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Is there a Link between Supply Chain Strategies and Firm Performance? Evidence from Large-Scale Manufacturing Firms in Kenya

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ABSTRACT: The purpose of this study was to establish the relationship between supply chain strategies and performance of large-scale manufacturing firms in Kenya by addressing three primary gaps in the literature. The research gaps include the research findings and results on the relationship between supply chain strategies and firm performance that have been contradicting and no attempt to clear the contradictions; biased and unbalanced analysis of the different measures of firm performance, and failure to use weighted scores to measure firm performance. Resource-Based View guided this study. A sample of one hundred and thirty-eight (138) firms was drawn using proportionate sampling from a population of six hundred and twenty-seven (627) large-scale manufacturing firms in Kenya. The response rate was seventy-five (75) percent. The correlation analysis and regression analysis models were used to test the hypotheses. The study findings indicate that Supply chain strategies are useful predictors of the firm's performance as supply chain strategies explain 76.7 % of the changes in the firm's performance.

Keywords: *Supply chain management, Supply chain strategies, Firm performance*

1. INTRODUCTION

The concept of supply chain management (SCM) has been the subject of numerous studies in operational management, purchasing, logistics, and marketing. There are a number of constructs like supply chain strategy and technology that can be used in these diverse research domains as there is lack of empirical evidence in SCM practice (Halley & Beaulieu, 2009; Hult, Ketchen, Cavusgil, & Calantone, 2006; Ketchen & Giunipero, 2004). Owing to lack of consensus on definition and differing views on the concept of SCM, this study was guided by Mentzer et al. (2001). Mentzer et al. (2001) definition that is broad enough and captures the issues of strategy and firm performance. They define supply chain management as:

“...the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer et al., 2001, p. 18)”

The Resource Based View (RBV) and Transactional theories have played a very crucial role when conducting research on the strategic perspectives of operations and supply chain management (Burgess, Singh, & Koroglu, 2006). The resource-based view theory has been greatly used in SCM studies in the last twenty years. This theory has to a great extent shaped mastery of operational decisions in the context of SCM (Halley & Beaulieu, 2009; Patterson, Grimm, & Corsi, 2003).

Under the economic pillar of Kenya Vision, 2030, manufacturing is one the five sectors that has been identified to support economic development. In line with the aspirations of Vision 2030, it is expected to be a dominant and aggressive sector to support the national growth, create employment, earn the country foreign exchange and facilitate foreign investment (GoK, 2007). Many large-scale manufacturing subsector companies in Kenya particularly multinational manufacturing firms have migrated their operations to other countries. These firms have relocated, shut down or downsized their operations because they consider Kenya as one of the least yielding countries worldwide. This is due to poor infrastructure, high tariffs and taxes. The local firms have not been able to fill the manufacturing gaps left by the multinationals as the government has done

very little to develop this struggling subsector leading to low international competitiveness (Okoth, 2012; PwCIL, 2010).

Hines (2009) define what the supply chain strategies are, how they work and why firms invest in them as follows:

“Supply chain strategies require a total systems view of the linkages in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer. As a consequence, costs must be lowered throughout the chain by driving out unnecessary costs and focusing attention on adding value. Throughput efficiency must be increased, bottlenecks removed and performance measurement must focus on total systems efficiency and equitable reward distribution to those in the supply chain adding value. The supply chain system must be responsive to customer requirements.”

In essence, research indicates that there are sixteen supply chain strategies in use today. These include: synergistic; project logistics; Nano-chain; information networks; market dominance; value chain; extended; efficient; cash-to-cash cycle; innovation; speed to market; risk-hedging; micro-chain; tie down; none existent; and demand supply chain strategies. There are some benefits, challenges, and relative complexity for each of these sixteen supply chain strategies. This has led to the categorization of the sixteen supply chain strategies into a dichotomy of Long-range and Mid-range supply chain strategies (Gattorna, 2006; Gadde, & Hakansson, 2001). The sixteen-supply chain strategy dichotomy was central in this study about firm performance. This study considered both the direct effect of these long-range and mid-range supply chain strategies on the performance of large-scale manufacturing firms in Kenya.

Performance management is crucial and a paramount practice to the success of any business. Being a wide-ranging topic, one can focus on target/goal setting, measurement, feedback or reward. The biggest challenge facing firm performance measurement is most scholars limit themselves to their areas of specialization; few academics across these functional boundaries to make reference to the research of other experts outside their functional areas (Neely, Bourne, & Kennerley, 2000). This study measured performance using indicators cutting across all functional areas in relation to firm performance.

Organizations in today's business environment have a big challenge on how to remain competitive in the marketplace through firm performance especially the organization-wide performance (Collins, Worthington, Reyes, & Romero, 2010). Agha, Alrubaiee, & Jamhour (2011), argued that to remain competitive and achieve competitive advantages, managers should increase organizational performance by managing the dimensions of core competence i.e. a shared vision; cooperation and empowerment. Some authors like Keegan, Eiler, & Charles (1989) and Kaplan & Norton (1992) have suggested appropriate firm performance measurement frameworks to the management community. They include the performance measurement matrix and the Balanced Scorecard (BSC). The performance measurement matrix as advanced by Keegan et al. (1989) ranks activities in matrix form, but it does not assign weights. The BSC is a tool that gives a balanced view of how an organization is performing by cascading firm performance perspectives down from the strategic to operational level of business at four levels of: customer service; financial stewardship; internal business processes; and service delivery innovations (Gunasekaran, Patel, & Tirtiroglu, 2001). The BSC has simplified the measurement of firm performance, especially for supply chains where all units share the metrics in the organization and supply chain partners (Kaplan & Norton, 1992). According to Bolo (2011) the concept of firm performance and its measurement has not been extended beyond the firm's inbound operations. This limited visibility of measures tends to exclude SC performance measures. This study explored the balanced approach for firm performance with four perspectives within the context of large-scale manufacturing firms in Kenya.

1.1. Research Problem and Research Focus

According to Cooper & Ellram (1993), SCM is an integrative philosophy to manage the total flow of goods from the supplier to the ultimate user. Varma, Wadhwa, & Deshmukh (2006) considers this definition of SCM as a management philosophy that tries to bring about integration among various functions. Cousins, Lawson, & Squire (2006), definition is comprehensive and critical, they describe the concept as consisting of the flow of raw materials, finished goods, finances and information while aiming to achieve high customer expectations through proper planning on demand forecasts, sales generation, and efficient distribution. The flow should be well coordinated in the form of a network starting with suppliers then to manufacturers, next to distributors

and finally customers. But this definition does not include the elements of uncertainty which require some element of strategic focus. According to Kamaruddin & Udin (2009) there is a high degree of uncertainty and difficulty in managing supply chains, especially where there are multiple relationships and interactions between elements of the firm's existing network.

According to PwCIL (2010) and Okoth (2012), Kenya's large-scale manufacturing subsector has a challenging history in terms of performance and unstructured strategy. This study sought to test contextually the relationship between SC strategies and performance of large-scale manufacturing firms in Kenya. As observed by Burgess et al. (2006) most of the researches done on SCM is on very few industries covering the consumer goods retailing, computer assembling and automobile manufacturing. This study overcame this by covering twelve subsectors of the large-scale manufacturing firms in Kenya.

An expanded approach of sixteen-supply chain strategies dichotomy is in use today, and the future shall see firms competing using their supply chains strategies (Gadde & Hakansson, 2001). Very few studies have attempted to address such an expanded approach to sixteen SC strategies in establishing the relationship between supply chain strategy and firm performance (Gattorna, 2006; Russell & Hoag, 2004). The sixteen-supply chain strategy dichotomy provides an extended approach whose relationship with firm performances are the subject of this study.

Most studies have therefore used a limited number of measures that are not objective enough to establish a link with the concepts studied. Mainly, they have not used the Balanced Scorecard to determine firm performance something the current study sought to use. This was therefore guided by the following research question: What is the relationship between SC strategies and firm performance? The main objective of this study was to establish the relationship between supply chain strategies and performance of large-scale manufacturing firms in Kenya.

1.2. Empirical studies

Teeratansirikool, Siengthai, Badir, & Charoenngam (2013) argued that all competitive strategies positively and significantly enhance firm performance. Khan & Pillania (2008), argued that supplier evaluation, strategic supplier partnership, sourcing flexibility and trust in supply chain members have a

significant effect on supply agility and firm’s performance. Qrunfleh & Tarafdar (2014) posits that in small firms, efficient Supply Chain integration plays a more critical function for sustainable performance improvement, while, in large firms, the close inter-relationship between the level of SCM practices and competition capability have more significant effect on performance improvement.

Li, Ragu-Nathan, Ragu-Nathan, & Subba Rao (2006) in their study they conceptualized on five dimensions of SCM practices (customer relationship, quality of information sharing, strategic supplier partnership, level of information sharing, and postponement) and tested the relationships between competitive advantage, SCM practices, and organizational performance. Their results indicate that higher levels of SCM practices can lead to improved competitive advantage and enhanced firm performance.

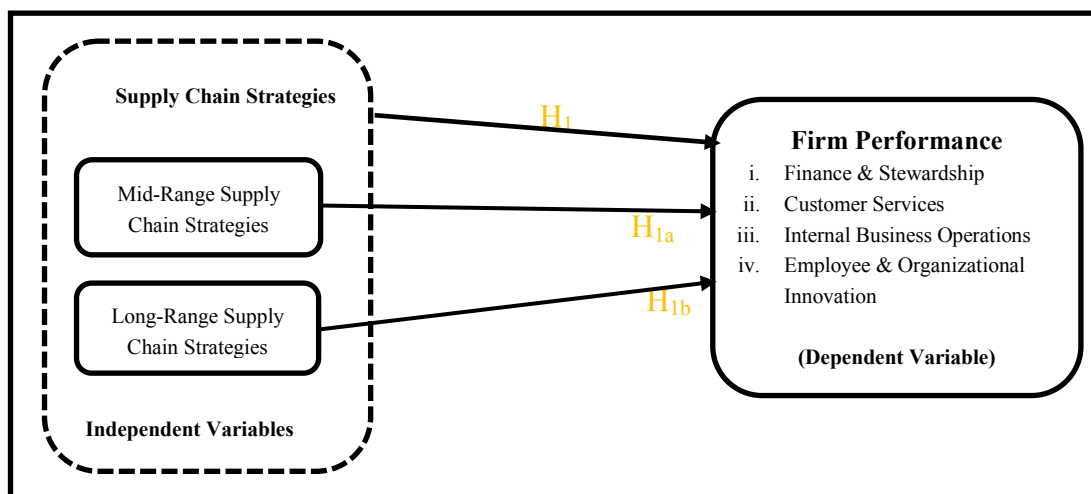
Ou, Liu, Hung, & Yen (2010) found out that external customer-firm-supplier relation management positively influence firm internal contextual factors that in turn have positive effects on firm performance. Their finding indicates that successful implementation of SCM practices directly improves operational performance, and also indirectly enhances customer satisfaction and financial performance of the organization.

Golicic & Smith (2013) concluded that the relationship between environmental supply chain practices and operational-based, market-based and accounting-based forms of firm performance are positive and significant, giving support for the argument that sustainable supply chain management leads to increased firm performance. Zolait, Ibrahim, Chandran, Pandiyan, & Sundram (2010) in their study argued that information flow, financial flow, and physical flow were statistically significant to firm performance. Lee, Kim, & Choi (2012) argued that there are a significant indirect relationship between Green Supply Chain Management (GSCM) practice implementation and firm performance through mediating variables of operational efficiency and relational efficiency.

1.3. Conceptual Model and Hypothesis

The conceptual model in figure 1 below is in support for the arguments raised from literature review that the SC strategies that consist of Mid-range SC strategies and Long-range SC strategies have a relationship with firm performance outcome of large-scale manufacturing firms in Kenya. Figure 1 below is emphasizing the interconnection between the SC strategies and firm performance in one comprehensive framework intended to assist the researcher in developing a clear understanding of the linkages between the two variables.

Figure 1: Conceptual Model



Source: Author, 2014

Based on the study objective, this study examined the supply chain strategies that consist of Mid-range SC strategies and Long-range SC strategies and their relationship with firm performance. Hence, the following hypotheses were tested:

H1: Supply chain strategies are positively related to firm performance

Given that the sixteen-supply chain strategy dichotomy (Mid-range SC strategies and Long-range SC strategies) was used as independent variables about firm performance, the following two sub-hypotheses were derived from the hypothesis two.

H1a: Mid-range SC strategies are positively related to firm performance

H1b: Long-range SC strategies are positively related to firm performance

2. METHODOLOGY

2.1. General Background of Research

The positivistic philosophy was preferred to guide this study since it combines static and a priori approaches. The positivistic paradigm often requires a test of a model using questionnaires constructed without input from the respondents as it was the case for this study. Moreover, this research comprised of predefined (a priori) relationships that required primarily theory testing as all the hypotheses are stated with predictive rigor for acceptance aimed at making positivistic conclusions.

2.2. Research Design

This study adopted a cross-sectional survey and descriptive design. The design was appropriate because it is useful in establishing the nature of existing situation and current conditions and also in analyzing such situations and conditions. Johnson, Scholes, & Whittington (2007) did a similar study in USA and used the same methodology and variables. Fawcett, Ogden, Magnan, & Cooper (2006) used strategy implementation as the independent variable and performance as the dependent variable using a triangulation methodology consisting of literature review, survey, and case studies. Given this approach, a cross-sectional survey method was used to obtain the empirical data to determine the linkages between variables.

2.3. Population of the Study

The target population was all large-scale manufacturing firms in Kenya. The unit of analysis was the large scale manufacturing firm. In Kenya, according to the KAM directory (2010/2011) large scale enterprises have more than 100 workers, medium enterprises have from 51 to 100 workers, small enterprises have from 11 to 50 workers, and micro-enterprises are those with 10 or fewer workers. There are 2,000 manufacturing companies in Kenya, from which the target population is 627 large-scale manufacturing firms. Although the categorizations of manufacturing firms according to size has been based on the number of employees, the type and level of technology used, size of capital investment and capacity utilization can be used to justify the choice of large-scale manufacturing firms. The main reason for this choice is that these firms are likely to exhibit an elaborate SCM philosophy, exhibit high activity levels, have enough resource to be employed in supply chain strategy implementation, make use of supply chain strategies and SCT in SCM. The number of employees is a good indicator of size because being profit making; employees can be taken as a proxy for supply chain performance, profits, technology utilization and firm performance. Large-scale manufacturing firms that make more than two-thirds of the industrial coverage is considered as the strength of this research since prior studies had ignored sector-specific supply chain variables on firm performance.

2.4. Sample of Research

The appropriate sample size for a population-based survey was determined largely by three factors (Kate, 2006): (i) the estimated percentage prevalence of the population of interest – 10% (ii) the desired level of confidence and (iii) the acceptable margin of error.

The sample size required can be calculated according to the following Kate (2006) formula

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

Where:

n = required a sample size, t = confidence level at 95% (standard value of 1.96), p = estimated percentage prevalence of the population of interest – 10%, m = margin of error at 5% (standard value of 0.05)

Therefore, the sample size (n) for this study can be computed as follows:

$$n = \frac{1.96^2 \times .1(1-.1)}{.05^2}$$

$$n = \frac{3.8416 \times .09}{.0025}$$

$$n = \frac{.3457}{.0025}$$

$$n = 138.30 \sim \mathbf{138}$$

One hundred and thirty-eight (138) large scale manufacturing firms were sampled and contacted to participate in the study. Then the large-scale manufacturing firms (sample) were stratified into twelve key sectors/strata as shown in table 1 based on the KAM directory of 2010/2011.

Table 1: Sampling Strata

| Large-Scale Manufacturing Sectors/Strata | Strata Popn N | Proportionate Sampling P_n=N/Total Popn *Sample |
|---|----------------------|--|
| Building, Construction, and Mining | 15 | 3 |
| Food, Beverages, and Tobacco | 154 | 33 |
| Chemical and Allied | 71 | 16 |
| Energy, Electrical and Electronics | 43 | 10 |
| Plastics and Rubber | 66 | 14 |
| Textile and Apparels | 68 | 15 |
| Timber, Wood Products, and Furniture | 26 | 6 |
| Pharmaceutical and Medical Equipment | 32 | 7 |
| Metal and Allied | 62 | 14 |
| Leather Products and Footwear | 8 | 2 |
| Motor Vehicle Assembly and Accessories | 22 | 5 |
| Paper and Paperboard | 60 | 13 |
| Total | 627 | 138 |

Source: Researcher, (2014)

Proportionate sampling was done to pick the required number of respondents from the twelve (12) strata. This gave every firm an opportunity to participate in the study.

2.5. Instrument and Procedures

Data for this study was collected from both primary and secondary sources that are meant to reinforce each other (Stiles, 2003). Primary data entailed responses on all the study variables: supply chain strategies and firm performance. Secondary data, particularly five-year historical data on firm performance data was sourced from company annual reports, pamphlets, office manuals circulars, policy papers, corporate /business plans as well as survey reports from Kenya Association of Manufacturers and Kenya Central Bureau of Statistics for the years 2006 - 2010. This is because the normal planning cycle at the strategic level is five years.

The questionnaire and data forms were the principal tools for collecting primary data and secondary data respectively. One respondent, either the Operations Manager or Supply Chain Management Manager or procurement manager from each firm, was selected to participate in the study. Wilson & Lilien (1992) showed that single informants are most appropriate in non-new task decisions. Based on this, the criterion for choice of a respondent in each firm is that one should be experienced or knowledgeable about the supply chain management, operations management decisions and activities of the firm at the time of the survey. The researcher administered the questionnaires personally in order to enhance the response rate and quality of data collected as supported by Bhagwat & Sharma (2007) using the official request.

2.6. Data Analysis

The positivistic approach that advocates for hy-

potheses testing using quantitative techniques to research guided data analysis (Stiles, 2003). Thus, information required for testing the study hypotheses was generated using quantitative data analytical techniques. Consequently, data analysis followed Umma (2006) four step process for data analysis: "getting data ready for analysis; getting a feel for the data; testing the goodness for the data; and testing the hypotheses".

The researcher used descriptive statistics for Likert scale variables in the questionnaire. The measures of dispersion were used in order to explore the underlying features in the data on large scale manufacturing firms in Nairobi, Kenya. Descriptive statistics covered all response variables as well as the demographic characteristics of respondents. Descriptive statistics provides the basic features of the data collected on the variables and provide the impetus for conducting further analyzes on the data (Ezirim & Nwokah, 2009; Mugenda & Mugenda, 2003).

A correlation analysis was done to establish the relationships among the study variables. The correlation analysis was computed to describe the relationships that exist among key variables of the study and/or use the known correlation to determine the outcome from one variable to another. A multiple linear regression model was adopted to study the linear relationships among the various study variables. A multiple linear regression analysis is a multivariate statistical technique used to estimate the model parameters and determine the effect of individual independent variables (IVs) on the dependent variable (DV).

Firm performance

$$(Y) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 \dots + b_pX_p + e_i \quad (1)$$

Where;

Y is the dependent variable (Firm Performance) and is a linear function of X1, X2, X3, X4...Xi plus ei .

Y Firm Performance Index (FPI) was computed as an average of the five year's Annual Firm Performance Composite.

b0 is the regression constant or intercept, b1-p are the regression coefficients or change induced in Y by each X, ei is a random variable, error term that accounts for the variability in Y that cannot be explained by the linear effect of the i predictor variables and X1-p are independent variables (Long-range and Mid-range supply chain strategies)

3. RESEARCH RESULTS AND FINDINGS

One of the methodological weaknesses of previous studies were small sample sizes and low response rate. This study's response rate of 75% is high compared to previous studies whose average response rate was 65 percent or less. Kidombo (2007) who had studied large private manufacturing firms in Kenya had 64% response rate; Kirchoff (2011) had a very low response rate of 28 percent. According to Tomaskovic-devey et al. (2007) any response rate of about 15.4% is considered as yielding a relatively high response rate considering the demands on the time of top-level executives. All subsectors of the large scale manufacturing sector were well represented in this study, avoiding any chances of bias or misrepresentation.

The majority of the firms (68%) have successfully managed their supply chains while 16% see their supply chains as very successful and somewhat successful. This is an indication that the supply chain department exists in most large-scale manufacturing firms (84) and probably managed by specialists who understood what the items in the questionnaire were testing and the appropriate response that was required. This implies that only those firms that have managed their supply chains have sound strategies that are in place to guide the operations of the firm.

3.1. Firm Performance Index

Weighted scores were applied on the collected data to determine the firm performance index on average for all the firms that participated in this study as shown in Table 2 below.

Table 2: Firm Average Performance Index

| DOMAIN | | | ACHIEVEMENTS | | | | | Weighted Performance (WP i) ... (4) | | | | | |
|--|------------|------------|--------------------------------------|--------------|--------------|--------------|--------------|-------------------------------------|--------------|---------------|--------------|--------------|-------------------|
| | | | 2006 | 2007 | 2008 | 2009 | 2010 | 2006 | 2007 | 2008 | 2009 | 2010 | |
| A. Financial & Stewardship | | | | | | | | | | | | | Average FPI ----6 |
| Pre-tax Profits | Kshs . (m) | 10 | 108.6 | 132.1 | 137.2 | 131.8 | 158.0 | 10.86 | 13.21 | 13.725 | 13.18 | 15.80718 | |
| Debt –Equity Ratio | % | 5 | 38.3 | 42.1 | 48.0 | 47.2 | 50.5 | 1.91 | 2.10 | 2.40 | 2.36 | 2.525 | |
| Return on Investment | % | 5 | 41.7 | 45.9 | 51.1 | 53.7 | 57.5 | 2.08 | 2.29 | 2.55 | 2.68 | 2.87 | |
| Development Index | % | 5 | 44.7 | 49.5 | 55.4 | 60.1 | 66.0 | 2.23 | 2.47 | 2.77 | 3.00 | 3.30 | |
| Payback on investments | Time | 5 | 8.7 | 8.2 | 7.3 | 6.4 | 6.9 | 0.43 | 0.41 | 0.36 | 0.32 | 0.34 | |
| Weights – Sub Total | | 30 | 242.2 | 277.9 | 299.8 | 299.5 | 339.2 | 17.54 | 20.50 | 21.817 | 21.56 | 24.86 | |
| B. Customers Perspective | | | | | | | | | | | | | |
| Customer satisfaction | % | 10 | 61.3 | 65.7 | 70.8 | 75.8 | 79.7 | 6.13 | 6.57 | 7.08 | 7.58 | 7.97 | |
| Customer price margin | % | 6 | 39.8 | 41.8 | 43.4 | 45.5 | 46.5 | 2.39 | 2.50 | 2.60 | 2.73 | 2.79 | |
| Resolution of customer complaints | % | 4 | 60.0 | 64.7 | 69.5 | 73.4 | 79.2 | 2.40 | 2.59 | 2.78 | 2.93 | 3.17 | |
| Weights – Sub Total | | 20 | 161 | 172 | 183 | 194 | 205 | 10.9 | 11.7 | 12.5 | 13.3 | 13.9 | |
| C. Internal Business Operations | | | | | | | | | | | | | |
| Cost efficiency | % | 10 | 55.9 | 59.8 | 64.3 | 68.5 | 73.3 | 5.59 | 5.98 | 6.43 | 6.85 | 7.33 | |
| Automation | % | 8 | 50.9 | 56.2 | 61.7 | 66.3 | 72.7 | 4.07 | 4.50 | 4.93 | 5.30 | 5.82 | |
| Warranty quality | % | 6 | 55.9 | 59.6 | 63.8 | 68.3 | 73.3 | 3.35 | 3.58 | 3.83 | 4.10 | 4.39 | |
| Safety Measures | % | 2 | 59.1 | 63.9 | 68.9 | 72.0 | 78.9 | 1.18 | 1.27 | 1.37 | 1.44 | 1.57 | |
| Research & Development | % | 4 | 51.5 | 56.3 | 61.0 | 65.1 | 71.9 | 2.06 | 2.25 | 2.449 | 2.60 | 2.87 | |
| Work Environment | % | 2 | 56.3 | 60.4 | 64.9 | 68.5 | 73.6 | 1.12 | 1.20 | 1.29 | 1.37 | 1.47 | |
| Capacity Utilization | % | 4 | 58.2 | 62.3 | 67.9 | 72.3 | 77.9 | 2.33 | 2.49 | 2.71 | 2.89 | 3.11 | |
| ISO Certification (9001:2008) | % | 4 | 44.3 | 47.6 | 55.7 | 59.9 | 65.5 | 1.77 | 1.90 | 2.22 | 2.39 | 2.62 | |
| Weights – Sub Total | | 40 | 432 | 466 | 508 | 543 | 587 | 21.5 | 23.2 | 25.3 | 27.0 | 29.2 | |
| D. Employee and Organization Innovation | | | | | | | | | | | | | |
| Employee satisfaction | % | 5 | 59.4 | 64.2 | 68.1 | 71.8 | 75.8 | 2.97 | 3.21 | 3.409 | 3.59 | 3.79 | |
| Employee Retention | % | 2 | 75.6 | 79.8 | 81.9 | 85.7 | 87.3 | 1.51 | 1.59 | 1.638 | 1.71 | 1.746 | |
| Employee productivity | % | 2 | 60.5 | 65.0 | 69.4 | 72.0 | 75.5 | 1.21 | 1.30 | 1.38 | 1.44 | 1.51 | |
| Competency Development | % | 1 | 56.6 | 61.4 | 65.5 | 69.6 | 73.4 | 0.56 | 0.61 | 0.65 | 0.69 | 0.73 | |
| Weights – Sub Total | | 10 | 252 | 270 | 285 | 299 | 312 | 6.3 | 6.7 | 7.1 | 7.4 | 7.8 | |
| TOTAL/Performance Index | | 100 | Annual Firm Performance.....5 | | | | | 56.2 | 62.1 | 66.6 | 69.2 | 75.8 | 66.0 |

Source: Research Data, 2014

From the results in Table 2 above on firm performance, there is specific improvement on the four dimensions of firm performance of financial & stewardship, customers' perspective, internal business operations including those of employee and organization innovation. This is an indication that the firms have improved performance that is balanced touching on all aspects of the firm about its internal and external customers who make up its supply chain. All the four domains were equally affected in 2008/2009 period that might be as a result of the

post-election violence in Kenya. Each of the four dimensions of the firm's performance is a relative sector to the total sub weights. For example, in 2006 the firms scored 6.3 out of the possible score of 10% in the employee and organization innovation (x/10).

The above computations were done for each firm to determine their annual firm performance and firm performance index that was used as the dependent variables (Y) in the next section of correlation analysis and subsequently on test of hypotheses.

3.2. The Correlation between Supply Chain Strategies and Firm Performance

Spearman’s rank order correlation analyzes the relationships between supply chain strategies (Mid-range and long-range) and firm performance as presented in Table 3 below. From the results in Table

3, there is a strong, and positive relationships are observed between long-range supply chain strategies ($r = 0.690, p < 0.01$) and firm performance. These two long-range supply chain strategies are demand supply chain strategy and innovation supply chain strategy. Indeed, innovations and demand are specific the firms’ operations and products respectively.

Table 3: Correlation between Supply Chain Strategies and Firm Performance

| Supply Chain Strategy | Variables | Spearman’s rho Coefficients |
|------------------------|-------------------------|-----------------------------|
| Long-range SC Strategy | Innovation SC strategy. | 0.690(**) |
| Mid-range SC Strategy | No need for SC strategy | 0.591(*) |
| Long-range SC Strategy | Demand SC strategy. | 0.545(*) |

Source: Research Data, 2014

** Correlation is significant at $p < 0.01$ level (2-tailed).

* Correlation is significant at $p < 0.05$ level (2-tailed).

Also from the results in Table 3 above, the Mid-range supply chain strategy have a weak but significant relationship ($r = 0.591, p < 0.05$) with firm performance. This is characterized by a nonexistent supply chain strategy in the firm which can lead to total supply chain failure and customer dissatisfaction.

The results of supply chain strategy and firm performance show that it is long-range planning that can support firm competitiveness as evidenced by the effect of long-range supply chain strategies on both supply chain performance and firm performance. The Mid-range strategies are used by most firms as experimental strategies as they craft long-range strategies. The only surprising result is that none of the long-range supply chain is supporting both supply chain performance and firm performance, meaning that firms can implement several supply chain strategies to support various objectives at the supply chain level and corporate level.

3.3. Hypothesis Testing

This study aimed at establishing the relationship between SC strategies and firm performance among large-scale manufacturing firms in Kenya. The lit-

erature review and theoretical reasoning led to the reasoning that both Mid-range and Long-range supply chain strategies are associated with firm performance. The four Mid-range supply chain strategies are operational and will affect firm midterm performance. The long-range supply chain strategies are most representative of how companies articulate their models for competing now and in the future. Hence, the following hypotheses were tested:

H: *Supply Chain Strategies are positively related to Firm Performance*

The supply chain strategies items were measured on a scale of 1 to 5 where “5” was to a great extent and “1” to a very small extent. It consisted of statements that sought to measure the extent to which the firms have used the supply chain strategies. Supply chain performance index computed from the achievement on certain items for five years. The Spearman’s correlation showed significant relationship between long-range ($r = 0.690, p < 0.01$) and mid-range ($r = 0.591, p < 0.05$) supply chain strategies individually with firm performance. Further analysis using multiple regression analysis is presented in Table 4 below and Annex I.

Table 4: Regression Results for Supply Chain Strategies and Firm Performance

| Model Summary: Objective 2 (Data Analysis Model #i) Method: Stepwise (Criteria: Probability-of-F-to-enter ≤ .050, Probability-of-F-to-remove ≥ .100). | | | | | ANOVA(f) | | |
|---|----------|----------------------|-------------------------------|-----------------------------------|--------------------|----------|-------------|
| Stepwise Model | R | R² | Adjusted R² | Std. Error of the Estimate | Mean Square | F | Sig. |
| 1 | .545(a) | .297 | .291 | 10.19816 | 4490.500 | 43.177 | .000(a) |
| 2 | .674(b) | .455 | .444 | 9.02904 | 3432.442 | 42.104 | .000(b) |
| 3 | .720(c) | .519 | .505 | 8.52191 | 2612.157 | 35.969 | .000(c) |
| 4 | .757(d) | .574 | .556 | 8.06489 | 2164.888 | 33.284 | .000(d) |
| 5 | .793(e) | .629 | .611 | 7.55540 | 1900.903 | 33.300 | .000(e) |
| 6 | .818(f) | .669 | .649 | 7.17663 | 1683.812 | 32.693 | .000(f) |
| 7 | .837(g) | .701 | .679 | 6.85599 | 1512.331 | 32.174 | .000(g) |
| 8 | .848(h) | .720 | .696 | 6.67527 | 1358.204 | 30.481 | .000(h) |
| 9 | .860(i) | .739 | .714 | 6.47731 | 1239.438 | 29.542 | .000(i) |
| 10 | .868(j) | .754 | .727 | 6.32309 | 1138.048 | 28.464 | .000(j) |
| 11 | .876(k) | .768 | .740 | 6.17524 | 1053.680 | 27.631 | .000(k) |
| 12 | .891(l) | .794 | .767 | 5.84211 | 999.409 | 29.282 | .000(l) |

Source: Research Data, 2014

a, b, c, d, e, f, g, h, i, j, k, l Predictors: (Constant), Supply chain strategies
 m Dependent Variable: Firm Performance

From the regression results in Table 4 above, twelve models have been generated using a stepwise approach where the probability-of-F-to-enter was ≤ .050 while the probability-of-F-to-remove was ≥ .100. The stepwise multiple regression model number 12 or L is the most significant model since it has the inclusion of most supply chain strategies while the results are significant at the set confidence interval of 95%. Also from the model Table 4, it is observed that as one moves from stepwise model 1 to 12, the standard error of the estimated models decrease from 10.19816 to 5.84211 as so does the F values from 43.177 to 28.282. The adjusted R2 improves from 0.291 to 0.767. Although all the twelve models are significant, stepwise model number twelve is a good predictor of the relationship between supply chain strategies and firm performance.

The stepwise regression model number 12 shows a strong significant relationship between supply chain strategies and firm performance, implying that the supply chain strategies explain 76.7 % of the changes in the firm’s performance. The coefficients of this predictive model aimed at addressing the concerns of objective two as modeled in model number eight of the data analysis are given as in Annex I.

From the specific beta coefficients for the measures of supply chain strategies in Annex, I indicate that both long range and Mid-range the supply strategies make some contribution to the firm’s performance. All the long range supply chain strategies that affect supply chain performance also affect firm performance. They include the long range risk-hedging supply chain strategy (beta = -0.348); Speed to market supply chain strategy (beta = -0.304) and cash-to-cash cycle supply chain strategy (beta = -0.240). The supply chain strategies that have an impact on firm performance and not the firm’s supply chain performance outcome include: efficient supply chain strategies where the firm continuously plans its supply chain network to limit exposure to cost fluctuations(beta = 0.729); project logistics supply chain strategies that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change (beta = 0.435); innovation supply chain strategy focused on variable productivity to meet speculative purchasing and sales promotion (beta = 0.403); Demand supply chain strategy responsive and flexible to customer needs to enable the firm feed customers in ways that are efficient for them (beta = 0.343); Synergistic supply

chain strategy where the firm creates additional relationship with supply chain members at the point where their operation interact (beta = 0.261). These are among the long range supply chain strategies that build around projects, innovation, demand forecasting and synergy that are key to the firm's positive performance. The two Mid-range strategies that have a positive impact on the firm's performance include: Third-party supply chain strategy where the firm evaluates opportunities to outsource areas that are not their core competencies in the supply chain (beta = 0.310) and the supply chain strategy where numerous internal and external activities are co-ordinated to conform to the overall business strategy (beta = -0.235). The supply chain strategy on conformance has a negative effect on the firm's performance as it denies the firm some level of flexibility for the firm to adjust to the changes in its environment of operation. It only the investment on long-range supply chain strategies that can lead to improved firm performance levels.

As shown in Table 4 above and Annex I, when Mid-range and long-range supply chain strategies are included in the same model, they have a strong positive effect on firm performance with a correlation coefficient of $R = 0.891(1)$ and adjusted $R^2 = 0.767$, $F = 29.282$; $Sig. = .000(1)$. This implies that 76.7% of

the variance in the firm's performance is explained by the combined variables of Mid-range and long-range supply chain strategies. The relationships between supply chain strategies and firm performance are positive. Given that the calculated $F = 29.282$, while the F Critical = 1.7611; at $\alpha = 5\%$ (95% C.I), numerator degrees of freedom - $V1 = 16$ (17-1) and denominator degrees of freedom - $V2 = 87$ (103-16). Then $F \geq F$ Critical at $\alpha = 5\%$. This is a clear indication that supply chain strategy is a significant predictor of the firm's performance. The relationships explained by the combined variables of Mid-range and long-range supply chain strategies on the firm's performance are positive and statistically significant. Hence, H_0 is accepted.

The second objective had two sub-hypotheses to be tested. Other than the combined effect of supply chain strategies, it was anticipated that Mid-range supply chain strategies are likely to have important implications on firm performance. Hence, the following sub-hypothesis was tested:

H1a: Mid-range SC Strategies are positively related to Firm Performance

The results of Spearman's correlation showed a correlation coefficient of $r = 0.591$, $p < 0.05$. The multiple regression analysis is presented in Table 5a&b below.

Table 5a: Regression Model Summary Results for Mid-Range Supply Chain Strategies and Firm Performance

| | R | R Square | Std. Error of the Estimate | F | Sig. |
|---------------------|---------|----------|----------------------------|-------|---------|
| Model No. 8a | .545(a) | .297 | 11.24111 | 2.218 | .102(a) |

Source: Research Data, 2014

a Predictors: (Constant), Mid-range Supply chain strategies

b Dependent Variable: Firm Performance

Table 5b: Regression Results for Mid-Range Supply Chain Strategies and Firm Performance

| Mid-range Supply chain strategies | Nano-Chain supply chain strategy | Tie down the firm supply chain strategy | Third-party SC strategy | No need for supply chain strategy |
|-----------------------------------|----------------------------------|---|-------------------------|-----------------------------------|
| Standardized Coefficients (Beta) | .477 | .211 | -.124 | -.175 |

Source: Research Data, 2014

The beta values for the four Mid-range supply chain strategies show greater individual contributions. From the summary of standardized beta coefficients in Table 5b above, the two Mid-range supply chain strategies that have a positive effect (positive beta value) on the firm’s performance outcome include: mid-range supply chain strategies that allows the firm’s assets and operations to react to emerging customers trends at each node of the supply chain (Nano-Chain supply chain strategy); and mid-range supply chain strategies where numerous internal and external activities are coordinated to conform to the overall business strategy (Tie down the firm supply chain strategy). The two riskiest Mid-range supply chain strategies for the firm’s performance are those mid-range supply chain strategies where the firm evaluates opportunities to outsource areas that are not their core competencies in the supply chain (Third-party SC strategy); and mid-range supply chain strategies where the firm does not have or

pursue a formal supply chain strategy (No need for supply chain strategy).

The analysis in Table 5a and 5b above show that the Mid-range supply chain strategies have a positive relationship with firm performance with a correlation coefficient of $R = .545(a)$ and $R^2 = 0.297$. This implies that 30% of the variance in firm performance is explained by the Mid-range supply chain strategies. Given that $\alpha = 5\%$, the F value of 2.218 is not significant (sign. = 0.102) hence Mid-range supply chain strategies are not good predictors of the firm’s performance. Hence, H_a is Accepted.

Hb: Long-range SC Strategies are positively related to Firm Performance

The results of Spearman’s correlation showed a correlation coefficient of $r = 0.690$, $p < 0.01$. The multiple regression analysis is presented in Table 6 below.

Table 6: Regression Model Summary Results for Long-Range Supply Chain Strategies and Firm Performance

| | R | R Square | Std. Error of the Estimate | F | Sig. |
|---------------------|---------|----------|----------------------------|-------|---------|
| Model No. 8b | .858(a) | .735 | 8.76469 | 3.011 | .030(a) |

Source: Research Data, 2014

a Predictors: (Constant), Long-Range Supply chain strategies

b Dependent Variable: Firm Performance

Based on the beta values for the twelve long-range supply chain strategies that show greater individual contributions to the firm’s performance, the strategies that have a positive effect (positive beta value) on firm’s performance include: long-range supply chain strategies where the firm continuously plans its supply chain network to limit exposure to cost fluctuations (Efficient Supply Chain strategy, Beta = .610); long-range supply chain strategies focused on variable productivity to meet speculative purchasing and sales promotion (Innovation supply chain strategy, Beta = .421) long-range supply chain strategies responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them (Demand supply chain strategy, Beta = .368); long-range supply chain strategies that allows the firm to cost effectively receives and delivers products as the sources of supply and customer

change (Project logistics supply chain strategy, Beta = .240); long-range supply chain strategies where the firm creates additional relationship with supply chain members at the point where their operation interact (Synergistic SC strategy, Beta = .183); and lastly long-range supply chain strategies that allows the firm and supply chain members to adopt to different products of different segment of the market (Speed to market supply chain strategy, Beta = -.094).

The most risky long-range supply chain strategies for the firm’s performance are those long-range supply chain strategies aimed at speeding and retaining cash flow for the firm (Cash-to-cash cycle supply chain strategy, Beta = -.161); long-range supply chain strategies directed to minimizing risks like production capacity, quality, floods and earthquakes in the process of procurement, production and distribu-

tion (Risk-hedging Supply Chain strategy, Beta = -.189); long-range supply chain strategies that provides balance of flexibility and cost efficiency in the supply chain while meeting the requirements of the marketplace requirements (Value chain strategy, Beta = -.211); long-range supply chain strategies that increases the firm's ability to mass-maximize and build close relations with customers when designing new and modifying existing products (Market dominance and backlog supply chain strategy, Beta = -.301); and long-range supply chain strategies that are reactive to procurement, production and distribution in dynamic environments to answer to customer needs (Micro-chain supply chain strategy, Beta = -.404).

The analysis in Table 6 above show that the long-range supply chain strategies have a strong positive effect on firm performance with a correlation coefficient of $R = 0.858$ (a) and $R^2 = 0.735$. This implies that 74% of the variance in firm performance is partly explained by the long-range supply chain strategies. Both Mid-range and long-range supply chain strategies explain 76% of the variance in firm performance, meaning it is the long-range supply chain strategies that contribute most to the firm's performance. Given that $\alpha = 5\%$, the F value of 3.011 is significant (sign. = 0.030) the long-range supply chain strategies are good predictors of the firm's performance. Hence, Hb is Accepted.

4. DISCUSSION OF THE FINDINGS

Scholarly research should contribute to and extend the current literature by filling in existing gaps for both researchers and managers (Kirchoff, 2011; Varadarajan, 2003). This section discusses the findings guided by the primary research objectives and hypotheses. This study aimed at establishing the relationship between SC strategies and performance of large-scale manufacturing firms in Kenya. Two sub-hypotheses were derived from this objective. The hypotheses tested the relation between Mid-range and long-range supply chain strategies with firm performance.

Most previous conceptual and qualitative research has focused on the strategy content with general guidelines, but the influence of these strategies on the relationship between supply chain strategies and firm performance has neither been thoroughly underpinned with theory nor analyzed through empirical research (Chopra & Meindl, 2007). The results

supported the hypothesized relationships except in the case of Mid-range supply chain strategies that don't have much support for firm performance. This empirical evidence is, therefore, a major contribution the specific supply chain strategies (not content) and their relationship firm performance.

Although, most previous studies have examined the concept of supply chain strategy and firm performance, there are very few of them on supply chain strategy and even fewer studies about the relationship between supply chain strategy and firm performance (Gudnason & Riis, 1984). This study has indeed taken this opportunity to confirm that there is a positive and significant relationship between supply chain strategies and firm performance. This clears the contradiction by Menor, Kristal, & Rosenzweig (2007) that the investment in supply chain strategy is associated with increased costs, and it does not translate to improved firm performance.

Mid-range SC strategies are not good predictors of firm performance. Particularly, the supply chain strategies that focus on conformance have a negative effect on the firm's performance as they deny the firm some level of flexibility to adjust to the changes in its environment of operation. It is only the investment on long-range SC strategies that can lead to improved firm performance levels. The riskiest long-range SC strategies for the firm's performance are those long-range supply chain strategies aimed at speeding and retaining cash flow for the firm. This relationship between SC strategies and firm performance is based on data collected over a period of five years. The use of secondary data especially for firm performance metrics is a big strength in explaining the causal relationships. This provided an opportunity to peruse the firm manuals and financial reports to crosscheck the achievements in firm performance. This was to fill the gaps identified by Sánchez & Pérez (2005) which indicated that most studies in firm performance have used cross-sectional data, which are limited in order to explain causal relationships; with failure to use any secondary data to crosscheck firm performance. The study findings agree with the conclusions that supply chain practices have a significant effect on firm performance (Golicic & Smith, 2013; Khan & Pillania, 2008; Lee et al., 2012; Li et al., 2006)

This study used a balanced scorecard to measure firm performance. This affirms that the best way to measure the implementation of any strategy and yield valid results is through the use of the Balanced

Scorecard. This findings are supported by Kaplan & Norton (1992) conclusion that a Balanced Scorecard supports management to improve the financial performance of the enterprise where failure translates the improved operational performance into improved financial performance that send executives back to the drawing board to rethink the company's strategy or its implementation plans.

5. CONCLUSIONS

There is a strong and significant relationship between supply chain strategy and the firm's performance where Supply chain strategies explain 76.7 % of the changes in the firm's performance.

5.1. Contributions to Knowledge

By empirically testing the extent to which supply chain strategies are associated to firm and supply chain performance, the present study adds to academic knowledge in several ways by proving empirical evidence pointing towards the significant use of supply chain strategies that will lead to different levels of achievement in firm performance. The inclusion of the construct supply chain strategy in this study contributes to both the operations management and SCM literature as both the operationalization and empirical testing of supply chain strategy has only been investigated in the strategic management and marketing literature. This study of supply chain strategy within operations management was motivated by premise presented by Boyer & Pagell (2000) and Chan & Qi (2003) that there is need for empirical research that will give an extension of the operations strategy perspective towards the more recent supply chain thinking.

Certain strategies are developed and implemented by firms due to stakeholder pressure, regulatory demands, social legitimacy, and the perceived direct economic benefits. However, the economic benefits and motivation for implementing SC strategies have rarely been tested empirically (Thun & Müller, 2010; Zhu, Sarkis, & Lai, 2008). The findings in this study represent the first empirical study that has found a significant relationship between SC strategies and firm performance improvements. This indicates that firms use SC strategies to improve their financial stewardships, service delivery, operations and customer dynamics that are multiple dimensions related to firm performance. This study also widens the avenue for further research on the moderating role

of SCT on the relationship between SC strategies and firm performance. Scholars can use the results to extend performance metrics, study comparisons of different sample sets, and look at longitudinal data for break-even points on the number of SC strategies and technologies implementation.

The findings from this empirical study provide evidence that the RBV of the firm is an important theory in the study of the relationship between SC strategies to firm performance. This extends the conceptual and empirical research in areas related to SC strategy by suggesting that firms with enough capabilities and resources may be more likely to implement SC strategies and realize improvement in firm performance, compared to the competition. Based on the conclusions by Puri (2013) and that most empirical research on the relationship between supply chain practices and firm performance is limited in number and often with conflicting findings, this current study had set out to conclusively and empirically investigate the role of technology in the relationship between SC strategies and firm performance. This empirical study has contributed to a greater understanding of the relationship between SC strategies and firm performance to the current knowledge in this area.

5.2. Future Research Directions

The limitations in the previous section can be addressed but beyond that, there are a number of interesting and exciting future research possibilities based on the findings from this study. While the objective of this study was achieved, the future research in an effort to enhance the conclusions of this study's findings by focusing on other variables like risk management strategies as a moderator on the relationship between SC strategies and firm performance. This study focused on supply chain strategies that could cut across procurement, value creation and distribution. Future studies can narrow their focus to procurement strategies, value creation strategies, and distribution strategies by comparing their impact on firm performance.

The data collected for firm performance was quantitative in nature. This was in response to Awino's (2011) suggestion that in order to provide a rich research database for future research, future study may explore alternative performance measurement indicators of the quantitative nature, such as financial measures, accounting measures, balance score-

cards, linkages to financial statements amongst others. These secondary data was not easy to get. The firms indicated that it was classified information while other indicated that was confidential, hence giving the researcher tough conditions in its use.

6. REFERENCES

- Agha, S., Alrubaiee, L., & Jamhour, M. (2011). Effect of Core Competence on Competitive Advantage and Organizational Performance. *International Journal of Business and Management*, 7(1), 192–204. <http://doi.org/10.5539/ijbm.v7n1p192>
- Bhagwat, R., & Sharma, M. K. (2007). Performance measurement of supply chain management: A balanced scorecard approach. *Computers and Industrial Engineering*, 53(1), 43–62. <http://doi.org/10.1016/j.cie.2007.04.001>
- Bolo, A. Z. (2011). An empirical investigation of selected strategy variables on firms performance : A study of supply chain management in large private manufacturing firms in Kenya. *Business Administration and Management*, 3(October), 228–236.
- Boyer, K. K., & Pagell, M. (2000). Measurement issues in empirical research: Improving measures of operations strategy and advanced manufacturing technology. *Journal of Operations Management*, 18(3), 361–374. [http://doi.org/10.1016/S0272-6963\(99\)00029-7](http://doi.org/10.1016/S0272-6963(99)00029-7)
- Burgess, K., Singh, P. J., & Koroglu, R. (2006). Supply chain management: a structured literature review and implications for future research. *International Journal of Operations & Production Management*, 26(7), 703–729. <http://doi.org/10.1108/01443570610672202>
- Chan, F. T. S., & Qi, H. J. (2003). An innovative performance measurement method for supply chain management. *Supply Chain Management: An International Journal*, 8(3), 209–223. <http://doi.org/10.1108/13598540310484618>
- Chopra, S., & Meindl, P. (2007). *Supply Chain Management: Strategy, Planning and Operation*, (3rd ed.). Pearson Prentice Hall.
- Collins, J. D., Worthington, W. J., Reyes, P. M., & Romero, M. (2010). Knowledge management, supply chain technologies, and firm performance. *Management Research Review*, 33(10), 947–960. <http://doi.org/10.1108/01409171011083969>
- Cooper, M. C., & Ellram, L. M. (1993). Characteristics of Supply Chain Management and the Implications for Purchasing and Logistics Strategy. *The International Journal of Logistics Management*, 4(2), 13–24. <http://doi.org/10.1108/09574099310804957>
- Cousins, P. D., Lawson, B., & Squire, B. (2006). Supply chain management: theory and practice – the emergence of an academic discipline? *International Journal of Operations & Production Management*, 26(7), 697–702. <http://doi.org/10.1108/01443570610672194>
- Ezirim, A. C. ., & Nwokah, N. G. . (2009). Firms entrepreneurial orientation and export marketing performance in the Nigerian non-oil sector. *European Journal of Scientific Research*, 35(3), 318–336.
- Fawcett, S. E., Ogden, J. a., Magnan, G. M., & Cooper, M. B. (2006). Organizational commitment and governance for supply chain success. *International Journal of Physical Distribution & Logistics Management*, 36(1), 22–35. <http://doi.org/10.1108/09600030610642913>
- Gattorna, J. (2006). Living supply chains: how to mobilize the enterprise around delivering what your customers want. *Financial Times Series (1st ed.)*. Prentice Hall. <http://doi.org/10.273-70614-4>
- GoK. (2007). *Kenya Vision 2030: A Globally Competitive and Prosperous Kenya*. Government of Kenya, National Economic and Social Council (NESC). Nairobi, Kenya.
- Golicic, S. L., & Smith, C. D. (2013). A Meta-Analysis of Environmentally Sustainable Supply Chain Management Practices and Firm Performance. *Journal of Supply Chain Management*, 49(2), 78–95.
- Gudnason, C., & Riis, J. (1984). *Manufacturing strategy*. Omega (Vol. 12). [http://doi.org/10.1016/0305-0483\(84\)90057-4](http://doi.org/10.1016/0305-0483(84)90057-4)
- Gunasekaran, A., Patel, C., & Tirtiroglu, E. (2001). Performance measures and metrics in a supply chain environment. *International Journal of Operations & Production Management*, 21(1/2), 71–87. <http://doi.org/10.1108/01443570110358468>
- Halley, A., & Beaulieu, M. (2009). Mastery of operational competencies in the context of supply chain management. *Supply Chain Management: An International Journal*, 14(1), 49–63. <http://doi.org/10.1108/13598540910927304>
- Hines, T. (2009). *Supply chain strategies: customer driven and customer focussed (2nd ed.)*. Routledge. <http://doi.org/10.4324/9780203631669>
- Hult, G. T. M., Ketchen, D. J., Cavusgil, S. T., & Calantone, R. J. (2006). Knowledge as a strategic resource in supply chains. *Journal of Operations Management*, 24(5), 458–475. <http://doi.org/10.1016/j.jom.2005.11.009>
- Johnson, G., Scholes, K., & Whittington, R. (2007). *Exploring Corporate Strategy*. (8th ed.). Prentice Hall. [http://doi.org/10.1016/0142-694X\(85\)90029-8](http://doi.org/10.1016/0142-694X(85)90029-8)
- Kamaruddin, N. K., & Udin, Z. M. (2009). Supply chain technology adoption in Malaysian automotive suppliers. *Journal of Manufacturing Technology Management*, 20(3), 385–403. <http://doi.org/10.1108/17410380910936819>
- Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard - measure that drive performance. *Harvard Business Review*, 70(1), 71–79.
- Kate Cowles. (2006). *Statistical Methods and Computing: Sample size for confidence intervals with known t Intervals*. IOWA.
- Keegan, D. P., Eiler, R. G., & Charles, R. J. (1989). Are your performance measures obsolete? *Management Accounting*, 70(12), 45–50. <http://doi.org/10.1177/004057368303900411>
- Ketchen, D. J., & Giunipero, L. C. (2004). The intersection of strategic management and supply chain management. *Industrial Marketing Management*, 33(1), 51–56. <http://doi.org/10.1016/j.indmarman.2003.08.010>

- Khan, A., & Pillania, R. (2008). Strategic sourcing for supply chain agility and firms' performance: A study of Indian manufacturing sector. *Management Decision*, 46(10), 1508–1530. <http://doi.org/10.1108/00251740810920010>
- Kidombo, H. (2007). Human Resource Strategic Orientation, Organizational Commitment and Firm Performance in Large Private Manufacturing Firms in Kenya. University of Nairobi.
- Kirchoff, J. F. (2011). A Resource-Based Perspective on Green Supply Chain Management and Firm Performance. University of Tennessee.
- Lars-Erik Gadde, Hakan Hakansson, G. P. (2001). *Supply Network Strategies* (2nd ed.). West Sussex, UK: John Wiley & Sons.
- Lee, S. M., Kim, S. T., & Choi, D. (2012). Green supply chain management and organizational performance. *Industrial Management & Data Systems*, 112(8), 1148–1180. <http://doi.org/DOI 10.1108/02635571211264609>
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107–124. <http://doi.org/10.1016/j.omega.2004.08.002>
- Menor, L. J., Kristal, M. M., & Rosenzweig, E. D. (2007). Examining the Influence of Operational Intellectual Capital on Capabilities and Performance. *Manufacturing & Service Operations Management*, 9(4), 559–578. <http://doi.org/10.1287/msom.1060.0131>
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining Supply Chain Management. *Journal of Business Logistics*, 22(2), 1–25. <http://doi.org/10.1002/j.2158-1592.2001.tb00001.x>
- Neely, A., Bourne, M., & Kennerley, M. (2000). Performance measurement system design: developing and testing a process-based approach. *International Journal of Operations & Production Management*, 20(10), 1119–1145. <http://doi.org/10.1108/01443570010343708>
- Neuman, W. L. (2009). *Social Research Methods: Qualitative and Quantitative Approaches* (7th ed.). Pearson.
- Okoth, J. (2012, February 17). Are multinationals leaving Kenya? *The Financial Post*: Bruce House, Standard Street. Nairobi.
- Ou, C. S., Liu, F. C., Hung, Y. C., & Yen, D. C. (2010). A structural model of supply chain management on firm performance. *International Journal of Operations & Production Management*, 30(5), 526–545. <http://doi.org/10.1108/01443571011039614>
- Patterson, K. a., Grimm, C. M., & Corsi, T. M. (2003). Adopting new technologies for supply chain management. *Transportation Research*, E 39, 95–121. [http://doi.org/10.1016/S1366-5545\(02\)00041-8](http://doi.org/10.1016/S1366-5545(02)00041-8)
- Puri, G. (2013). Factors affecting the Adoption of B2B E-commerce – An Empirical Study, 6(1), 13–22.
- PwCIL. (2010). *Industrial Manufacturing: A brief overview of the industrial manufacturing sector in Kenya*. Nairobi, Kenya.
- Qrunfleh, S., & Tarafdar, M. (2014). Supply chain information systems strategy: Impacts on supply chain performance and firm performance. *International Journal of Production Economics*, 147(PART B), 340–350. <http://doi.org/10.1016/j.ijpe.2012.09.018>
- Russell, D. M., & Hoag, A. M. (2004). People and information technology in the supply chain: Social and organizational influences on adoption. *International Journal of Physical Distribution & Logistics Management*, 34(2), 102–122. <http://doi.org/10.1108/09600030410526914>
- Sánchez, A. M., & Pérez, M. P. (2005). Supply chain flexibility and firm performance: A conceptual model and empirical study in the automotive industry. *International Journal of Operations & Production Management*, 25(7), 681–700. <http://doi.org/10.1108/01443570510605090>
- Stiles, J. (2003). A philosophical justification for a realist approach to strategic alliance research. *Qualitative Market Research: An International Journal*, 6(4), 263–271. <http://doi.org/10.1108/13522750310495346>
- Teeratsirikool, L., Siengthai, S., Badir, Y., & Charoenngam, C. (2013). Competitive strategies and firm performance: the mediating role of performance measurement. *International Journal of Productivity and Performance Management*, 62(2), 168–184. <http://doi.org/10.1108/17410401311295722>
- Thun, J.-H., & Müller, A. (2010). An Empirical Analysis of Green Supply Chain Management in the German Automotive Industry. *Business Strategy and the Environment*, 19(2), 119–132. <http://doi.org/10.1002/bse>
- Tomaskovic-devey, D., Leiter, J., Thompson, S., Quarterly, A. S., Sep, N., & Tomaskovic-, D. (2007). Organizational Survey Nonresponse Organizational Survey Nonresponse Devey , Shealy Thompson. *Science*, 39(3), 439–457.
- Umma, S. (2006). *Research methods for business* (4th ed.). Wiley India Pvt.
- Varadarajan, P. R. (2003). Musings on Relevance and Rigor of scholarly research in marketing. *Journal of the Academy of Marketing Science*, 31(4), 368–376.
- Varma, S., Wadhwa, S., & Deshmukh, S. G. (2006). Implementing supply chain management in a firm: issues and remedies. *Asia Pacific Journal of Marketing and Logistics*, 18(3), 223–243. <http://doi.org/10.1108/13555850610675670>
- Wilson, E. J., & Lilien, G. L. (1992). Using single informants to study group choice: An examination of research practice in organizational buying. *Marketing Letters*, 3(3), 297–305. <http://doi.org/10.1007/BF00994137>
- Zhu, Q., Sarkis, J., & Lai, K. (2008). Green supply chain management implications for “closing the loop.” *Transportation Research Part E: Logistics and Transportation Review*, 44(1), 1–18. <http://doi.org/10.1016/j.tre.2006.06.003>
- Zolait, A. H., Ibrahim, A. R., Chandran, V. G. R., Pandiyan, V., & Sundram, K. (2010). Supply chain integration: an empirical study on manufacturing industry in Malaysia. *Journal of Systems and Information Technology*, 12(3), 210–221. <http://doi.org/10.4018/jtd.2010070103>

Annex I: Regression Coefficients (a) for Supply Chain Strategies and Firm Performance

| Model | Indicators: Objective i (Data Analysis Model #i) | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|--------------------------------|---------------|------------------------------|---------------|-------------|
| | | B | Std. Error | Beta | | |
| Model # 1 | | | | | | |
| | (Constant) | 29.97 | 4.746 | | 6.315 | .000 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 7.70 | 1.171 | .545 | 6.571 | .000 | |
| Model # 2 | (Constant) | -58.61 | 16.941 | | -3.459 | .001 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 7.77 | 1.037 | .551 | 7.491 | .000 | |
| SC a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 17.93 | 3.323 | .397 | 5.397 | .000 | |
| Model # 3 | (Constant) | -24.41 | 18.522 | | -1.318 | .191 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 9.58 | 1.096 | .679 | 8.734 | .000 | |
| A SC a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 16.52 | 3.160 | .365 | 5.227 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -7.15 | 1.956 | -.286 | -3.658 | .000 | |
| Model # 4 | (Constant) | -32.42 | 17.673 | | -1.835 | .070 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation supply chain strategy | 7.01 | 1.264 | .497 | 5.543 | .000 | |
| SC a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 17.44 | 3.002 | .386 | 5.809 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -8.24 | 1.876 | -.330 | -4.395 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 5.02 | 1.410 | .312 | 3.557 | .001 | |
| Model # 5 | (Constant) | 11.64 | 20.132 | | .578 | .564 |
| A supply chain strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 7.19 | 1.185 | .510 | 6.070 | .000 | |
| SC strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways | 15.69 | 2.849 | .347 | 5.507 | .000 | |

| Model | Indicators: Objective i (Data Analysis Model #i) | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--|---|--------------------------------|---------------|------------------------------|--------------|-------------|
| | | B | Std. Error | Beta | | |
| that are efficient for them: LR Demand SC strategy. | | | | | | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -9.64 | 1.795 | -.386 | -5.373 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 6.51 | 1.377 | .405 | 4.727 | .000 | |
| A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy | -7.36 | 1.913 | -.257 | -3.847 | .000 | |
| Model # 6 | (Constant) | 22.55 | 19.389 | | 1.163 | .248 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 7.18 | 1.126 | .509 | 6.374 | .000 | |
| SC a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 14.34 | 2.734 | .317 | 5.245 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -8.45 | 1.740 | -.338 | -4.853 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 7.81 | 1.362 | .486 | 5.732 | .000 | |
| A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy | -7.13 | 1.818 | -.249 | -3.921 | .000 | |
| A strategy that increases the firm's ability to mass-maximize and build close relations with customers when designing new and modifying existing products: LR Market dominance and backlog SC strategy | -3.95 | 1.159 | -.232 | -3.408 | .001 | |
| Model # 7 | (Constant) | 28.09 | 18.603 | | 1.510 | .134 |
| A supply chain strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 6.99 | 1.077 | .496 | 6.497 | .000 | |
| Supply chain a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 12.752 | 2.659 | .282 | 4.796 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR | -9.31 | 1.684 | -.373 | -5.529 | .000 | |

| Model | Indicators: Objective i (Data Analysis Model #i) | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--|---|--------------------------------|---------------|------------------------------|--------------|-------------|
| | | B | Std. Error | Beta | | |
| Micro-chain SC strategy | | | | | | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 7.42 | 1.307 | .462 | 5.679 | .000 | |
| A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy | -7.276 | 1.737 | -.254 | -4.188 | .000 | |
| A strategy that increases the firm's ability to mass-maximize and build close relations with customers when designing new and modifying existing products: LR Market dominance and backlog SC strategy | -4.63 | 1.127 | -.271 | -4.103 | .000 | |
| A strategy where the firm evaluates opportunities to outsource areas that are not their core competencies in the supply chain: MR Third-party SC strategy | 3.19 | .997 | .199 | 3.207 | .002 | |
| Model # 8 | (Constant) | 26.26 | 18.127 | | 1.449 | .151 |
| A supply chain strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 6.81 | 1.051 | .483 | 6.480 | .000 | |
| SC a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 13.39 | 2.601 | .296 | 5.147 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -9.64 | 1.645 | -.386 | -5.861 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics supply chain strategy | 6.09 | 1.378 | .379 | 4.420 | .000 | |
| A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy | -7.06 | 1.694 | -.247 | -4.170 | .000 | |
| A strategy that increases the firm's ability to mass-maximize and build close relations with customers when designing new and modifying existing products: LR Market dominance and backlog SC strategy | -5.73 | 1.183 | -.336 | -4.845 | .000 | |
| A strategy where the firm evaluates opportunities to outsource areas that are not their core competencies in the supply chain: MR Third-party SC strategy | 3.012 | .973 | .188 | 3.102 | .003 | |
| A strategy where the firm continuously plans its supply chain network to limit exposure to cost fluctuations: LR Efficient SC strategy | 2.56 | 1.023 | .200 | 2.504 | .014 | |
| Model # 9 | (Constant) | 26.41 | 17.590 | | 1.502 | .137 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales | 7.19 | 1.030 | .510 | 6.982 | .000 | |

| Model | Indicators: Objective i (Data Analysis Model #i) | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--|---|--------------------------------|---------------|------------------------------|--------------|-------------|
| | | B | Std. Error | Beta | | |
| promotion: LR Innovation SC strategy | | | | | | |
| SC a strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 14.26 | 2.546 | .315 | 5.600 | .000 | |
| A supply chain strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain supply chain strategy | -9.89 | 1.599 | -.396 | -6.185 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 7.76 | 1.480 | .483 | 5.241 | .000 | |
| A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy | -8.65 | 1.752 | -.303 | -4.940 | .000 | |
| A strategy that increases the firm's ability to mass-maximize and build close relations with customers when designing new and modifying existing products: LR Market dominance and backlog SC strategy | -6.50 | 1.185 | -.381 | -5.486 | .000 | |
| A strategy where the firm evaluates opportunities to outsource areas that are not their core competencies in the SC: MR Third-party SC strategy | 4.51 | 1.103 | .281 | 4.094 | .000 | |
| A strategy where the firm continuously plans its SC network to limit exposure to cost fluctuations: LR Efficient SC strategy | 3.83 | 1.104 | .299 | 3.471 | .001 | |
| A SC strategy that allows the firm and supply chain members to adopt to different products of different segment of the market: LR Speed to market SC strategy. | -2.89 | 1.101 | -.258 | -2.626 | .010 | |
| Model # 10 | (Constant) | 38.23 | 17.878 | | 2.139 | .035 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | | | | | | |
| SC strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 13.97 | 2.488 | .309 | 5.616 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -10.32 | 1.572 | -.413 | -6.567 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 8.56 | 1.484 | .533 | 5.769 | .000 | |

| Model | Indicators: Objective i (Data Analysis Model #i) | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--|---|--------------------------------|---------------|------------------------------|--------------|-------------|
| | | B | Std. Error | Beta | | |
| Third-party SC strategy | | | | | | |
| A strategy where the firm continuously plans its SC network to limit exposure to cost fluctuations: LR Efficient SC strategy | 4.82 | 1.095 | .376 | 4.400 | .000 | |
| A SC strategy that allows the firm and SC members to adopt to different products of different segment of the market: LR Speed to market SC strategy. | -3.39 | 1.061 | -.303 | -3.195 | .002 | |
| A SC strategy where numerous internal and external activities are co-ordinated to conform to the overall business strategy: MR Tie down the firm SC strategy | -3.64 | 1.351 | -.162 | -2.690 | .008 | |
| A strategy where the firm creates additional relationship with SC members at the point where their operation interact: LR Synergistic SC strategy | 2.22 | .945 | .161 | 2.347 | .021 | |
| Model # 12 | (Constant) | 55.14 | 17.918 | | 3.078 | .003 |
| A SC strategy focused on variable productivity to meet speculative purchasing and sales promotion: LR Innovation SC strategy | 5.69 | 1.009 | .403 | 5.633 | .000 | |
| SC strategy responsive and flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them: LR Demand SC strategy. | 15.53 | 2.367 | .343 | 6.561 | .000 | |
| A SC strategy that is reactive to procurement, production and distribution in dynamic environments to answer to customer needs: LR Micro-chain SC strategy | -13.02 | 1.597 | -.521 | -8.155 | .000 | |
| A strategy that allows the firm to cost effectively receives and delivers products as the sources of supply and customer change: LR Project logistics SC strategy | 6.99 | 1.452 | .435 | 4.817 | .000 | |
| A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy | -6.87 | 1.669 | -.240 | -4.119 | .000 | |
| A strategy that increases the firm's ability to mass-maximize and build close relations with customers when designing new and modifying existing products: LR Market dominance and backlog SC strategy | -7.321 | 1.179 | -.429 | -6.207 | .000 | |
| A strategy where the firm evaluates opportunities to outsource areas that are not their core competencies in the supply chain: MR Third-party SC strategy | 4.989 | 1.007 | .310 | 4.951 | .000 | |
| A strategy where the firm continuously plans its supply chain network to limit exposure to cost fluctuations: LR Efficient SC strategy | 9.35 | 1.678 | .729 | 5.572 | .000 | |
| A SC strategy that allows the firm and supply | -3.41 | 1.004 | -.304 | -3.393 | .001 | |

| Model | Indicators: Objective i (Data Analysis Model #i) | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--|---|--------------------------------|---------------|------------------------------|------|------|
| | | B | Std. Error | Beta | | |
| chain members to adopt to different products of different segment of the market: LR Speed to market SC strategy. | | | | | | |
| A SC strategy where numerous internal and external activities are co-ordinated to conform to the overall business strategy: MR Tie down the firm SC strategy | -5.26 | 1.363 | -.235 | -3.857 | .000 | |
| A strategy where the firm creates additional relationship with SC members at the point where their operation interact: LR Synergistic SC strategy | 3.601 | .980 | .261 | 3.673 | .000 | |
| A SC strategy directed to minimizing risks like production capacity, quality, floods and earthquakes in the process of procurement, production and distribution: LR Risk-hedging SC strategy | -6.42 | 1.868 | -.348 | -3.434 | .001 | |

Source: Research Data, 2014

a Dependent Variable: Firm Performance

Method: Stepwise (Criteria: Probability-of-F-to-enter \leq .050, Probability-of-F-to-remove \geq .100).

Auhtor's Biography:

Richard Nyaoga is a Lecturer in the Faculty of Commerce Department of Accounting, Finance and Management Science of Egerton University-Kenya. Richard has a wide experience in teaching spanning over seven years. Richard has widely published in various peer reviewed journals. Richard has an Undergraduate and Masters Degrees from The University of Nairobi Kenya and a PhD in Management Science.

Peterson Magutu is a Lecturer in The University of Nairobi. He has taught, published and consulted widely on Management Science related areas. Dr. Magutu has An Undergraduate, Master and PhD both from the University of Nairobi. Magutu's research interests lie in developing and testing basic models used in operations management and management science especially in supply chain management.

Josiah Aduda is currently the Associate Professor and Dean of the school of business University of Nairobi. Dr. Aduda has wide experience in teaching and publishing in areas of Management. He has undergraduate & Masters from University of Nairobi and a PhD from Univeristy of Dar es Salaam- Tanzania.