REVERSE LOGISTICS AND PERFORMANCE OF FOOD AND BEVERAGE PROCESSING SECTOR IN KENYA

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ABSTRACT

This study sought to establish the effect of reverse logistics on performance of food and beverage processing firms in Kenya. The study adopted the theory of reasoned action and institutional theory to instigate the hypotheses. The study used an explanatory research design whereas the target population for study was the key staff in supply chain, production and safety and environment or equivalent managers in the 187 food and beverage processing firms in Kenya. Purposive sampling technique was used since a census of all the 187 food and beverage processing firms was carried out, the data collection instrument was a structured questionnaire and to accomplish the five objectives, five hypotheses were developed and tested. Data analysis was conducted using descriptive statistics and inferential statistics further other statistical tests were done in the study. Presentation of data in form of charts and tables was deemed appropriate for this study. The study found that reverse logistics had a significant and positive influence on performance of food and beverage processing companies in Kenya. The study further found that government regulations had a significant moderating effect on the relationship between reverse logistics and performance of food and beverage processing companies in Kenya. This study therefore concluded that reverse logistics as a green supply chain management practice when properly implemented leads to higher performance in the food and beverage processing sector in Kenya. It recommended that a proper framework of reverse logistics should be put in place so as to steer firm performance.

Key Words: Reverse Logistics, Green Supply Chain Management, Food and beverage processing companies
1.0 INTRODUCTION

1.1 Background of the study
Supply chain management (SCM) plays a central role in the firm’s global competitiveness. A supply chain is a network of buyers and suppliers, Returns management is a costly exercise for organizations, it is necessitated by products that are expired, recalled, damaged packaging or delivered incorrectly (Sameer et al 2009). Returns handling can be measured in terms of volumes handled to indicate the size of the operation. According to Sameer et.al. (2009) returned products can be handled up to four times, while adds no value to the customer, yet adds significant cost to the supply chain. Most organizations must deal with product returns for various reasons, for instance, customers change their minds, items are damaged or have quality problems, merchandise is unsold, or products are returned at the end of their usable life. Investment recovery/re-manufacturing captures value through resell and reuse of used materials; reverse logistics programs help firms manage product end-of-life and investment recovery processes. Recovery efforts represent strategic resources that require complex coordination efforts with both upstream and downstream supply chain partners (Kirchoff et al., 2016).

The food & beverage industry is the largest sector and constitutes 22 percent of total KAM membership, the sub-sectors under this includes; dairy products, alcoholic beverages, spirits, juices, bakers & millers, water, cocoa, carbonated soft drinks, chocolate & sugar. Food processing entails the transformation of raw ingredients into food or transformation of food into other forms that can be consumed by humans or animals.

Supply chain performance refers to the evaluation of supply chain management, and includes both the tangible and intangible factors (Chang et al., 2013). Performance measurement is the process of quantifying the effectiveness and efficiency of action where measurement is the process of quantification and action leads to performance (Arif-Uz-Zaman et al., 2014). Effectiveness is the extent to which a customer’s requirements are met and efficiency is a measure of how economically a firm’s resources are utilized when providing a pre-specified level of customer satisfaction. Performance measurement systems (PMS) are described as the overall set of metrics used to quantify both the efficiency and effectiveness of action (Arif-Uz-Zaman et al., 2014). The essence of performance measurement is to identify whether customer needs are met, bottlenecks and wastages, further it comes in handy on decision making to ensure that management decisions are based on facts.

1.2 Statement of the Problem
The Kenyan manufacturing sector has recorded dismal performance compared to other sectors, Statistics from the Kenya National Bureau of Statistics showed that the sector performed dismally compared to other sectors with a growth rate of 3.5 in the year 2016, Agriculture posted 4.4 percent, energy 6.5 percent, transport and storage 7.2 percent and building and construction at 9.2 percent. The weak performance can be attributed to high operations cost hence there’s need to investigate the underlying relationships among the green supply chain management practices adoption and organizational performance.

Other empirical studies in this area have been conducted before, the notable ones include; Rao & Holt (2005), Green et al.,(2012) and Runala and Zaffar (2015) found a positive relationship
between environmental practices and organizational performance, whereas other studies such as De Giovanni and Esposito Vinzi (2012) and Huang et al., (2012) proved that there were no significant relationships between such practices and organizational performance, therefore this study tried to prove it in the African Context.

1.3 Objective of the Study
1. To investigate the effect of Reverse logistics on performance of food and beverage processing Sector in Kenya.

1.4 Research Hypothesis
1. H1 Reverse Logistics has a positive significant effect on performance of food and beverage processing sector in Kenya.

2.0 LITERATURE REVIEW

2.1 Theoretical Review
2.1.1 Institutional Theory
Institutional theory examines the influence of external pressures on the firm (Hirsch, 1975; Lee et al., 2013) and how enterprises adopt policies and implement strategies that are legitimate within their organizational fields (Scott & Christensen, 1995; Lee et al., 2013). Further organizations consider industry norms, firm tradition, and management fads, among other concerns, to formulate their strategies (Lee et al., 2013). Thus, firms are required to implement green strategies because of increased external pressure for sustainability (Lee et al., 2013) in the form of compulsory environmental regulations that are directly related to GSCM further firms should look to their external pressures and prepare countermeasures with diverse GSC since such practices can positively affect environmental and economic performance, and SC agility and flexibility. Narasimhan & Carter (1998) stated that companies have institutionalized environmental practices because of pressure from external and internal forces as well as an awareness of the consequences of non-compliance with environmental imperatives. If companies have a legitimate concern for the environment and there is social approval, then environmental practices will be deployed more rapidly throughout the supply chain (Carter et al., 2000).
2.2 Conceptual Framework

<table>
<thead>
<tr>
<th>Reverse Logistics</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Returns.</td>
<td></td>
</tr>
<tr>
<td>• Remanufacturing.</td>
<td></td>
</tr>
<tr>
<td>• Recycling.</td>
<td></td>
</tr>
<tr>
<td>• Re-use.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.1: Conceptual Framework

2.3 Empirical Literature Review

2.3.1 Reverse Logistics

Reverse logistics entails planning, implementation, and control of the efficient & cost-effective flow of raw materials, work in process inventory, finished goods and related information from the point of consumption to the point of origin in order to create value and proper disposal (Sharma et.al., 2016; Hawks, 2006). Further, reverse logistics can incorporate remanufacturing and refurbishment.

The primary focus of reverse logistics is the reverse flow of materials from customers to suppliers with the aim of maximizing value from the returned items or reduce the total cost incurred, such products can be sorted for re-use, re-manufacture, re-cycle and disposal (Sharma et al., 2016). Previous studies have shown that recovery of used products is more economically sound than disposal hence organizations are very keen on this concept. Sharma et.al., (2016) asserts that proper planning and implementation of reverse logistics could accrue profits, customer satisfaction and socio-economic benefits to the organization.

Reverse logistics has become a competitive necessity for many firms, recently the concept of reverse logistics has gained significant attention in both academia and practice, due to a variety of reasons especially those pertaining to environmental concerns (Sajan et.al., 2017). There’s need for the food and beverage processing firms to handle the reverse logistics function appropriately owing to the cost associated with the process. A study by Min & Ko (2008) established that organizations have not been keen to return merchandise until things get out of control. Reverse logistics practices usually reduce organizations current assets as it lowers returned products, inventory value and lengthens order cycle time due to shipping of ordered items, further Min & Ko (2008) states that it causes organization to lose sale and thus sales revenue.
It is imperative to dispose off products in a proper manner after their useful life, failure to which it may pose a serious harm to the ecological environment, the management of returned products is an hazardous task as it requires special logistics requirements hence there’s need to design a proper reverse logistics network. According to Melo et. al., (2014), the network design decision entails site selection for the location of new facilities, determination of numbers and size of facilities, identifying the channels of distribution and transportation requirements to meet customer needs.

Reverse Logistics entails planning, implementing & control of the flows of raw materials, work in process inventory & finished goods from a manufacturing, distribution or use point to a point of recovery or point of proper disposal. Concern about environmental issues such as pollution, traffic congestion, global warning, and disposal and clean up hazardous materials has led to a number of environmental laws and directives that affect logistics systems design and strategies hence reverse logistics is one of the critical component of GSCM practices.

3.0 RESEARCH METHODOLOGY

3.1 Research Design
Explanatory research design was used given that the study aimed at examining the impact of green supply chain management practices on firm’s performance. This research design is appropriate since it is quantitative in nature hence hypotheses can be tested by measuring the relationships between variables, further it will facilitate data analysis using statistical techniques. The performance constructs are; quality, lead time, cost and market delivery.

3.2 Target Population
The population of interest in this study were managers in supply chain/production and safety & environment working for the 187 food & beverage processing firms in Kenya being the unit of analysis, one response per firm. The production/supply chain and safety & environment managers were chosen because the study was about a major activity of Supply Chain Management further they have a better understanding of Green initiatives in the Supply Chain.

3.3 Sampling Technique and Sample Size
A Census survey was conducted to all the 187 Food & Beverage processing firms registered with the Kenya Association of Manufacturers being the unit of analysis. The unit of observation comprise Senior Managers in Supply Chain, Production and Safety & environment for the 187 Food and Beverage processing firms.

The study adopted purposive sampling technique since the total population of 187 firms were to be sampled.

3.4 Data Collection Methods
The data used in this study consist of questionnaire responses from managers in Kenyan food & beverage processing firms, the survey instrument with a research permit and a cover letter introducing the research & briefly explaining the objectives and including instructions for completion. The questionnaires were administered to a subset of the population of interest that comprised of managers with knowledge of their organizations Supply Chain Activities i.e Supply Chain Managers, production managers and safety & environment managers.

3.5 Data Analysis and Presentation
The survey data was analysed using Descriptive and Inferential Statistical analysis techniques, descriptive statistics gives the profile of the respondents i.e. frequencies and their percentages whereas inferential statistics adopted Moderated Multiple Regression Analysis Model in order
to determine the effect of explanatory variables on the issues of Green Supply Chain Management practices on firm’s performance in the Food & Beverage processing sector in Kenya. A statistical analysis was done using multivariate method since the data arose from more than one variable. Owing to the existence of a moderator as the fifth variable moderated multiple regression analysis model was deemed appropriate.

Inferential statistics was used to test & validate the hypothesised relationships between green supply chain management practices & performance, the responses were coded and analysed using SPSS statistical programme Version 24. Multivariate analyses was used to process the survey data results based on likert scale evaluations that allowed statistical & graphical representation.

4.0 FINDINGS AND DISCUSSION

4.1 Response Rate
The study sought to collect data from 187 managers in the food and beverage processing firms in Kenya, out of the 187 managers, 161 gave adequate information required for analysis. Hence the survey had a response rate of 86.1%.

4.2 Descriptive Findings

4.2.1 Reverse Logistics
The findings are shown in table 4.1 below, on the first statement that the company’s supply chain framework provided better product return frameworks and channels, most of the respondents agreed with the statement as evidenced by a mean of 4.29 and a standard deviation of 0.99 while on the second statement that the organizations designed products that could be remanufactured, most of the respondents agreed neither agreed nor disagreed with the statement as shown by a mean of 3.49 and a standard deviation of 1.28. On the third statement that the organizations designed recyclable products, a slight majority of the respondents agreed with statement as shown by a mean of 3.65 and a standard deviation of 1.27. The findings imply that reverse logistics is not highly upheld in the food and beverage processing companies an aspect that could sabotage their supply chain performance.

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The firms supply chain framework provides for product Returns.</td>
<td>161</td>
<td>4.29</td>
<td>0.99</td>
</tr>
<tr>
<td>The organization designs products that can be remanufactured.</td>
<td>161</td>
<td>3.49</td>
<td>1.28</td>
</tr>
<tr>
<td>Our organization designs products that are recyclable.</td>
<td>161</td>
<td>3.65</td>
<td>1.27</td>
</tr>
<tr>
<td>Our organization designs products that are reusable.</td>
<td>161</td>
<td>3.45</td>
<td>1.37</td>
</tr>
<tr>
<td>Use-of-returnable-packaging-material</td>
<td>161</td>
<td>3.75</td>
<td>1.35</td>
</tr>
<tr>
<td>Manufacture-of-products-which-can-be-incinerated</td>
<td>161</td>
<td>3.82</td>
<td>1.23</td>
</tr>
</tbody>
</table>
4.2.3 Performance
The study sought to find out the performance of food and beverage processing companies in Kenya as the dependent variable for the study. The main measures used to unveil the performance of the companies as far as supply chain is concerned included the environmental aspects, cost containment, quality of the products as well as financial capacity of the firms. The findings are therefore presented based on these measures.

Table 4.6: Performance

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average-return-on-investment-over-the-past-three-years</td>
<td>4.09</td>
<td>0.78</td>
</tr>
<tr>
<td>Profit-growth-over-the-past-three-years</td>
<td>3.96</td>
<td>0.76</td>
</tr>
<tr>
<td>Average-return-on-sales-over-the-past-three-years</td>
<td>3.94</td>
<td>0.85</td>
</tr>
<tr>
<td>Average-market-share-growth-over-the-past-three-years</td>
<td>3.87</td>
<td>0.71</td>
</tr>
<tr>
<td>Average-sales-volume-over-the-past-three-years</td>
<td>3.88</td>
<td>0.74</td>
</tr>
</tbody>
</table>

4.3 Regression Analysis

Influence of Reverse Logistics on performance of food and beverage processing firms in Kenya.

H1: Reverse logistics has a positive significant effect on performance of food and beverage processing sector in Kenya

The study sought to find out the relationship between reverse logistics and performance of food and beverage processing companies in Kenya. The statistical relationship between the two variables was sought through regression model whereby the output was generated in terms of model summary, ANOVA and regression coefficients. The model adopted herein was of the form: Y = α₀ + β₃X₃ + ε. The findings on the model summary as shown in table 4.7 revealed that the R² for the model was 0.161 an indication that the variation of supply chain performance was explained by up to 16.1% by reverse logistics.

The ANOVA results on the other hand revealed that at an F-calculated of 30.44, the model was significant at a significant level of 0.000<0.05. This implies that the supply chain performance of the food and beverage processing firms could be explained by reverse logistics and that the model was significant to give a direction on whether to accept of fail to accept the alternative hypothesis.

The regression coefficients shown in table 4.18 on the other hand revealed that at a beta coefficient of 0.347, reverse logistics significantly and positively influenced supply chain performance at a significance level of 0.000. The model now becomes: Y = 2.876 + 0.347X₃ + ε. This implies that a unit change in reverse logistics leads to 34.7% increase in supply chain performance among food and beverage processing companies in Kenya. This therefore gives a go-ahead to accept the alternative hypothesis of the study that reverse logistics have a significant and positive influence on the supply chain performance of food and beverage processing companies in Kenya.
Table 4.7: Regression Results for Reverse Logistics

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.401&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.161</td>
<td>.155</td>
<td>.44061</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Reverse Logistics

ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>5.910</td>
<td>1</td>
<td>5.910</td>
<td>30.440</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>30.868</td>
<td>159</td>
<td>.194</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36.778</td>
<td>160</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Dependent Variable: Firm Performance
<sup>b</sup> Predictors: (Constant), Reverse Logistics

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.876</td>
<td>.255</td>
<td>11.274</td>
</tr>
<tr>
<td></td>
<td>Reverse Logistics</td>
<td>.347</td>
<td>.063</td>
<td>.401</td>
</tr>
</tbody>
</table>

<sup>a</sup> Dependent Variable: Firm Performance

CONCLUSION

The study found out a significant influence of reverse logistics on performance, this could be attributed to a framework for waste reduction and cost mitigation through the concept of reverse logistics within the food manufacturing supply chain. The study concluded that efficient and effective management of reverse logistics in the food and beverage manufacturing firms led to better performance.

RECOMMENDATIONS

Correspondingly the study recommended the adoption of reverse logistics as a strategy to boost manufacturing firms’ performance. The study established that there is a positive significant relationship between reverse logistics and firms performance and there’s need to invest in a sustainable reverse logistics framework for the manufacturing firms. By so doing the organization will leverage on enhanced performance. Further legislations as a moderator has a positive significant influence on performance with respect to the reverse logistics practice.

The study finally recommended a full compliance of existing legislations governing the firms operations that would complement the green supply chain management practices, these are ISO certifications, environmental regulations, regulatory compliance and other environmental policies. The adoption will depend on the size of the organization, its impact on the ecological environment and the nature of raw material it absorbs.
REFERENCES


