimization improves the performance of manufacturing firms improves. The study concluded that there is a significant strong positive relationship between procurement cost optimization and performances of manufacturing firms in Kenya. The findings are in line with Claycomb, Dröge and Germain (1999) who found out that there is a significant strong positive relationship between supplier development and operational performance of manufacturing firms in Nairobi city. The findings also concur with Mose, Njihia and Magutu (2013) who found out that there is a significant strong relationship between procurement cost minimisation and performances of manufacturing firms.

Table 2: Correlation Matrix

	Procurement Cost Optimization	Performance of Manufacturing Firms
Procurement Cost Optimization	1	

Performance of Manufacturing Firms	0.562**	1

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

Regression Analysis

The third hypothesis of the study was that there is no significant influence of Procurement Cost Optimization on the performance of manufacturing firms in Kenya. The study used univariate regression analysis to test whether procurement costs optimization influence the performance of manufacturing firms in Kenya. The findings of univariate regression analysis are presented in Table 3 to Table 5.

Table 3: Model Summary for Procurement Cost Optimization

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.562	0.316	0.312	0.60456

a. Predictors: (Constant), Procurement Cost Optimization

b. Dependent Variable: Performance of manufacturing firms

The results of the model summary presented in Table 3 revealed that the R-square was 0.316. These findings implied that procurement cost optimization accounted for 31.6% of the variation in performance of manufacturing firms in Kenya other factors held constant. The remaining 68.4% variation in performance of manufacturing firms in Kenya was explained by other variables which are not in this model. The results are in line with Dehning, Richardson and Zmud (2007) who found out that procurement cost minimization accounted for the highest variation in performance of manufacturing firms. The results are also supported by Vickery, Jayaram, Droge and Calantone (2003) who found out that procurement cost optimization affects profitability of manufacturing firms

Table 4: ANOVA for Procurement Cost Optimization

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	31.682	1	31.682	86.683	0.000
1	Residual	68.712	189	.365		
	Total	100.393	190			

a. Predictors: (Constant), Procurement Cost Optimization

b. Dependent Variable: Performance of manufacturing firms

Table 4 presented the results of analysis of variance (ANOVA) for the model of procurement cost optimization and performance of manufacturing firms in Kenya. The F-statistic obtained was 86.683 with a p-value of 0.000. The findings implied that univariate model of procurement cost optimization and firm performance was statistically significant. The findings revealed that procurement cost optimization was a significant predictor of

performance of manufacturing firms in Kenya. Thus the null hypothesis was rejected and concluded that there was a significant influence of Procurement Cost Optimization on the performance of manufacturing firms in Kenya.

Table 5: Regression Coefficients for Procurement Cost Optimization

	β	Std. Error	Beta	t	Sig.
(Constant)	1.532	0.224		6.842	0.000
Procurement Cost Optimization	0.591	0.063	0.562	9.380	0.000

a. Predictors: (Constant), Procurement Cost Optimization

b. Dependent Variable: Performance of manufacturing firms

Table 5 shows regression coefficients summary in which t-values were 6.842 and 9.380 with p-values of 0.000 which are less than 0.05 hence the model was statistically significant, thus the beta coefficient 1.532 and 0.591 were statistically significant. The model is defined as Y = 1.532+ 0.591X3, where Y was the Performance of Manufacturing Firms and X3 was procurement cost optimization this implies that a unit change in procurement cost optimization would result to 0.591 units change in performance of manufacturing firms in Kenya. This further confirmed that there was a significant strong positive linear relationship between Procurement Cost Optimization and performance of manufacturing firms in Kenya. These findings revealed that that there was a significant positive linear influence of procurement cost optimization and performance of manufacturing firms. The findings are in line with Ehrlenspiel, Kiewert, Lindemann and Hundal (2007) who also argued that cost optimization is a process that should be carried out throughout to ensure that the cost of the manufacturing is kept within the estimated cost limits.

SUMMARY OF FINDINGS

The study was to determine the influence of procurement cost optimization on performance of manufacturing firms in Kenya. The descriptive analysis findings implied that manufacturing firms in Kenya had procurement cost optimization practices in place to reduce the amount spent on procurement functions.

The study further used correlation, univariate regression and multivariate regression analysis to test influence of procurement cost optimization on performance of manufacturing firms in Kenya. The findings of correlation and regression analysis conducted using both primary data and secondary data revealed that that there was a significant positive linear relationship between procurement cost optimization and performance of manufacturing firms in Kenya. The influence of procurement cost optimization on the performance of manufacturing firms in Kenya was statistically significant with the p value of less than 0.05. The study therefore rejected the null hypothesis that there is no significant influence of procurement costs optimization on the performance of manufacturing firms in Kenya hence the study concluded

that procurement costs optimization significantly influences the performance of manufacturing firms in Kenya.

CONCLUSION

On the influence of procurement cost optimization and performance of manufacturing firms, the study concluded that by working with suppliers that are able to offer a variety of stocks, to the firms can enhance their performance. Supplier with a wide portfolio of products and services reduces the costs that are related to acquiring new supplier such as supplier appraisal costs.

The study also concluded that adoption of integrated planning and execution systems, use of E-procurement and the use of Information Technology (IT) supported process in supply chain management simplifies the procurement process hence enhancing supply chain optimization. The study finally concluded that in order to benefit from supply chain optimization, firms must have a competent team in the procurement departments just like in other sector to enhance the overall performance. Firms that perform better in supply chain functions also have a highly skilled procurement staff both academically and experience wise

RECOMMENDATIONS

On the influence of procurement cost optimization on the performance of manufacturing firms, the study recommended that manufacturing firms that wish to optimize their procurement costs should start by trimming the number of suppliers to reduce cost associated with procurement. The firms should also do business with suppliers that are able to offer a variety of stocks to reduce the number of suppliers. The study also recommended consolidation of suppliers to help the firms to cuts procurement cost by conducting early budgeting and planning for all procurement activities to manage the procurement costs. The study finally recommended that management of the listed firms should adopt strategic cost management models which significantly reduce procurement cost.

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