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

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Abstract

Both supply chain strategies and supply chain performance are evolving areas of research. Most research findings on the relationship between supply chain strategies and supply chain performance have been contradicting but no attempt to clear the contradictions. The purpose of this paper is to establish the relationship between supply chain strategies and supply chain performance outcome among large-scale manufacturing firms in Kenya. This was at firm level as the unit of analysis, using the Resource Based View theoretical underpinning.

A sample of one hundred and thirty eight (138) firms was drawn using proportionate sampling from a total population of six hundred and twenty seven (627) large scale manufacturing firms in Kenya. The response rate was seventy five percent. Descriptive statistics, reliability and validity tests of the constructs, correlation analysis, factor analysis and regression analysis models were used to test the hypotheses. Preliminary tests employed Kaiser Mayer-Olkim (KMO) and Barlett's test. The study's KMO measure is 0.849, a value indicating sampling adequacy as the Barlett's test of sphericity is significant with its associated probability is less than 0.00.

The findings indicated that there is a strong and significant relationship between supply chain strategy and the firm's supply chain performance, where supply chain strategies alone are able to explain 51.3 percent of variance in the firm's supply chain performance.

The study suggested on future research considerations for additional variables, external validity and qualitative research approach aimed at extending the research.

Keywords: Supply chain management, supply chain strategies and supply chain performance

Introduction

A supply chain is a well coordinated system that should deliver a product package from the source as raw materials until it reaches the end customer. Supply Chain Management's (SCM's) main focus is on number of facilities, partners and activities that must be managed to meet utilities of time, place, quantity and the least cost for the whole supply chain (SC). Proper optimization of the supply chain where all costs are minimized to enhance customer value creates high levels of efficiency and effectiveness in the firm's supply chain. An optimized supply chain is made up of competitive firms. For any firm to be competitive, there is need to consider the supply

chain strategy when crafting its overall business level strategy (Gadde, 2001). Owing to lack of consensus on definition and differing views on the concept of SCM, this study was guided by Mentzer and colleagues' (2001) definition, which is broad enough and captures issues of strategy and firm's performance. They (Mentzer et. al., 2001: 18) 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."

Supply chain strategy is not the same as the concept of SCM. SC strategy defines how the network of facilities should operate in order to compete through operational components. In SCM, focus is on cost-reduction using certain controls (Happek, 2005).

The resource based view and transactional theories have played a very key role when conducting research on strategic perspectives of operations and supply chain management (Kevin, Prakash, and Rana, 2006). The resource based view theory has been greatly used in SC management studies in the last twenty years. This theory has, to a great extent, shaped mastery of operational decisions in the context of SC management (Grimm, 2004; Alain and Martin, 2009). This study was guided by the resource based view theory.

The Kenya's Vision 2030 has highlighted that the large-scale manufacturing subsector has a good potential for growth and international competitiveness (PwCIL, 2010; GoK, 2007). However, targeting replacement of external suppliers as envisioned might kill the spirit of global competition and affect product variety in the Kenyan market. This study is a build up on Vision 2030's manufacturing sector five year rolling plan

starting from 2012. The plan is aimed at increasing the Gross Domestic (GDP) by ten percent by enhancing local productivity and a fifteen percent saturation of Kenyan markets with locally manufactured products. Hines (2004: 76) defines 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. There are several benefits, challenges and relative complexity for each of these sixteen supply chain strategies. They 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. The pattern has led to categorization of the sixteen supply chain strategies into a dichotomy of long-range and mid-range supply chain strategies (Gattorna, 2007; Gadde, 2001). The sixteen-supply chain strategy dichotomy was central in this study in relation to supply chain performance. This study considered both direct effect of long-range and mid-range supply chain strategies on the supply chain performance of large-scale manufacturing firms in Kenya.

Performance of business units and functional areas in any business will

affect the firm's SC performance. Indeed, allocation of resources in order to achieve business objectives in an organization is based on expected results from the business units that will cumulatively determine overall firm's competitiveness (Smith and Goddard, 2002; Chen and Paulraj, 2004).

Organizations in today's business environment have a big challenge on how to remain competitive in the market place through supply chain performance. Therefore, supply chain performance can be measured on its own (Smith and Goddard, 2002; Jamie *et. al*., 2010). Some authors (Keegan *et. al*., 1989; Kaplan and Norton, 1992) have suggested appropriate supply chain performance measurement frameworks. They include performance measurement matrix and balanced scorecard (BSC). The performance measurement matrix as advanced by Keegan and colleagues (1991) ranks activities in matrix form but it does not assign weights and hence, the name. Supply chain performance is measured alongside firm's performance (Chen and Paulraj, 2004). According to Beamon (1999), the two key measures of supply chain performance are resource measures and outcome measures. Resource measures include: inventory levels; equipment utilization; energy usage; and cost. Outcome measures of supply chain performance include: order lead time; productivity ratio; total cycle time; range of products; and many more (Gunasekaran, 2004; Poluha, 2007). According to Awino (2011), performance measurement should be extended beyond the firm's inbound operations in order to include SC performance measures. This study explored the balanced approach for SC performance outcomes with nine perspectives within the context of large-scale manufacturing firms in Kenya.

Research Problem and Research Focus

SCM has been popularized by several authors as an independent field of study since 1980s, although much of the underlying thinking dates back several decades. This fairly new and emerging concept is now making a

significant appearance in management literature, but its definition is still divergent as different definitions of the concept exist in literature (Stevens, 1989; Gibson, *et. al*., 2000).

The world leading manufacturing firms have moved towards complete waste elimination by adopting SC strategy and value stream mapping as new philosophies of management. As a result of these new management philosophies, it is the critical role of operations management and operations strategy that can determine the manufacturing firm's success (Chase *et. al*., 2009).

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

Chase and colleagues (2009) concluded that efficiency of the SC can affect firm's performance but their small sample calls for further exploration in this direction. In fact, findings from the study by Chase and co-workers (2009) were contradicted by Gattorna (2007) who concludes that some supply chain configurations can inevitably lead to service failures and reduced operational as well as financial performance. As confirmed by Jacobs, Chase and Aquilano (2009), an organization's performance depends on how strategically they manage the SC to meet customer needs.

An expanded approach of sixteen-supply chain strategies dichotomy is in use today and the future shall see firms competing by using their supply chain strategies (Gadde, 2001). Very few studies have attempted to address such an expanded approach of sixteen SC strategies in establishing the

relationship between supply chain strategy and supply chain performance (Russel and Hoag, 2004; Gattorna, 2007). The sixteen-supply chain strategy dichotomy provides an extended approach, whose relationship with SC performance outcomes are the subject of this study.

Weinzimmer, Nystrom, and Freeman (1998) criticised the biased and unbalanced analysis of different measures of supply chain performance. Awino (2011) observed that discussions of SC performance measures are noticeably excluded in most studies on firm's performance. Therefore, most studies have used a limited number of measures that are not objective enough to establish the link between supply chain strategies, supply chain technology and supply chain performance. Particularly, they have not used the balanced score card perspectives to examine supply chain performance, something the current study sought to use. In acknowledging these gaps in literature, this study sought to focus on multiple measures of supply chain performance by using a weighted average performance score and not rated on a scale. This was guided by the following research question: What is the relationship between SC strategies and supply chain performance?

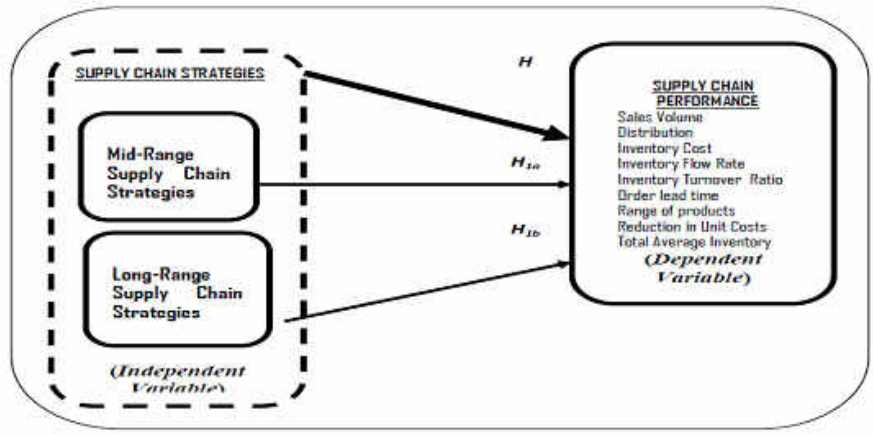
The main objective of this study was to establish the relationship between supply chain strategies and supply chain performance outcome among large-scale manufacturing firms in Kenya.

Conceptual Model and Hypothesis

The conceptual model in Figure 1 is in support for arguments raised from literature review that SC strategies that consist of Mid-range SC strategies and Long-range SC strategies has a relationship with supply chain performance outcome of large-scale manufacturing firms in Kenya.

Figure 1 shows emphasis on an inter-connection between SC strategies and supply chain performance in one comprehensive framework intended to aid the researcher in developing a highly thorough understanding of linkages between the two stated concepts.

Figure 1: *Conceptual Model*



Based on objective of this study, this study examined SC strategies that consist Mid-range SC strategies and Long-range SC strategies as well as their relationship with supply chain performance outcomes of large-scale manufacturing firms in Kenya. Hence, the following hypotheses were tested:

H: *Supply chain strategies are positively related to SC performance outcome.*

Given that the sixteen-supply SC dichotomy (Mid-range SC strategies and Long-range SC strategies) was used as independent variables in relation to SC performance outcome, the following two sub-hypotheses were derived from hypothesis one:

H_{1a}: Mid-range SC strategies are positively related to supply chain performance outcome

H_{1b}: Long-range SC strategies are positively related to supply chain performance outcome

Research Methodology

General Background of Research

Social research is characterized by a number of different perspectives or paradigms. The most commonly referred to are positivism and phenomenology. The paradigm can influence research design and interpretation of the investigation at hand. The two have provided useful insights into most research investigations (Stiles, 2003). According to Kevin, Prakash, and Rana (2006), theories can be tested using a variety of research method paradigmatic stances, which have a big influence on value of subsequent knowledge to be generated. The positivistic paradigm was preferred since it combines static and *a priori* approaches. The positivistic paradigm often requires a test of a model using questionnaires constructed without input(s) from respondents as it was the case for this study. Moreover, this research comprised predefined (*a priori*) relationships that required primarily theory testing like all hypotheses are stated with predictive rigour for acceptance aimed at making positivistic conclusions.

Research Design

This study adapted cross-sectional survey and descriptive design. The design was appropriate because it is useful in establishing nature of existing situations as well as current conditions and also in analyzing such situations plus conditions. Mugenda (2003) contends that cross-sectional studies are appropriate where the overall objective is to establish whether or not significant associations among variables exist at some point in time. Day (1994) used core capabilities as independent variable and performance as

the dependent variable, using a baseline survey methodology. Stanley and colleagues (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. According Sekaran (2000), the positivist paradigm places high priority on identifying causal linkages between and amongst variables. In due regard, cross-sectional survey was used to obtain the empirical data to determine linkages between variables.

Sample and Sample Size

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 categorizations of manufacturing firms according to size have been based on number of employees, the type and level of technology used, size of capital investment and capacity utilization can be used to justify choice of large scale manufacturing firms. The main reason for this choice is that firms are likely to exhibit an elaborate SCM philosophy, exhibit high activity levels, have enough resources to be employed in supply chain strategy implementation as well as 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's performance. Large-scale manufacturing firms that make more than two-thirds of the industrial coverage were considered as strength of this research since prior

studies ignored sector-specific supply chain variables on firm's performance. Recall, focus of the research was on the manufacturing sector in Kenya.

The appropriate sample size for the population-based survey was determined largely by the following three factors (Kate, 2006): (i) the estimated percentage prevalence of the population of interest – 10 percent in this instance based on prevalence by Stanley and Gregory (2001); (ii) the desired level of confidence; and (iii) the acceptable margin of error.

For a survey design based on a simple random sample, the sample size required can be calculated according to the following formula (Kate, 2006):

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

Where:

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

Therefore, sample size (n) for this study was computed as follows:

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

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

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

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

One hundred and thirty eight (138) large scale manufacturing firms were sampled and contacted to participate in the study. In this study, the large-scale manufacturing firms (sample) have been stratified into twelve key sectors/strata as below 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**

Proportionate sampling was done as shown in Table 1 to pick the required number of respondents from the 12 strata. That gave every firm from every location/operation/region/area an opportunity to participate in the study. Having decided on the sample size of 138 large-scale manufacturing firms, a stratified random sampling technique was used to ensure sectoral with some geographical representation although certain industries are clustered in certain towns.

Data Collection Methods

Data for this study were collected from both primary and secondary sources. The two sources of data are meant to reinforce each other (Stiles, 2003). For this study, primary data entailed responses on all study variables: supply chain strategies and supply chain performance. Secondary data, particularly five year historical data on supply chain performance, were 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.

For this study, the questionnaire and data forms were principal tool for collecting primary data and secondary data, respectively. The questionnaire was developed to cover the main research objective. As the unit of analysis was the firm, 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 and Lilien (1992) showed that single informants are most appropriate in non-new task decisions. In due regard, the criterion for choice of a respondent in each firm was that one should be experienced or knowledgeable about supply chain management, operations management decisions and activities of the firm at the time of the survey.

The researchers administered the questionnaires personally. Sharma and colleagues (2009) noted that in order to enhance response rate and quality of data collected, it is better to administer the data collection tools in person and using the official request.

Data Analysis

The positivistic approach to research guided data analysis. Positivism advocates for hypotheses testing using quantitative techniques (Stiles, 2003).

Thus, information required for testing the study hypotheses was generated using quantitative data analytical techniques. Consequently, data analysis followed Sekaran's (2000) four step process: getting data ready for analysis; getting a feel for the data; testing the goodness for the data; and testing the hypotheses.

The researchers used descriptive statistics including measures of central tendency, especially the mean, median and mode for Likert scale variables in the questionnaire. Measures of dispersion especially variance, standard deviation and range were used in order to explore underlying features in the data on large scale manufacturing firms in Nairobi, Kenya. Descriptive statistics covered all response variables as well as respondents' demographic characteristics. Descriptive statistics provide basic features of data collected on variables and provide the impetus for conducting further analyses on the data (Mugenda, 2003; Ezirim and Nwokah, 2009).

A correlation analysis was done to establish relationships among the study variables. In correlation analysis, data were collected on at least two variables for the same group of subjects and a coefficient of correlation calculated between them. The correlation analysis was completed 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. The square of the correlation coefficient, the coefficient of determination (R^2), measured the amount of variation in the dependent variable (firm's performance) explained by the independent variables (supply chain strategy). The closer R^2 is to 1, the better the fit of the regression line to the actual data. A multiple linear regression model was adopted to study the linear relationships among various study variables. The multiple linear regression analysis is a multivariate statistical technique used to estimate model parameters and determine the effect of individual independent variables (IVs) on the dependent variable (DV).

$$\text{Supply Chain Performance (Y)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots + \beta_p X_p + \varepsilon_{i\ldots.\,(i)}$$

Where

Y is one of the Independent variables (Supply Chain Performance) and is a linear function of X1, X2, X3, X4…Xi plus εi .

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

β_0 is the regression constant or intercept

$\beta_{1\text{-}p}$ are regression coefficients or change induced in Y by each X

$X_{1\text{-}p}$ are independent variables (Long-range and Mid-range supply chain strategies)

εi is a random variable, error term that accounts for variability in Y_1 that cannot be explained by the linear effect of the i predictor variables.

Research Results

One the methodological weaknesses of previous studies was small sample sizes and low response rate. This study's response rate of 75 percent is high compared to previous studies, whose average response rate was 65 percent or less. For example, Kidombo (2007) who studied large private manufacturing firms in Kenya had 64 percent response rate; Kirchoff (2011) surveyed the concept of supply chain performance orientation and firm's performance had 184 potential survey participants out of which only 51 completed the survey, leading to a very low response rate of 28 percent. According to Tomaskovic-Devey, Leiter, and Thompson (1994), any response rate of about 15.4 percent is considered as yielding a relatively high response rate considering demands on time of top-level executives. All subsectors of large scale manufacturing sector were well represented in this study, avoiding any chances of bias or misrepresentation.

It was revealed in the study that majority of the firms (68%) have successfully managed their supply chains, while 16 percent saw their supply chains very successful and somewhat successful. This is an indication that the supply chain department exists in most large scale manufacturing firms

(84) and may be managed by specialists who understood about items in the questionnaire were testing and an appropriate response that was required. This implies that only firms that have managed their supply chains have sound strategies to guide their firms' operations.

Supply Chain Performance

Supply chain performance data for each firm were collected and the mean score for all firms was computed for every supply chain outcome item. Once the mean for every item for all firms for each year was computed, it was keyed-in to the performance matrix as shown in Table 4.9. The mean achievement of every indicator for all firms was used to compute the annual weighted supply chain performance outcome for each of the indicators (denoted as model ***i***) under *"SCOWP i = Achievement of Year t * Weight"* as used in model number in the research methodology, for example, the SCOWP *Sales* for 2006= 443*.17 = 75.3.

Table 2: *Supply Chain Performance*

Indicators	Unit of Measure	Weight	ACHIVEMENTS					SCOWP i = Achievement of Year t * Weight...(1)					Supply Chain Outcome I
			2006	2007	2008	2009	2010	2006	2007	2008	2009	2010	
Sales	Kshs. (m)	17	443	515	563	603	659	75.3	87.6	95.8	102.6	112.0	
Total Average Inventory	No. ('000s)	17	334.3	377.5	450.2	353.8	344.8	56.8	64.2	76.5	60.1	58.6	
Reduction in Unit Costs	Kshs. (m)	10	37	40	45	50	56	3.7	4.0	4.5	5.0	5.6	
Inventory Cost	Kshs. (m)	7	147	154	177	214	240	10.3	10.8	12.4	15.0	16.8	
Inventory Turnover Ratio	%	13	38	41	44	47	51	4.9	5.3	5.8	6.1	6.6	
Inventory Flow Rate	%	7	51	56	60	64	60	3.5	3.9	4.2	4.4	4.9	
Order lead time	Days	13	63	60	48	42	38	8.2	7.8	6.2	5.5	4.9	
Range of products	No.	7	24	27	30	34	35	1.7	1.9	2.1	2.4	2.4	
Effectiveness of enterprise distribution	%	10	56	63	69	75	82	5.6	6.3	6.9	7.5	8.2	
Total		**100**	**SCPO…….. (2)**					**170**	**191**	**214**	**209**	**220**	**201**

Source: Research Data, 2014

Summation of overall annual weighted of each indicator was used to determine the yearly/annual (y) supply chain performance outcome as per model number two in the methodology:

SCPO = SCOWP *Sales* + SCOWP *Average Inventory* + SCOWP *Unit Costs* + SCOWP *Inventory Cost* + SCOWP *Turnover Ratio* + SCOWP *Flow Rate* + SCOWP *Inventory Cost* + SCOWP *Product Range* + SCOWP *Enterprise Distribution.*

For example, the Supply Chain Performance Outcome for 2010 ($\mathbf{SCPO_{2010}}$) = 112.0 + 58.6 + 5.6 + 16.8 + 6.6 + 4.9 + 4.9 + 2.4 + 8.2 = **220.**

The average of the annual supply chain performance ($\mathbf{SCP_y}$) was used to compute the overall Supply Chain Performance Index (Y) for all firms by finding the average of the supply chain performance outcome of all firms from 2006 to 2010 as in modelled in the study methodology.

From results presented in Table 2 on firm's supply chain performance, the continued increase in total average inventory and related costs were seen with an increase instead of reduction in the unit costs and inventory turnover ratio. This confirms that there are no economies of scale in the firms' supply chains.

The revealed computations were done for each firm to determine their annual supply chain performance index used as the dependent variables (Y) in the next section of correlation analysis and subsequently, on hypotheses tests.

The Correlation between Supply Chain Strategies and Supply Chain Performance

This section presents analysis of correlations between study variables using the Spearman's rank order correlation technique for nominal and ordinal data analyses. Significant variables at the $p<0.01$ level (**) and $p<0.05$ level (*) level of correlation significance were extracted.

Results of the analysis on correlation between SC strategies (Mid-range and long-range) and SC performance are presented in Table 3. There are strong and positive relationships are observed between long-range SC strategies ($r = 0.668$, $p < 0.01$) and SC performance. The four long-range SC strategies are efficient supply chain strategy, cash-to-cash cycle SC strategy, speed to market SC strategy and a risk-hedging supply chain strategy. Indeed, efficiency, financial flow, delivery to respective market segments and minimization of risk are SC network specific. There was equally some relationship between Mid-range SC strategies and SC performance ($r = 0.559$, $p < 0.05$). The only Mid-range SC strategy is the third-party SC strategy. The details about the variables are as shown in Table 3.

Table 3: *Correlation between Supply Chain Strategies and Supply Chain Performance*

Supply Chain Strategy	*Variables*	*Spearman's rho Correlation Coefficients*
Long-range SC Strategy	Efficient SC strategy.	0.529(*)
Mid-range SC Strategy	Third-party SC strategy	0.559(*)
Long-range SC Strategy	Cash-to-cash cycle SC strategy	0.584(*)
Long-range SC Strategy	Speed to market SC strategy	0.668(**)
Long-range SC Strategy	A Risk-hedging SC strategy.	0.562(*)

Source: Research Data, 2014

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

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

Results presented in Table 3 imply that both Mid-range and Long-range SC strategies are highly related to SC performance, especially SC performance.

Hypotheses Testing

Recall, the main objective of the study was designed to establish the relationship between SC strategies and SC performance among large-scale manufacturing firms in Kenya. Literature review and theoretical reasoning led to belief that both Mid-range and Long-range supply chain strategies will be associated with supply chain performance outcomes. The first four supply chain strategies are categorized as Mid-range Supply Chain Strategies; they are operational; and they will affect mid-term firm performance. Supply chain strategies numbers LR4 through LR16 are the most representative of how companies articulate their models for competing now and in future. They are known as Long-range (LR) supply chain strategies. It was anticipated that supply chain strategies would have a strong, positive and significant relationship with firm's supply chain performance outcome(s). Hence, the following hypotheses were tested:

H: *Supply Chain Strategies Are Positively Related To Supply Chain Performance*

The supply chain strategies' items consisted statements that sought to measure the extent to which the firms have used the supply chain strategies and a scale of 1 to 5 where "5"was, to a great extent, and "1,"to a very small extent. Supply chain performance was an index computed from achievement on certain items for five years. The Spearman's correlation showed a significant relationship between long-range ($r = 0.668$, $p < 0.01$) and mid range ($r = 0.559$, $p < 0.05$) supply chain strategies individually with supply chain performance. Further analysis using multiple regression stepwise analysis generated five regression models as presented in Table 4 and general model.

Table 4a: *Regression Results for SC Strategies and Supply Chain Performance*

Model Summary: Objective i (Data Analysis Model #i) Method: Stepwise (Criteria: Probability-of-F-to-enter=.050, Probability-of-F-to-remove = .100).					**ANOVA(f)**		
Stepwise Model	**R**	**R^2**	**Adjusted R^2**	**Std. Error of the Estimate**	**Mean Square**	**F**	**Sig.**
1	.540(a)	.292	.285	33.39872	46899.026	42.044	.000(a)
2	.605(b)	.366	.354	31.74952	29433.089	29.199	.000(b)
3	.677(c)	.459	.443	29.48869	24573.047	28.258	.000(c)
4	.710(d)	.504	.484	28.37055	20248.374	25.157	.000(d)
5	.733(e)	.537	.513	27.54915	17259.958	22.742	.000(e)

Source: Research Data, 2014

a ,b, c, d &e Predictors: (Constant), supply chain strategies

f Dependent Variable: Firm Supply Chain Performance Outcome

From the regression results in Table 4, five models were generated using stepwise approach where the probability-of-F-to-enter was d".050, while the probability-of-F-to-remove was e" .100. The stepwise multiple regression model number 5 is the most significant model since it has inclusion of most supply chain strategies. Results are significant at the set confidence interval of 95 percent.

Also from the model in Table 4, it can be observed that as one moves from stepwise model number one to five, the standard error of the estimate keeps decreasing from 33.39872 to 27.54915 as so do the F values. The adjusted R^2 also keeps on improving from 0.285 to 0.513. Although all models are significant, the stepwise model number five is a good predicator of the relationship between supply chain strategies and firm's supply chain performance outcome.

The stepwise regression model number 5 shows a moderately strong significant relationship between supply chain strategies and firm's supply chain performance outcome, implying that the supply chain strategies explain 51.3 percent of changes in the firm's supply chain performance outcome.

The coefficients of this predicative model aimed at addressing concerns of objective one as modelled in model number seven of data analysis given as in Annex I.

The coefficients of this predicative model aimed at addressing concerns of objective as modelled in model number ten of the data analysis given as in annex I. The predictive model of the relationship between supply chain strategies and supply chain performance, therefore, takes the form of:

Supply Chain Performance = = 8.707 No need for SC strategy + 2.161 Risk-hedging SC strategy -5.609 Nano-Chain SC strategy + 3.660 Speed to market SC strategy + 2.644 Cash-to-cash cycle SC strategy … (R^2 = 0. 513, F = 22.742; Sig. = .000(e))

From specific beta coefficients for measures of supply chain strategies in the presented predictive model, both long range and mid range supply chain strategies make some contribution to the firm's supply chain performance outcome. The long-range supply chain strategies that have a significant (pd"0.05) positive effect (positive beta value) on firm's supply chain performance include: Long-range risk-hedging Supply Chain strategy directed to minimizing risks like production capacity, quality, floods and earthquakes in the process of procurement, production and distribution (Beta = .197); long-range speed to market supply chain strategy that allows the firm and supply chain members to adopt to different products of different segment of the market (Beta = .331); and long-range cash-to-cash cycle supply chain strategy aimed at speeding as well as retaining cash flow for the firm (Beta = .197). The long-range speed to market supply chain strategy has the highest standardized coefficient compared to risk-hedging and cast-to-cash long-range supply chain strategies. Hence, firms need to invest

more on supply chain strategies directed to delivery to their different market segments in order to improve their customer service levels, while minimizing risks inherent in the supply chain so as to enhance the supply chain surplus in form of cash.

The mid-range supply chain strategies that have a significant (pd"0.05) effect (positive beta value) on firm's supply chain performance include: mid-range supply chain strategy where the firm does not have or pursue a formal supply chain strategy with beta =.716; a mid-range nano-Chain supply chain strategy that allows the firm's assets and operations to react to emerging customers trends at each node of the supply chain with beta = -.500. It implies that the most dangerous Mid-range strategies for the firm to pursue are those reactive and not planned for.

As shown in Table 4a and presented predictive model, when the two independent variables (Mid-range and long-range supply chain strategies) are included in the same model, they have a strong positive effect on supply chain performance with a correlation coefficient of R = 0.733(e) and adjusted R^2 = 0. 513, F = 22.742; Sig. = .000(e). This implies that 51.3 percent of variance in the firm's supply chain performance is explained by combined variables of mid-range and long-range supply chain strategies. The relationships between supply chain strategies and supply chain performance outcome are positive.

Given that the calculated F = 22.742, while the $F_{Critical}$ = 1.7611; at α = 5% (95% C.I), numerator degrees of freedom - V_1 = 16 (17-1); and denominator degrees of freedom -V_2 = 87 (103-16). Then, F ≥ F critical at α = 5 percent. This is a clear indication that supply chain strategy is a significant predicator of the firm's supply chain performance outcome and hence, $\mathbf{H}_1$ is accepted.

The main 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's supply chain performance. Hence, the following sub-hypothesis was tested:

H_{1a}: Mid-range SC Strategies Are Positively Related To Supply Chain Performance

Results of Spearman's correlation showed a correlation coefficient of r = 0.559, p< 0.05. The multiple regression analysis is presented in Table 4a and Annex I.

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

					ANOVA(f)		
Model Summary	*R*	R^2	*Adjusted* R^2	*Std. Error of the Estimate*	*Mean Square*	*F*	*Sig.*
Model No. 7a	535(a)	.385	.233	86.36296	10720.357	1.437	.227(a)

Source: Research Data, 2014

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

b Dependent Variable: Firm Supply Chain Performance Outcome

Table 5b: *Regression Coefficient for Mid-range Supply Chain Strategies and Supply Chain Performance*

Mid-range Supply chain a strategies	No need for supply chain strategy	Third-party SC strategy	Tie down the firm supply chain strategy	Nano-Chain supply chain strategy
Standardized Coefficients (Beta)	.598	.289	.036	-.356

Source: Research Data, 2014

Beta values for the four Mid-range supply chain strategies showed greater individual contributions. From the summary of standardized beta coefficients in Annex I, the three Mid-range supply chain strategies that have a positive effect (positive beta value) on the firm's supply chain performance outcome

include: Mid-range supply chain strategies where the firm does not have or pursue a formal supply chain strategy (No need for supply chain strategy); 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 numerous internal a well as external activities are co-ordinated to conform to the overall business strategy (Tie down the firm supply chain strategy). The most risky Mid-range supply chain strategies are those allow the firm's assets and operations to react to emerging customers' trends at each node of the supply chain (Nano-Chain supply chain strategy).

Analysis presented in Table 5a and Annex I showed that the Mid-range supply chain strategies have a strong positive effect on firm'd supply chain performance with a correlation coefficient of R = .535(a) and adjusted $R^2 = 0.233$. This implies that 23 percent of variance in firm's supply chain performance is partly explained by the Mid-range supply chain strategies. Given that á = 5 percent, the F value of 1.437 is not significant (sign. = .227) and hence, Mid-range supply chain strategies are not good predicators of the firm's supply chain performance. Thus, $\mathbf{H}_{1a}$ is rejected.

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

H_{1b}: *Long-Range SC Strategies Are Positively Related To Supply Chain Performance*

On the anticipated relationship between long-range supply chain strategies and firm's supply chain performance, results of Spearman's correlation showed a correlation coefficient of $r = 0.668$, $p < 0.01$. The multiple regression analysis is presented in Table 6.

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

R	Adjusted R^2	Std. Error of the Estimate	F	Sig.
.704(a)	.495	39.49696	1.762	.0455(a)

Source: Research Data, 2014
a Predictors: (Constant), Long-Range Supply chain a strategies
b Dependent Variable: Firm Supply Chain Performance Outcome

Based on beta values for twelve long-range supply chain strategies that showed greater individual contributions to the firm's supply chain performance, strategies that have a positive effect (positive beta value) on firm's supply chain 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 = .484); long-range supply chain strategies aimed at speeding as well as retaining cash flow for the firm (Cash-to-cash cycle supply chain strategy, Beta =.323); long-range supply chain strategies, which are reactive to procurement, production and distribution in dynamic environments to answer to customer needs (Micro-chain supply chain strategy, Beta =.200); long-range supply chain strategies responsive including flexible to customer needs to enable the firm Feed Customers in ways that are efficient for them (Demand supply chain strategy, Beta =.189); long-range supply chain strategies directed to minimize risks like production capacity, quality, floods as well as earthquakes in the process of procurement, production and distribution (Risk-hedging Supply Chain strategy, Beta =.140); and 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 =.064).

Some of the long-range supply chain strategies that embody a negative impact on the firm's supply chain performance (negative beta value) and

hence, risky to pursue include: long-range supply chain strategies where the firm creates an additional relationship with supply chain members at the point where their operations interact (Synergistic SC strategy, Beta = -.014); long-range supply chain strategies focused on variable productivity to meet speculative purchasing as well as sales promotion (Innovation supply chain strategy, Beta = -.092); long-range supply chain strategies that increase the firm's ability to mass-maximize and build close relations with customers when designing new including modifying existing products (Market dominance and backlog supply chain strategy, Beta = -.110); long-range supply chain strategies that provide balance of flexibility and cost efficiency in the supply chain while meeting marketplace requirements (Value chain strategy, Beta = -.326); and long-range supply chain strategies that allow the firm to cost-effectively receive and deliver products as sources of supply and customer change (Project logistics supply chain strategy, Beta = -.332)

The analysis presented in Table 6 revealed that long-range supply chain strategies have a strong positive effect on firm's supply chain performance with a correlation coefficient of R = 0.704 (a) and $R^2 = 0.495$. This implies that 49.5 percent of variance in firm's supply chain performance is partly explained by long-range supply chain strategies.

Given that the calculated F = 1.762, while the $F_{Critical} = 1.755$; at á = 5% (95% C.I), numerator degrees of freedom - $V_1 = 16$ (17-1) and denominator degrees of freedom - $V_2 = 91$ (103-12), then, F e" F critical at á = 5 percent. This implies that relationships between long-range supply chain strategies and supply chain performance are positive and statistically significant at á = 5 percent and hence, $\mathbf{H}_{1b}$ is accepted.

Summary of Findings

Stepwise multi-regression analysis was done to ensure accuracy of predictive relationships given that several indicators were used to measure the study variables. The sub-hypotheses were also tested. Based on the main objective of the study, the following major and sub-hypotheses were derived and tested. The results of hypotheses tests are summarized in Table 7.

Table 7: *Summary and Results of Hypotheses Testing*

Primary Objective	*Hypothesis /Description*	*Results*	*Interpretation & Remark*
To explore the relationship between SC strategies and SC performance of large-scale manufacturing firms in Kenya	**H**: Supply chain strategies are positively related to supply chain performance	R = 0.733; Adjusted R^2 = 0.513; F = 22.742, while the $F_{Critical}$ = 1.7611; Then F = $F_{critical}$ at α = 5%. There is a moderately strong significant relationship between SC strategies and firm SC performance, implying that the supply chain strategies explain 51.3% of the changes in the firm's SC performance outcome.	These results indicate that supply chain strategy is a significant predicator of the firm's supply chain performance The results confirm hypothesis H.
	$\mathbf{H_a}$:Mid-range SC strategies are positively related to supply chain performance	r = 0.559, p< 0.05; R = .621(a) and R^2 = 0.385, F = 1.437; α = 0.227 is greater than 0.05 (α = 5%). There is no significant relationship between mid-range SC strategies and firm's SC performance.	These results indicate that mid-range supply chain strategies are not good predicators of the firm's supply chain performance The results do not confirm hypothesis Ha
	$\mathbf{H_b}$:Long-range SC strategies are positively related to supply chain performance outcome	r = 0.690, p< 0.01; R = 0.704 (a) and R^2 = 0.50, F = 1.762; α = 0.0455 is less than α =0.05 There is a significant positive relationship between long-range SC strategies and SC performance.	This implies that relationships between long-range supply chain strategies and supply chain performance are positive and statistically significant The results confirm hypothesis $\mathbf{H_b}$

Source: Research Data, 2014

Discussion of Findings

Scholarly research should contribute and extend the current literature by filling in existing gaps for both researchers and managers (Varadarajan, 2003; Kirchoff, 2007). This section presents discussion of findings guided by the main objective of the study and tesetd hypotheses.

The main objective of the study was to explore the relationship between SC strategies and SC performance of large-scale manufacturing firms in Kenya. The study focused on supply chain outcome measures only, which included: sales volumes, total average inventory, reduction in unit costs, inventory cost, inventory turnover ratio, inventory flow rate, order lead time, range of products and effectiveness of enterprise distribution. Use of a wide range of measures in a balanced and weighted manner lends to some support of findings. According to Turner, Bititici and Nudurupati (2005), there was limited literature that addresses issues of SCM implementation in a balanced way although implementations of performance measures in companies are now wide spread.

It was hypothesized that supply chain strategies are positively related to supply chain performance outcome and findings presented in Table 6.1 confirm the hypothesis. Both mid-range and long-range supply chain strategies in a single model as predicted are positively and significantly related to supply chain performance. This captures and unravels the methodological weaknesses noted by Awino (2011) that discussions of quantitative and balanced SC performance measures are noticeably excluded in most studies.

This empirical evidence follows conclusions from other studies, which found out that selection and implementation of the right supply chain strategy facilitates performance of the supply chain (Fisher, 1997). In due regard, it can lead to improvements of firm's SCM operational metrics such as inventory turnover, order fulfilment and stock availability (Turner, Bititici and Nudurupati, 2005).

In comparison to results provided by Vickery and colleagues (1999) on furniture industry, results from this study suggest that large scale manufacturing firms are more advanced in their supply chain activities because they have implemented a number of mid-range and long-range supply chain strategies thereby exhibiting a stronger positive relationship between supply chain strategies and supply chain performance outcomes. This study contributes to literature of supply chain strategy by analysing the relationship of sixteen supply chain strategies with supply chain performance compared to other studies (Lee, 2004) and by testing at the same time, factors that motivate firms to invest in management of their supply chain functions.

The strategic planning process in firms can be short-term, mid-range or long-range. Long range strategies are more competitive than operational mid-term and short-range strategies. Large scale manufacturing firms have invested more on long-range supply chain strategies, which had seen improvement in their supply chain performance. Mid-range supply chain strategies explained only 38 percent of changes in supply chain performance but they were not significant predictors of the firm's supply chain performance. Long-range strategies explained 50 percent of such changes in the firm's supply chain performance. This corresponds to Thatte's (2007) findings that long-range planning for the end customer in the marketplace today determined by the success or failure of supply chains management practices aimed at not only improved competitive success but also the key to survival.

The supply chain strategies with the highest impact on the firm's supply chain performance are the long-range speed to market supply chain strategies, risk-hedging and cast-to-cash long-range supply chain strategies. Hence, firms need to invest more on supply chain strategies directed to delivery to their different market segments in order to improve their customer service levels while minimizing risks inherent in the supply chain so as to

enhance the supply chain surplus in form of cash. The most risky mid-range supply chain strategies are nano-chain supply chain strategies that allow the firm's assets and operations to react to emerging customers' trends at each node of the supply chain.

Mid-range supply chain strategies explained less than 38 percent of outcomes in supply chain performance, although the overall contribution of both long-range and mid-range supply chain strategies explained 51.3 percent of the firm's supply chain performance. From these findings, the study can conclusively attribute the positive relationship between supply chain strategies and supply chain performance to long-range supply chain strategies.

Supply chain strategy is a significant predicator of the firm's SC performance since there is a strong and significant relationship between SC strategy and the firm's SC performance.

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 significant use of supply chain strategies that will lead to different achievement levels in firm's performance.

This study has justified and shown how to measure the impact of investing in supply chain strategy and technology within the firm. This has provided answers to Bhagwat and Sharma's (2007) proposition that a company may invest resources significantly in supply chains and partnerships in order to improve day-to-day business operations but find it hard to determine whether or not its strategy has been effective.

This study also made methodological contributions that will help to advance supply chain management and operations research in future. By

combining multiple methods with data collected through a questionnaire survey in multiple sub-sectors and across private as well as public large scale manufacturing firms, this study overcomes Boyer and Swink's (2008) frequent criticism of common method bias. Furthermore, the study is built on the supply chain strategies, technology and firm's performance based on the operations strategy literature, which, according to Boyer and Pagell (2000), can lead to highly reliable and valid constructs.

References

Alain H., and Martin B., (2009),"Mastery of operational competencies in the context of supply chain management." Supply Chain Management: *An International Journal*, Vol. 14 Iss : 1 pp. 49 – 63

Aosa E. (1992). *An Empirical Investigation of Aspects of Strategy Formulation and Implementation within Large Private Manufacturing Companies in Kenya* –Unpublished PhD thesis, University of Strathclyde Glasgow Scotland, U.K.

Awino Z. B (2011). "Strategic Management: An Empirical Investigation of Selected Strategy Variables on Firms Performance: A Study of Supply Chain Management in Large Private Manufacturing Firms In Kenya." *Prime Journals. Business Administration and Management (BAM)* Vol. 1(1), pp. 09-18.

Beamon B.M, (1999) Measuring Supply Chain Performance, *International Journal of Operations & Production Management*, Vol. 19 No. 3, pp. 275-292, # MCB University Press, 0144-3577Ohio, USA.

Bhagwat R. and Sharma, M.K (2007). Performance measurement of supply chain management: A balanced scorecard approach/ Computers & Industrial Engineering 53 (2007) 43–62.

Chase R.B, Jacobs R.F Aquilano N.J and Agarwal N.K (2009) Operations Management for Competitive Advantage 11th edition, Tata McGraw - Hill, New Delhi.

Chen, I.J. and Paulraj, A. (2004), "Towards a theory of supply chain management: the constructs and measurements", *Journal of Operations Management*, Vol. 22 No. 2, pp. 119-51.

Ezirim, A.C. and 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.

Fisher, L. M. (1997). What is the right supply chain for your product? Harvard Business Review, 105–116.

Gadde, L.E., and Håkansson H., 2001. Supply Network Strategies. West Sussex, UK: John Wiley & Sons, pp. 74-7.

Gattorna, J. (2007) Living Supply Chains: *How to mobilize the enterprise around delivery what your customers want*: Prentice Hall. ISBN: 0-273-70614-4.

Gattorna, J.L. (1998), Strategic Supply Chain Management: Best Practices in Supply Chain Management, Gower Publishing, Aldershot. New York, NY, pp. 189-203.

Gibson, A., Mollenkopf, D. and Ozanne, L. (2000), "The integration of marketing and logistics functions: an empirical examination of New Zealand firms", *Journal of Business Logistics, Vol. 21 No. 2,* pp. 89-112.

GoK (2007). Kenya Vision 2030: A Globally Competitive and Prosperous Kenya. Government of Kenya, National Economic and Social Council (NESC), Government Press. Nairobi – Kenya.

Grimm, C. M. (2004), The Practice of Supply Chain Management: Where Theory and Application Converge. Kluwer Academic Publishers, 101 Philip Drive, Assinippi Park, Norwell, Massachusetts 02061. Pp. 356. ISBN 1-4020-7441-7.

Gunasekaran A., Patel C., Ronald E. McGaughey, (2004). A framework for supply chain performance measurement. *International journal of Production Economics* 87 pp. 333–347.

Happek, S. 2005. Supply Chain Strategy: The Importance of Aligning Your Strategies. A United Parcel Services (UPS) of America White Paper, Inc.Atlanta. WPSC.C.S.638.

Hines, T. (2004). Supply chain strategies: Customer driven and customer focused. Oxford: Elsevier.

Jacobs R.F, Chase R.B and Aquilano N.J (2009) Operations and Supply Management McGraw Hill Boston.

Jamie D. C., William J. W., Pedro M. R., Marisabel R., (2010),"Knowledge

management, supply chain technologies, and firm performance", *Management Research Review*, Vol. 33 Iss: 10 pp. 947 – 960.

KAM (2011), Kenya Association of Manufacturers (2010/2011). Edition Directory.

Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard: measures that drive performance", *Harvard Business Review*, Vol. 70 No. 1, pp. 71-9.

Kate C. (2006). Statistical Methods and Computing: Sample size for confidence intervals with known t Intervals. 374 SH, ISBN. 335-0727. UIOWA.

Keegan, D.P., Eiler, R.G. and Jones, C.R. (1991), "Are your performance measures obsolete?" *Management Accounting*, June, pp. 134-47.

Kevin B., Prakash J. S., and Rana K. (2006), "Supply chain management: a structured literature review and implications for future research", *International Journal of Operations & Production Management*, Vol. 26 No. 7, pp. 703-729.

Kidombo H. J., (2007): "Human Resource Strategic Orientation, Organizational Commitment and Firm Performance in Large Private Manufacturing Firms in Kenya" PhD diss., University of Nairobi, SoB, Nairobi – Kenya

Kirchoff, J. F., (2011) "A Resource-Based Perspective on Green Supply Chain Management and Firm Performance" PhD diss., University of Tennessee, http://trace.tennessee.edu/utk_graddiss/1046

Lee, H.L. (2002), "Aligning supply chain strategies with product uncertainties", *California Management Review*, Vol. 44 No. 3, pp. 105-20.

Mentzer, J.T. (2001): Defining Supply Chain Management, in: *Journal of Business Logistics*, Vol. 22, No. 2, pp. 1–25.

Mugenda, O. M and Mugenda, A.G. (2003). Research methods: Qualitative and qualitative approaches. African Centre for Technology Studies, Nairobi, Kenya.

Okoth J. (2012). Are multinationals leaving Kenya? The Financial Post: Bruce House, Standard Street. Nairobi, Kenya. Website: http:// www.financialpost.co.ke Friday, February 17, 2012 10:12:32 AM.

Poluha R. G (2007). Application of the SCOR Model in Supply Chain Management. Youngstown, New York 2007, ISBN 1934043230.

PwCIL, (2010). Industrial Manufacturing: A brief overview of the industrial manufacturing sector in Kenya. *Financial Focus Report* No. 3 2009

Russell, D.M. and Hoag, M.A. (2004), "People and information technology in the supply chain social and organizational influences on adoption", International Journal of Physical Distribution & Logistics Management, Vol. 34 No. 2, pp. 102-22.

Sekaran, U.(2000). *Research Methods for Business: a Skill Building Approach*, Third Edition, New York, John Wiley & Sons.

Stanley E. F., Jeffrey A.O., Gregory M. M. and Bixby M.C (2006), Organizational commitment and governance for supply chain success. *International Journal of Physical Distribution & Logistics Management*, Vol. 36 No. 1, pp. 22-35

Stanley, E. G. & Gregory, M.M., (2001) "Achieving World Class Supply Chain Alignment: Benefits, Barriers and Bridges." A Compiled Research Report.

Stevens, G.C. (1989), "Integrating the supply chain", *International Journal of Production Distribution and Materials Management*, Vol. 19 No. 8, p. 38.

Stiles, P. (2003), "The impact of board on strategy: an empirical examination", *Journal of Management Studies*, Vol. 38, pp. 627-50.

Tomaskovic-Devey, Donald, Jeffrey L. and Shealy T., (1994), "Organizational Survey nonresponse," *Administrative Science Quarterly,* Vol. 39, No. 3, pp. 439-457.

Turner, T. J., Bititici, U. S., & Nudurupati, S. S. (2005). Implementation and impact of performance measures in two SMEs in Central Scotland. Production Planning and Control, 16(2), 135–151.

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.

Weinzimmer, L. G., Nystrom, P. C., & Freeman, S. J. (1998).Measuring organizational growth: Issues, consequences and guidelines. *Journal of Management*, *24*(2), 235/262.

Wilson, E.J. & Lilien, G.L. (1992). Using single informants to study group choice: An examination of research practice in organizational buying. *Kluwer Academic Publishers*, Manufactured in the Netherlands. *Marketing Review*, *15*(5), 333-356.

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

Model	Indicators: Objective i (Data Analysis Model #i) Method: Stepwise (Criteria: Probability-of-F-to-enter=.050, Probability-of-F-to-remove = .100).	Unstand-ardized Coefficients		Stand-ardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Model # 1						
	(Constant)	-.254	10.085		-.025	.980
A supply chain strategy where the firm does not have or pursue a formal SC strategy: MR No need for SC strategy	18.697	2.884	.540	6.484	.000	
Model # 2	(Constant)	-64.511	20.969		-3.076	.003
A SC strategy where the firm does not have or pursue a formal supply chain strategy: MR No need for SC strategy	16.248	2.832	.469	5.738	.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	16.949	4.919	.282	3.446	.001	
Model # 3	(Constant)	-52.603	19.688		-2.672	.009
A supply chain strategy where the firm does not have or pursue a formal SC strategy: MR No need for SC strategy	21.152	2.885	.611	7.331	.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	24.017	4.878	.400	4.923	.000	
A strategy that allows the firm's assets and operations to react to emerging customers trends at each node of the SC: MR Nano-Chain SC strategy	-15.468	3.743	-.367	-4.133	.000	
Model # 4	(Constant)	-49.239	18.974		-2.595	.011
A supply chain strategy where the firm does not have or pursue a formal SC strategy: MR No need for SC strategy	22.852	2.833	.660	8.066	.000	
A supply chain 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	16.060	5.388	.267	2.981	.004	

Model	Indicators: Objective i (Data Analysis Model #i) Method: Stepwise (Criteria: Probability-of-F-to-enter=.050, Probability-of-F-to-remove = .100).	Unstand-ardized Coefficients		Stand-ardized Coefficients	t	Sig.
		B	Std. Error	Beta		
A strategy that allows the firm's assets and operations to react to emerging customers trends at each node of the SC: MR Nano-Chain SC strategy	-18.866	3.774	-.448	-4.999	.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.	9.924	3.301	.271	3.006	.003	
Model # 5	(Constant)	-125.362	34.180		-3.668	.000
A SC strategy where the firm does not have or pursue a formal supply chain strategy. MR No need for SC strategy	24.784	2.846	.716	8.707	.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	11.823	5.472	.197	2.161	.033	
A strategy that allows the firm's assets and operations to react to emerging customers trends at each node of the SC: MR Nano-Chain SC strategy	-21.092	3.760	-.500	-5.609	.000	
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.	12.119	3.311	.331	3.660	.000	
A SC strategy aimed at speeding and retaining cash flow for the firm: LR Cash-to-cash cycle SC strategy	18.421	6.967	.197	2.644	.010	

Source: Research Data, 2014

a Dependent Variable: Firm Supply Chain Performance Outcome