



Secondary 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 secondary 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. 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 that secondary supply chain processes outsourcing leads to the creation of supply chain performance. In line with these findings the study recommends that in an attempt to create a supply chain performance for manufacturing firms, they should outsource their secondary supply chain activities.

Keywords:- Secondary Supply chain Processes, Outsourcing, Supply Chain Performance.

I. INTRODUCTION

According to Overby (2007) outsourcing is often viewed as involving the contracting out of a business function - commonly one previously performed in-house - to an external provider. Now, sourcing, which includes outsourcing, is a well-established instrument through which companies can optimize their processes. Within just 5 years, 70 percent of all infrastructures will be outsourced (Century Link, 2014).

Supply chain performance indicators are classified in two clearly defined but closely interrelated categories: functional indicators and end-to-end supply chain indicators. One measures the effectiveness of the function and second measures how well these functions are coordinated. While they are measured separately, they must not be considered in isolation. In a collectivist economy, manufacturing is more frequently directed by the state to supply a centrally planned economy (Keith, 1976).

In mixed market economies, manufacturing occurs under some degree of government regulation unlike in free market economies where manufacturers are left to their own devices. Modern manufacturing includes all intermediate processes required for the production and integration of a product's components. Kenya's Vision 2030 identifies the manufacturing sector as one of the key drivers for realizing a sustained annual GDP growth of 10 per cent. Outsourcing is considered to be one of the major components of Kenya's development blue print (Republic of Kenya, 2007).

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 secondary supply chain processes outsourcing on the supply chain performance of manufacturing firms. Therefore this

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study sought to examine the effect of secondary supply chain processes outsourcing on supply chain performance for manufacturing firms in Nairobi's industrial area.

General Objective

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

Specific Objectives

- (i) To determine the effect of information technology outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area
- (ii) To establish the effect of human resources management outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area.
- (iii) To examine the effect of procurement outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area
- (iv) To determine the effect of returns management outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area

Justification of the Study

The research will also benefit scholars by providing them with a foundation for further research into the study of outsourcing of supply chain processes and supply chain performance. Scholars will also benefit from a prior use of a descriptive research design in the study of the subject. As previously noted, 44% percent of firms globally have integrated supply chain processes outsourcing into their operations (Eurostat, 2012) therefore this research will be of importance to these firms, especially those in the manufacturing sector, that are already undertaking supply chain processes outsourcing in helping them understand its effect on supply chain performance for them in the market beyond the obvious benefits.

Limitations of the Study

The study will be limited to the four objectives that have been specified earlier in the chapter. In the general objective the researcher intended to establish the effect of secondary processes outsourcing on supply chain performance for manufacturing firms in Nairobi's Industrial Area. In this objective the researcher was limited to the variables of information technology, human resources management, procurement and returns management.

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

The key differentiator between primary and support processes, is that support processes do not generate direct value to customers while the primary processes do. Secondary activities are: Procurement - is the acquisition of inputs, or resources, for the firm; Human Resource management - consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel; Technological Development - pertains to the equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs; Infrastructure - serves the company's needs and ties its various parts together, it consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, quality assurance and general management (Porter, 1985).

Dietz (1994) states that each of the support processes can involve a life cycle of resources and are often associated with functional areas (However, support processes can and usually cross functional boundaries. For example, the process of managing ability, does not deliver direct value to the customer, but supports the Organization's ability to deliver products and services. The SCOR model integrates the concepts of business process reengineering, benchmarking, and process measurement into a cross-functional framework which consists of three level: the top one (level I) deals with process types, level II is the configuration level and deals with process categories, and level III is the process element level. Based on the premises that the better the alignment between marketplace and the strategic response of a SC, the better the bottom-line performance, its main aim is to improve such alignment. Its strength is that it provides a useful tool for the upper management to facilitate communication. The SCOR model has been proposed as a tool useful for the management and integration of the SC. Specifically, the two lowest levels may help in defining indicators for the measurement of

SC performance, thus helping the quality improvement of the SC as a whole. The indicators proposed by the SCOR model can be classified within 5 different classes, namely: reliability, responsiveness, agility, cost, coordination and assets (Bigliardi & Bottani, 2014).

Empirical Literature Review

Loukis and Arvanitis (2011) conducted a study on outsourcing and Firm Performance –A Comparative Study of Swiss and Greek Firms. Their objectives were analyzing the factors determining the firms’ propensity to outsource various processes determining the impact of outsourcing on firms’ innovation performance as well as labour productivity. The research adopted a survey research design. They found that the productivity effects seem to be considerably weaker than the innovation effects. Outsourcing activities tend to enhance innovation, particularly process innovation, but only weakly directly productivity; the productivity effects seem to be intermediated (at least for Switzerland) by R&D investment in new products and processes.

Mukiri (2011) conducted a study titled Factors Influencing Outsourcing of Services in Selected State Corporations in Kenya. The purpose of the study was to find out factors that influence outsourcing of services in some selected State Corporations in Kenya. The study findings show that the major benefits derived from outsourcing of services include introduction of workforce flexibility by outsourcing the peripheral workforce; the problem of managing industrial relations is minimized; reduced costs and increased efficiency; and focus on core competencies. However, there were major challenges faced by state corporations in the implementation of outsourcing process.

III. RESEARCH METHODOLOGY

The function of a research design is to ensure that the evidence obtained enables one to answer the initial question as unambiguously as possible (Jalil, 2013). This study adopted a descriptive research design. Cohen, Manion and Morrison (2007) state that the objectives of a descriptive research are to identify present conditions and point to present needs. 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 1. Sample Size

Target Population	Sample Size	Percentage
358	108	108

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 DISCUSSION

Out of the administered 108 questionnaires, 104 were returned fully completed while 4 were returned 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 secondary processes which include information technology, human resources management, procurement and returns management. 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

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. Table 2 indicates that, 81 organizations indicated that they did not outsource their secondary functions thus gaining a supply chain performance improvement of less than 50%. It was observed that thirteen (13) organizations that outsourced their secondary processes gained supply chain performance improvement of greater than 50%. This is indicative that secondary processes outsourcing has a relationship with supply chain performance as 9 companies that outsourced more than 80% of their secondary functions got greater than 50% improvement in supply chain performance.

Table 2. Cross Tabulation between Secondary Processes and Supply Chain Performance

Secondary Processes * Supply chain performance Cross tabulation						
			Supply chain	Performance	Total	
			Lowest	Highest		
Secondary Processes	0%-20%	Count	16	3	19	
		Expected Count	14	5	19	
	21%-40%	Count	12	2	14	
		Expected Count	10	4	14	
	41%-60%	Count	31	15	46	
		Expected Count	33	13	46	
	61%-80%	Count	10	5	15	
		Expected Count	11	4	15	
	81%-100%	Count	5	5	10	
		Expected Count	1	9	10	
	Total		Count	74	30	104
			Expected Count	74	30	104

Table 3 indicates that the calculated value of the Chi-Square statistic was 5.66 at 4 degrees of freedom. Because of the significance level of 0.0005 which is less than the threshold of 0.05, it can be clearly observed that there is a significant association between secondary processes outsourcing and supply chain performance as shown in Table 3.

Table 3. Chi-Square Tests between Secondary Processes and Supply Chain Performance

Chi-Square Tests					
	Value	Df	Asymp. Sig. (2 sided)		
Pearson Chi-Square	5.66877	4	0.0005		
Likelihood Ratio	5.857741	4	0.0100		
Linear-by-Linear Association	4.807596	1	0.0008		
N of Valid Cases	104				
A	3 cells (30.0%) have expected count less than 5. The minimum expected count is 2.88.				

The association between the two variables was strong with a contingency value of 0.727 which was statically significance sig=0.005 as shown in Table 4.

Table 4. Symmetric Measures between Secondary Processes Supply Chain Performance

Symmetric Measures				
		Value	Approx. Sig.	
Nominal by Nominal	Contingency Coefficient	0.727354167	0.005287973	
N of Valid Cases		104		
A	Not assuming the null hypothesis.			
B	Using the asymptotic standard error assuming the null hypothesis.			

Correlation

A simple Pearson’s correlation was used to confirm the results of the regression analysis, according. 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 secondary processes outsourcing has a positive correlation with supply chain performance as the r value was 0.592 this shows that whenever the secondary process outsourcing increase by 1, the supply chain performance improves by 0.592 as shown in Table 5.

Table 5. Correlation between Secondary Processes Outsourcing and Supply Chain Performance

Correlations			
		Supply chain performance	Secondary processes
Supply chain performance	Pearson Correlation	1.000	0.592
	Sig. (2-tailed)		0.012
	N	95.000	93.000
Secondary processes	Pearson Correlation	0.592	1.000
	Sig. (2-tailed)	0.012	
	N	93.000	102.000
*	Correlation is significant at the 0.05 level (2-tailed).		

Regression analysis between Secondary process outsourcing and supply chain performance

The general objective tried to establish whether secondary process outsourcing had a significant effect on supply chain performance. This objective was tested by regressing secondary process outsourcing and supply chain performance guided by the equation $Y = \beta_0 + \beta_1 X$ where X represented secondary process outsourcing and Y denoted Supply chain performance. The results of the regression are presented in Table 6 which displays R (the correlation between the observed and predicted values of the dependent variable), which is .593. This is a 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 .5265. This means that 52 % of the variation supply chain performance

(dependent variable) can be explained from outsourcing secondary processes. The value of the standard error (sy/x) is shown in the output as .418 The regression was a fair fit describing 52.65 % of the variance in secondary business outsourcing system $R^2_{adj}=47%$ this indicates only a slight overestimate with the model

Table 6. Model Summary for Secondary Process Outsourcing and Supply Chain Performance

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.59355	0.5265	0.47015	0.418115		
A	Predictors: (Constant), Secondary 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 1.14 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 15.906, df as 91 and a mean square of 0.174. The overall relationship was statistically significant ($F_{1, 92}=6.525$, $p<0.05$) 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 Secondary Process Outsourcing and Supply Chain Performance

ANOVA(b)						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.147265	1	1.147265077	6.56255828	0.002059
	Residual	15.9086	91	0.174819792		
	Total	17.05587	92			
A	Predictors: (Constant), Secondary processes					
B	Dependent Variable: Supply chain performance					

Table 8 represents coefficients of all the independent variables and the dependent variable. It can be noted from the significant column that the predictor is significant at 0.0028 this is less than 0.05. It can be observed that every time secondary process outsourcing is increased by 1 unit, supply chain performance is improved by 0.15 units, when all other variables are held constant.

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

Coefficients(a)						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.042005	0.187146		16.2547134	0.0028
	Secondary processes	0.15841	0.061837	0.25935522	2.5617491	0.0020
A	Dependent Variable: Supply chain performance					

These findings show that the outsourcing of secondary supply chain processes leads to the improvement of supply chain performance. These findings contradict those of Greenberg (2013) who states that the effects of outsourcing include cost containment and the need to focus on core business operations are at the top of the list of several common reasons to outsource selection. Outsourcing all of selection or just part of selection process puts the reins in the hands of experienced selection consultants, saving time and money. Other reasons employers choose to outsource selection include a need to improve selection processes, reduce a high turnover rate, control rapid growth or seasonality that makes it impossible to keep up with hiring needs, develop supply chain performance, and coordinate

recruiting and on-boarding. These findings mirror those of Landgraf (2012) who found out that outsourcing of negotiations results in Reduced costs and increased quality; improved access to goods and/or services; increased supply chain efficiency; best value; improved competitiveness; policy/procedure creation, implementation, validation; ability to focus on core competencies; lower procurement related labor costs; overall procurement performance improved; organization and internal cost performance; data for benchmark analysis, goals, and results; and hedges against future cost increase of raw materials. This study concludes that the outsourcing is likely to have mixed results for the firm in terms of supply chain performance.

V. SUMMARY OF FINDINGS AND CONCLUSIONS

The research found that secondary supply chain processes outsourcing leads to the creation of supply chain performance. It was found that the outsourcing of ICT related activities had a greater influence on the creation of supply chain performance as compared to the other two sub-variables, namely human resources management and procurement. Procurement was found to be core to the operation of a firm and hence its outsourcing was minimal, while the outsourcing of human resource management was found to mostly done on an adhoc basis in most firms due to the sporadic nature of human resources requirement.

RECOMMENDATIONS

In an attempt to create a supply chain performance for manufacturing firms, they should outsource their secondary supply chain activities. However this outsourcing should focus on ICT and human resources management activities, but due to the sensitive and close nature of procurement, it should be undertaken within the firm. However where a firm lacks the necessary resources to undertake procurement related activities such as contract management they should be outsourced to adequately resourced firms.

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