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Research Paper

Primary Supply Chain Processes Outsourcing and Supply Chain Performance for Manufacturing Firms in Nairobi's Industrial Area

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ABSTRACT:- *This study sought to examine the effect of primary supply chain processes outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area. This study adopted a descriptive research design. The population for this study was all the manufacturing firms in Kenya. The target population for this study was all the manufacturing firms operating in Nairobi's Industrial Area. The sampling frame for this study was all the manufacturing firms operating in Nairobi's industrial area. Simple random sampling was adopted for this study in selecting the respondents. The sample captured 30% of members of the sampling frame to comprise the sample. This research utilized primary data collected through a structured questionnaire. The study primarily adopted a descriptive data analysis and inferential data analysis. The research found out that primary supply chain processes outsourcing improves supply chain performance for manufacturing in Nairobi's industrial area. In line with the findings of the study, the following recommendations are made: Firms seeking supply chain performance in their manufacturing activities should outsource their primary functions to independent third parties. This primary functions are inclusive of manufacturing activities, inbound logistics and outbound logistics.*

Keywords:- *Primary Supply Chain Processes, Outsourcing, Supply Chain Performance*

I. INTRODUCTION

Outsourcing has become the most favored avenue for cost cutting with the idea being to outsource non core business functions leaving the company to concentrate on its core objectives (Gicheni, 2009). Forty four percent of firms globally have integrated supply chain processes outsourcing into their operations (Eurostat, 2012). Within just 5 years, 70 percent of all infrastructures will be outsourced. This is a dramatic shift (Century Link, 2014). Supply Chain Performance crosses company boundaries since it includes basic materials, components, subassemblies and finished products, and distribution through various channels to the end customer. It also crosses traditional functional organization lines such as procurement, manufacturing, distribution, marketing & sales, and research & development. Manufacturing takes turns under all types of economic systems. In a free market economy, manufacturing is usually directed toward the mass production of products for sale to consumers at a profit (Friedman, 2006). The manufacturing sector is a major contributor of Kenya's GDP as indicated by KIPPRA (2013). KIPPRA's report on economic growth states that the manufacturing sector in Kenya constitutes 70 per cent of the industrial sector contribution to GDP.

Problem Statement

Mohiuddin and Su (2013) state that manufacturing firms, and indeed all firms, aim at improving supply chain performance. In the pursuit of improved supply chain performance manufacturing firms are turning towards outsourcing. However, there are a limited number of rigorous studies looking at the effect of primary supply chain processes outsourcing on the supply chain performance of manufacturing firms. Therefore this study sought to examine the effect of primary supply chain processes outsourcing on supply chain performance for manufacturing firms in Nairobi's industrial area.

General Objective

To examine the effect of primary supply chain processes outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area.

Specific Objectives

(i) To determine the effect of product development outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area

(ii) To establish the effect of manufacturing outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area.

(iii) To examine the effect of outbound logistics outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area

(iv) To determine the effect of inbound logistics outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area

Justification of the study

This research will benefit scholars in that it will add to the growing body of research in to the field of outsourcing. In addition it will provide both theoretical and empirical literature in to the aforementioned field. This study will be of importance to firms globally who do not outsource their supply chain processes in helping them determine whether to incorporate supply chain processes outsourcing in their operations in pursuit of improved supply chain performance. The study will be of benefit to outsourcing service providers/agents, this is because it will help them understand the impact of their services on the supply chain performance of their clients.

Limitation of the Study

The study will be limited to the four objectives that have been specified earlier in the chapter. Overall the study will be limited to the general objective where the researcher intends to determine the effect of primary processes outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area. The study will be limited to the four objectives that have been specified earlier. The study will be limited to the variables of product development, manufacturing, inbound logistics and outbound logistics.

Scope of the Study

The study utilized primary data. The primary data was collected through a questionnaire administered to supply chain managers or their equivalents in manufacturing firms located in Industrial area. This research covered a period of eighteen months.

II. LITERATURE REVIEW

Theoretical Review

Kleijn and Rorink (2012) states that, primary processes are end-to-end, cross-functional and deliver value to customers. Primary processes are often called critical processes, as they represent the essential activities that an organization performs to accomplish its mission. According to Porter (1985), the primary activities are: Inbound Logistics - involve relationships with suppliers and include all the activities required to receive, store, and disseminate inputs; Operations - are all the activities required to transform inputs into outputs (products and services); Outbound Logistics - include all the activities required to collect, store, and distribute the output; Marketing and Sales - activities inform buyers about products and services, induce buyers to purchase them, and facilitate their purchase; Service - includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

The BSC model is a framework or structure created for integrating indicators derived from the strategy that continues to retain financial indicators of the past actions, completed with inductors of future financial actions. The inductors which include the customers, the processes and the perspectives of learning and growth, are derived from an explicit and rigorous translation of the strategy of the organization into tangible objectives and indicators. The original model is composed by four perspectives, namely: Financial perspective, customer perspective, internal processes perspective, and learning and growth perspective. The BSC can be for the measurement of SC performance by splitting the measures of timely delivery, product quality, flexibility, costs, productivity, reliability among other measures within the four perspectives of the BSC (Barber, 2008).

Empirical Literature Review

Mohiuddin and Su (2013) conducted a study titled Manufacturing Small and Medium Size Enterprise's Offshore Outsourcing and competitive advantage: An Exploratory Study On Canadian Off shoring Manufacturing smes. The main objective of this research was to get an in-depth understanding on influences and effects of smes offshoring to these firms in terms of supply chain performances and whether the offshoring is a growth strategy for offshoring manufacturing SMEs, in addition to the efficiency related advantages. The adopted a qualitative multiple case study approach for the study. They found out that offshore outsourcing has contributed significantly to overall competitiveness for 10 out of 13 firms.

Kilasi, Juma, &Mathooko (2013) conducted a study on the impact of Outsourcing of Logistics on the Supply chain performance strategy of East African Breweries Limited. The study sought to determine the impact of the outsourcing of logistics on the supply chain performance strategy of East African Breweries limited. . The study found that the outsourcing of Import and inbound has an impact on EABL's supply chain performance strategy. The study also concludes that the outsourcing of Import and inbound affects the supply chain performance of EABL to a great extent.

III. RESEARCH METHODOLOGY

Yin (2009) states that a research design is the blue print of the study. Research design refers to the logical structure of the inquiry. This study adopted a descriptive research design. Descriptive research as are oriented toward the determination of the status of a given phenomenon rather than toward the isolation of causative factors accounting for its existence (Singh, 2006). The population for this study was all the manufacturing firms in Kenya. The target population for this study was all the manufacturing firms operating in Nairobi's Industrial Area. This target population was chosen for the study since due to the fact that Nairobi's industrial Area has the highest concentration of manufacturing firms in kenya (KNBS, 2013). The sampling frame for this study was all the manufacturing firms operating in Nairobi's industrial area. Simple random sampling was adopted for this study in selecting the respondents. The sample captured 30% of members of the sampling frame to comprise the sample as advocated by Gall, Gall and Borg (2003). KNBS (2013) indicates that there are 358 manufacturing firms in this area. This is the highest concentration in any geographical zoning in Kenya. The sample for the study was obtained as shown in Table 1.

Table 3. 1: Sample Size

Target Population	Sample Size	Percentage
358	108	30%

This research utilized primary data collected through a structured questionnaire. In relation to the data collection procedure the study developed a timetable for data collection and scheduled appointments with the respondents, specifying in detail the date, time and place where the data was to be collected. The unit of analysis in this study is the manufacturing firm. Since the study is majorly based on supply chain processes outsourcing effect on supply chain performance, the target respondents were the officers in charge of supply chain management or its equivalent. The study primarily adopted a descriptive data analysis and inferential data analysis. The study used SPSS version 20 and MS Excel to facilitate the analysis of data.

IV. FINDINGS AND DISCUSSIONS

Out of the administered 108 questionnaires, 104 were returned fully completed while 4 were retuned either incomplete or spoilt in a manner that rendered them incomprehensible and incapable of analysis. The incomplete questionnaires were discarded from the analysis process while the completed questionnaires were taken for analysis. These 104 questionnaires represented a response rate of 96% and a non response rate of 4%. This response was deemed adequate for further analysis.

With regards to the four processes that comprise primary processes which include product development, manufacturing outbound logistics and inbound logistics, the respondents were required to provide numerical responses (in appropriate units) for each year over a period of five years on the total volume of each activity and numerical responses on the volume of each activity that was undertaken by contracted external third parties on behalf of the firm that is outsourced. From these five year responses a simple arithmetic mean was calculated to determine the average volume of the total of each activity and its corresponding outsourced volume. The latter was expressed as a percentage of the former to determine the level to which the activity in question was outsourced. The computed percentages were then categorized into five categories as follows: 0%-20%, 21%-40%, 41%-60%, 61%-80% and 81%-100%. For more effective and efficient analysis each of the categories was assigned a score of 1,2,3,4 and 5 respectively.

With respect to supply chain performance metrics the study focused on timeliness, productivity, costs and quality. The respondents were expected to indicate the productivity measures for various supply chain activities over a period of five years and the industry average or firm benchmark for the same activities. These year specific averages and benchmarks were used to calculate overall averages over the five year period. These five year averages of the industry/firm benchmark were expressed as percentages of the five year average of the supply chain activities times and classified into two categories, that is 0%-50% and 51%-100% . For ease of analysis the computed percentages were captured in a two point scale (2=51%-100% and 1= 0%-50%) and the general level of acceptance was determined by calculating the means and standard deviation for the various statements as per the responses.

Chi Square Test

In an effort to ascertain the significance of the association between the independent variables primary processes and the dependent variable supply chain performance, a chi-square test was conducted. Figure below indicates that, 81 organizations indicated that they outsourced their primary functions thus gaining improved supply chain performance of less than 50%. It was observed that twenty three (23) organizations that outsourcing their primary processes gained improved supply chain performance of greater than 50%. This is indicative that primary process outsourcing has a relationship with improved supply chain performance as 7 companies that outsourced more than 80% of their secondary functions got greater than 50% improvement in supply chain performance. These findings are shown in Table 2.

Table 2. Cross tabulation of Primary Processes and Supply chain performance

Primary Processes * Supply chain performance Cross tabulation					
			Supply chain	**performance**	**Total**
			1% - 50%	51% - 100%	
Primary Processes	0%-20%	Count	16	7	**23**
		Expected Count	17	5	**23**
	21%-40%	Count	9	3	**12**
		Expected Count	9	2	**12**
	41%-60%	Count	32	3	**35**
		Expected Count	27	7	**35**
	61%-80%	Count	19	6	**25**
		Expected Count	19	5	**25**
	81%-100%	Count	5	4	**9**
		Expected Count	1	7	**9**
Total		Count	81	23	**104**
		Expected Count	**81**	**23**	**104**

Table 3 indicates that the calculated value of the Chi-Square statistic was 7.33 at 4 degrees of freedom. Because the significance level (0.0077) which is less than the threshold of 0.05, it can be clearly observed that there is a significant association between secondary.

Table 3. Chi square test of Primary Processes * Supply chain performance

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2sided)
Pearson Chi-Square	7.366358	4	0.0077488
Likelihood Ratio	7.741716	4	0.0015110
Linear-by-Linear Association	0.003555	1	0.0024537
N of Valid Cases	104		
A	2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.99.		

The symmetric measure confirms that the association is strong and statistically significant (C=0.857 Sig =0.007 as shown in Table 4.

Table 4. Symmetric Measures for Primary Processes and Supply chain performance

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.857	0.0077
N of Valid Cases		104	
A	Not assuming the null hypothesis.		
B	Using the asymptotic standard error assuming the null hypothesis.		

V. CORRELATION

A simple Pearson's correlation was used to confirm the results of the regression analysis, according. The main result of a correlation is called the correlation coefficient (or "r"). It ranges from -1.0 to +1.0. The closer r is to +1 or -1, the more closely the two variables are related. If r is close to 0, it means there is no relationship between the variables. If r is positive, it means that as one variable gets large the other gets larger. If r is negative it means that as one gets larger, the other gets smaller (often called an "inverse" correlation). All the tested variables were significant as all of them had a p value of 0.000. From the correlation analysis, it can be noted that primary processes outsourcing has a positive correlation with supply chain performance as the r value was 0.556 this shows that whenever the primary process outsourcing increase by 1, the supply chain performance improves by 0.556 as shown in Table 5.

Table 5. Correlation Between Primary Process Outsourcing and Supply Chain Performance

Correlations			
		Primary processes	Supply chain Performance
Primary processes	Pearson Correlation	1.000	0.556
	Sig. (2-tailed)		0.002
	N	104.000	95.000
Supply chain performance	Pearson Correlation	0.556	1.000
	Sig. (2-tailed)	0.002	
	N	95.000	95.000
*	Correlation is significant at the 0.05 level (2-tailed).		

Regression analysis between primary process outsourcing and supply chain performance

The general objective tried to establish whether primary process outsourcing had a significant effect on supply chain performance. This objective was tested by regressing primary processes outsourcing and supply chain performance guided by the equation $Y= \beta_0+\beta_1 X$ where X represented primary process outsourcing and Y denoted supply chain performance. The results of the regression are presented in table below. Table 6 displays R (the correlation between the observed and predicted values of the dependent variable), which is .559. This is an average relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .455. This means that 45 % of the variation supply chain performance (dependent variable) can be explained from outsourcing primary processes. The value of the standard error (sy/x) is shown in the output as .41 The regression was a fair fit describing 45.5% of the variance in primary process outsourcing R^2adj=43.4% this indicates only a slight overestimate with the model

Table 6. Summary for Primary Process Outsourcing and Supply Chain Performance

Model Summary					
Model	R	R Square	Adjusted R Square	**Std. Error of the Estimate**	
1	0.55974	0.45523	0.43475	0.413994	
A	**Predictors: (Constant), Primary processes**				

Table 7 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for

values, the mean square (the sum of squares divided by the degrees of freedom), is 1.11, the F statistic (the regression mean square (MSR) divided by the residual mean square [MSE]) is 6.52 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 15.96, df as 93 and a mean square of 0.171. The overall relationship was statistically significant ($F_{1,94}$=6.520, p<0.05) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Table 7. ANOVA for Primary Process Outsourcing and Supply Chain Performance

ANOVA(b)						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.117625	1	1.117625	6.520894	0.002288
	Residual	15.9394	93	0.171391		
	Total	17.05703	94			
A	Predictors: (Constant), Primary processes					
B	Dependent Variable: Supply chain performance					

Table 8 represents coefficients of all the independent variables and the dependent variable. It can be noticed from the significance column that the predictor is significant at 0.0076 this is less than 0.05. It can be observed that every time primary process outsourcing is increased by 1 unit, supply chain performance is improved by 0.2 units, when all other variables are held constant.

Table 8. Coefficients for Primary Process Outsourcing and Supply Chain Performance

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.279939	0.278864		11.7618	0.0076
	Primary processes	0.2421	0.094808	0.25597	-2.5536	0.0022
A	**Dependent Variable: Supply chain performance**					

These findings indicate that the outsourcing of primary supply chain processes leads to the improvement of supply chain performance. These findings correspond to those of Mubarik, Warsi, Nayaz and Malik (2012) who found out that primary processes outsourcing by the outlined industry do not only improve SCM performance but also provides a significant influence on supply chain effectiveness and efficiency for Pharmaceutical sector of Pakistan. Cost reduction is the main factor due to which companies outsource. They also found that focus on core competency is main benefit for the companies in outsourcing their carrier selection activities. These findings contradict those of Benit (2008) who found out that outsourcing has no significant impact on the supply chain performance of a firm. It was to be noted that while a positive relationship did exist, it was not nearly significant. Market freedom factors and forming outsourcing are significant variables of the supply chain performance of multinational corporations. Therefore this study concludes that outsourcing of forming does lead to the improvement of supply chain performance for manufacturing firms. Therefore this study concludes that the outsourcing of primary supply chain processes results in improvement in supply chain performance.

V. SUMMARY OF FINDINGS AND CONCLUSIONS

The research found out that primary supply chain processes outsourcing improves supply chain performance for manufacturing in Nairobi's industrial area. The research found that overall the outsourcing of both categories of logistics, that is: inbound and outbound logistics had more effect on the improvement of supply chain performance as compared to the outsourcing of manufacturing which was also found to be less prevalent compared to the outsourcing of both inbound and outbound logistics. It was found that most firms prefer to undertake their manufacturing activities in house, while outbound and inbound logistics activities were very likely supply chain processes for outsourcing due to the avoidance of initial costs and lack of expertise within the firm.

RECOMMENDATIONS

In line with the findings of the study, the following recommendations are made: Firms seeking supply chain performance in their manufacturing activities should outsource their primary functions to independent third parties. This primary functions are inclusive of manufacturing activities, inbound logistics and outbound logistics. This is attributed to the fact that primary supply chain process outsourcing has the greatest potential of generating a supply chain performance for the firm. In the outsourcing of primary processes manufacturing related activities should be the minimally outsourced; however inbound logistics and outbound logistics should be the most outsourced primary supply chain activities.

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