

# Relationship between Reverse Transportation and the Performance of Imported Furniture Distributing Firms in Nairobi County

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**Abstract:** The study sought to examine how reverse transportation affects Imported Furniture Distributing Firms in Nairobi County. The Inventory theory and Theory of Constraints guided the study. This study adopted the descriptive Survey research design targeting 130 managers drawn from 26 Imported Furniture Distributing Firms in Nairobi County. Simple random sampling technique was used to obtain a sample size of 83 respondents to be used in this study. The study used both primary and secondary data. Primary data was obtained by administering questionnaires to the respondents in the companies while secondary data was obtained from the firms' inventory records. Data was analysed using both descriptive and inferential statistical methods. It was established that reverse transportation significantly affected the performance of imported furniture distributing firms in Nairobi County as most of the furniture distribution firms had forward-looking supply systems and as such did not anticipate back-flow of items. It is recommended that the management of the firms need to make provision for product retrievals in their distribution cycles.

**Keyword:** Reverse transportation, performance and Imported Furniture Distributing Firms.

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## I. INTRODUCTION

Today return flows are becoming the norm rather than the exception. Growing environmental concern and population emphasizes the reuse of products and materials. Some of the countries have gone to extent of charging manufacturer for the entire life cycle of their product. In near future the world is going to witness explosive growth of product recovery activities and at the same time companies are recognizing opportunity to access this new market segment combining with environmental stewardship (Pollack, 2015). Rogers and Tibben-Lembke (2008) define reverse logistics as the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal. Even though this definition fully reflects the idea of reverse logistics, one alteration should be done. Depending on the type of reverse process employed, products may not necessarily be returned to their point of origin, but to a different point for recovery (De Brito & Dekker, 2003). According to Lebreton (2007), reverse logistics is the process of moving goods from their point of consumption to a consolidation point for the purpose of capturing value or proper disposal. It encompasses the collection of goods, transportation to a central location, and sorting according to ultimate destination, e.g., remanufacturing, refurbishing, reusing or recycling. By closing the loop of product lifecycles, reverse logistics plays an important role to transitioning to a circular economy (UPS, 2014; GreenBiz, 2015). In this fashion, it can be seen that reverse logistics is instrumental in recapturing product value. Reverse logistics can be used to enhance the organization's customer service capabilities by communicating and convincing the market place concerning the capabilities of the organization to create and preserve value for their products (Kariuki & Waiganjo, 2014). Some of the widely recognized benefits of reverse logistics include; Improved customer contentment and retention, Reduction in the acquisition of parts and subassemblies, enhanced revenue and profitability of organization through increased availability of product/service, improved efficiency and effectiveness of the organization, which lead to significant improvement in

the efficiency of the organization (Kannan, Shaligram & Kumar, 2009). Other benefits include; improved time bound sensitivity towards listening to the voice of the customers; it results in anticipation of needs and wants of the customer much ahead before actually they could actually realize it. It also leads to the development of intellectual and emotional bonding with the customers which led to a belief that they made right choice in selecting the firm (Pinna & Carrus, 2012). Reverse logistics also enable the firm to develop interactive partnership with the customer rather than a proactive or reactive partnership.

### **1.1 Statement of the Problem:**

Logistics has become even more complicated when the organization has to repatriate the goods to a different often manufacturing country due to the legal and shipping requirements. At the same time, it is not yet known whether furniture-distributing firms opt to revert the rejected goods back to their stores or to their country of origin and what are the implications on their procurement performance. Previous studies have, however, not examined the how reverse transportation affects the procurement performance of Imported Furniture Distributing Firms in Kenya. Therefore, the present study sought to examine the effects of reverse transportation on the performance of imported furniture distributing firms in the country focusing on Nairobi based firms and their outlets.

### **1.2 Objective of the Study:**

The study was to examine the effects of reverse transportation on the performance of imported furniture distributing firms in the country focusing on Nairobi based firms and their outlets.

### **1.3 Research Hypotheses:**

In conducting the study the following hypothesis was tested

**Ho:** There is no statistically significant relationship between reverse transportation and the performance of imported furniture distributing firms in Nairobi County.

## **II. LITERATURE REVIEW**

### **2.1 Theoretical Review:**

**Inventory Theory:** Inventories occupy the strategic position in the structure of working capital of most business enterprises (Schradly, 1967). It constitutes the largest component of current assets in business enterprises. Inventory means aggregate of those items that are held for sale in ordinary course of business. Therefore, it is imperative to manage inventories efficiently and effectively in order to avoid unnecessary investment in them. An undertaking of neglecting the management of inventories will be jeopardizing the firm's long run profitability (Pandey, 2010). In this study, the inventory theory will provide insight into furniture importing organizations readiness for reverse transportation and their effect on the firms procurement performance.

**Theory of Constraints:** The core idea in TOC is that every system such as profit-making firms must have at least one constraint that limits the system from getting more of whatever it strives for and consequently determines the output of the system (Noreen et al., 1995). A constraint is anything in an organization that hampers the organization's progress or increased throughput such as the reverse flow of products in the case of the present study. Thus, the firm's failure to manage this constraint leads to the significant decline in its productivity. The TOC theory will be used to examine the effects of reverse logistics on the procurement performance of Imported Furniture Distributing Firms.

### **2.2 Empirical Review**

Reverse transportation affects Imported Furniture Distributing Firms When a recall occurs, time is of the essence. Manufacturers must move as quickly as possible to remove affected products from the marketplace, but they also need to consider ways to minimize the cost of unaffected product being erroneously discarded from store shelves. Using a field retrieval force is an effective way of avoiding this unnecessary revenue hit while also ensuring that the recalled product is no longer available to consumers (Barker & Zabinsky, 2008). Companies tap regional retrieval teams to physically visit affected locations—distribution centers, retail stores, medical facilities and others—and separate affected and non-affected product. Assembling and coordinating with field retrieval teams can be a time-intensive process, so it's important that manufacturers factor this into their recall planning process (Lau. & Wang, 2009). Among the key factors to consider in the field retrieval process is transportation. In logistics, transportation refers to the movement of everything from raw material to finished goods between different facilities in a supply chain. In transportation the trade-off between

responsiveness and efficiency is manifested in the choice of transport mode. Fast modes of transport such as airplanes are very responsive but also more costly. Slower modes such as ship and rail are very cost efficient but not as responsive. Since transportation costs can be as much as a third of the operating cost of a supply chain, decisions made here are very important (Yu & Wu, 2010).

Transport system makes goods and products movable and provides timely and regional efficacy to promote value-added under the least cost principle. Transport affects the results of logistics activities and, of course, it influences production and sale. In the logistics system, transportation cost could be regarded as a restriction of the objective market (Tseng et al., 2005). Value of transportation varies with different industries. For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low-valued products, transportation occupies a very big part of sale and affects profits more, and therefore it is more regarded (Ravi, Shankar & Tiwari, 2005). Without well developed transportation systems, logistics could not bring its advantages into full play. Besides, a good transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality. The improvement of transportation systems needs the effort from both public and private sectors. A well-operated logistics system could increase both the competitiveness of the government and enterprises. The transport system is the most important economic activity among the components of business logistics systems. A cross ratio analysis by Chang (2012) revealed that transportation is the highest cost, which occupies 29.4% of logistics costs, and then in order by inventory, warehousing cost, packing cost, management cost, movement cost and ordering cost. The ratio is almost one-third of the total logistics costs. The transportation cost here includes the means of transportation, corridors, containers, pallets, terminals, labours, and time. This figure signifies not only the cost structure of logistics systems but also the importance order in improvement processing. It occupies an important ratio in logistics activities. The improvement of the item of higher operation costs can get better effects. Hence, logistics managers must comprehend transport system operation thoroughly.

According to Pinna and Carrus (2012), the demand for transport in reverse logistics brings out a new market for the third-party logistics industries. As most companies have their transport systems built for forward logistics, others which are not necessarily suppliers can be contracted for reverse logistics. Outsourcing, third-party logistics and contract logistics generally mean the same thing (Tseng, Yue & Taylor, 2005). Traditionally, handled by the firms internally as support functions, logistics activities such as transportation, distribution, warehousing, inventory management, order processing, and material handling have been given low priority compared with the other business functions (Meade & Sarkis, 2012). However, the need for developing sustainable competitive advantage, the growing emphasis on providing good customer service effectively and efficiently, and the strategic value of focusing on core businesses and re-engineering resulted in the evolution of contract logistics which is very different from traditional logistics. One of the most important reasons for outsourcing is that the capabilities of the providers to support their clients with the expertise and experience that otherwise would be difficult to acquire or costly to have in-house (Schwartz, 2010). According to a recent 3PL survey, the most common outsourced activities are warehousing, outbound transportation, customs brokerage, and inbound transportation. Outsourcing has given many third party providers with a unique opportunity to enter the reverse logistics market (Pinna & Carrus, 2012). These outsource suppliers have become specialists in managing the reverse flow and performing key value-added services, such as remanufacturing and refurbishing. In addition, often the outsource suppliers perform reverse activities in an improved manner and their customers often find outsourcing as a way of reducing their administrative hassle. Kannan et al. (2009) identified many reasons for companies to outsource reverse logistics activities, some of which are:

### **III. METHODOLOGY**

#### **3.1 Research Design, Target Population and Sampling**

This study adopted a descriptive survey research design to establish the effects of reverse transportation on imported furniture distributing firms in the country focusing on Nairobi based firms and their outlets. Descriptive research involves the description of the status of affairs as it exists. The total number of registered Imported Furniture Distributing Firms in Nairobi County is 21. The study also included 5 leading supermarkets and at least two of their branches in the County which have well developed imported furniture departments. This study targeted the overall management, the logistics manager, sales manager, inventory manager, stores manager and accounts manager from each firm. Therefore, the entire population under consideration in this study was 130 persons. This population was chosen as they are deemed to be in a position to provide reliable information for the study purposes. The required sample size was obtained using simple



Cronbach Alpha. The value of Cronbach’s Alpha was above 0.8913 which is above the threshold of 0.7 hence the questionnaire used in the study was reliable enough in measuring the content it measured with high degree of reliability hence the questionnaire could give similar result if used repeatedly in different studies.

#### 4.2 Demographic analysis:

The background information that was retained for analysis relating to the respondents included: majority (66%) of the respondents were male while the females constituted 34%. This was a significant representation of the respondents that avoided biases associated with gender-imbalanced studies. Over half (51%) of the respondents were found to be aged between 26 to 35 years suggesting that most of the imported furniture firms in the area were employing young people. This revelation corresponds to the nature of age structure of most developing countries which are mostly composed of youths. Also according to the findings, most (77%) of the respondents were highly educated having attained post-secondary level of education. This levels of qualifications among the staff meant that the firms were in position to enhance their performance as their staff were well educated. The study also found that most (42%) of the respondents had a working experience of between 2 and 5 years. Those who had worked closely followed this between 6 and 9 years in the firms (35%). As such were expected to be conversant with the study problem under investigation and provide reliable information for the study. Imported furniture distributing firms (49%) have been operating in the area for between less than 13 years. Most (38%) the firms had one branch in the area implying that most were either new firms or were focusing on a specific market segment in their area of operation. Majority (41%) sourced their goods from Malaysia and Dubai (32%). The findings also indicate that most (81%) of the firms returned the rejected furniture to their stores for reconditioning or redistribution. However, the firms not repatriate the rejected furniture to the manufacturer owing to cost implications and the regulations governing international logistics.

#### 4.3 Reverse transportation of furniture distributing firms:

The objective of this study was to examine how reverse transportation affects procurement performance of imported furniture distributing firms in Nairobi County. The status of effects of this variable was rated on a 5 point Likert scale ranging from; 1 = strongly disagree to 5 = strongly agree and were analyzed using the mean score. The closer the mean score on each score was to 5, the stronger the agreement was to the statement posed. A score around 2.5 would indicate uncertainty while scores significantly below 2.5 would suggest strong disagreement with the posited statements. The results on this are summarized in Table 1.

**Table 1: Reverse transportation and procurement performance of furniture firms(N=83)**

Statement	Mean	Std. Deviation
We always make provision for product retrievals in our distribution cycles	2.79	1.084
We inform our customers in advance so as to ensure they emplace the rejected furniture in the designated area during the reverse distribution cycles	2.58	0.838
Our distribution cycles are only limited to the city and its suburbs and not beyond	3.37	0.496
We do not charge for retrieval costs within our distribution cycles	3.68	0.671
We do make arrangements with clients outside the distribution areas on the costs of product retrieval	3.58	0.769
Product retrieval can be very costly transport wise and hence we only limit retrieval to value and quantity of products	4.42	0.607
We do contract third parties to assist with product retrievals	2.21	1.316
Our third party retrieval partners are required to work within our cycles so as not to conflict with our plans	1.55	0.612
<b>Aggregate Scores</b>	<b>3.02</b>	<b>0.799</b>

Table 1 reveal that the firms did not always make provision for product retrievals in their distribution cycles (mean = 2.79) and, as such, they did not inform their customers in advance so as to ensure they emplace the rejected furniture in the designated area during the reverse distribution cycles (mean = 2.58). The results also indicate that the furniture distribution cycles in most firms were only limited to the city and its suburbs and not beyond (mean = 3.37) and most did not charge for product retrieval costs within their distribution cycles (mean = 3.68). However, most of the firms made arrangements with their clients outside the distribution areas on the costs of product retrieval when necessary (mean = 3.58) as most maintained that product retrieval can be very costly transport wise and, hence, limiting retrieval to only value and quantity of products (mean = 4.42). It also emerged that most firms do not contract third parties to assist with

product retrievals (mean = 2.21) and consequently the third party retrieval partners did not work within their cycles (mean = 1.55). These findings imply that most of the firms supply chain transport systems were configured in the forward direction and as such could not cater effectively for reversal of products that were considered expensive and time consuming. These findings agree with Yu and Wu (2010) and Chang (2012) who found out that transportation costs can be as much as a third of the operating cost of a supply chain. The transportation costs include the means of transportation, corridors, containers, pallets, terminals, labours, and time, therefore, the firms avoided bulky and delicate goods which they felt would lead to similar costs to the ones in the forward distribution systems. The findings however, disagreed with Pinna and Carrus (2012) who established that the demand for transport in reverse logistics brings out a new market for the third-party logistics industries

#### 4.4 Procurement performance of imported furniture distributing firms in Nairobi County:

Finally, the study sought to determine the financial performance of imported furniture distribution firms in Nairobi county. This was the dependent variable and was measured by asking the respondents to respond to various statements describing the procurement performance of their firms resulting from reversed logistics. The status of effects of this variable was rated on a 5 point Likert scale ranging from; 1 = strongly disagree to 5 = strongly agree and were analyzed using the mean score. The closer the mean score on each score was to 5, the stronger the agreement was to the statement posed. A score around 2.5 would indicate uncertainty while scores significantly below 2.5 would suggest strong disagreement with the posited statements. These results are presented in Table 2.

**Table 2: Procurement performance of imported furniture distributing firms (N=83)**

Statement	Mean	Std. Deviation
Our company experiences high product recalls from time to time	2.16	0.958
Product rejection only affects particular types of products	3.66	0.692
We are able to recycle and recover the value of more than half of the goods reversed by our clients	3.81	0.507
Before we began reversing our products we used to endure significant losses	3.21	0.882
Through successful product recovery, we are able to raise our profit margins substantially	3.47	0.612
Through product reversals, we have been able to boost our customer loyalty	3.99	1.119
Well managed product reversals in our firm has increased value to our customers	3.53	0.612
Our company sales volumes have increased due to management of reverse logistics	3.71	1.259
<b>Aggregate Scores</b>	<b>3.44</b>	<b>0.83</b>

The results in Table 2 indicate that most of the firms did not experience high product recalls from time to time (mean = 2.16) probably owing to their quality assurance systems. As a result, product rejection was mostly confined to particular types of products (mean = 3.66). The findings also indicate that most firms were able to recycle and recover the value of more than half of the goods reversed by their clients (mean = 3.81). Most respondents admitted that before they began reversing their products, they used to endure significant losses (mean = 3.21), however, through successful product recovery, they have been able to raise their profit margins substantially (mean = 3.47). Further, through product reversals, most firms have been able to boost their customer loyalty (mean = 3.99) and the well managed product reversals in the firms has increased value to their customers (mean = 3.53). Other findings also indicate that the firms sales volumes have increased due to management of reverse logistics (mean = 3.71). These findings imply that the introduction of reverse logistics management systems had considerably improved the performance outlook of the firms. These findings are consistent with Kannan et al, (2009) and Pinna and Carrus (2012) regarding the benefits of reversed logistics management such as; improved customer contentment and retention, enhanced revenue and profitability of organization through increased availability of product/service, improved efficiency and effectiveness of the organization, and enable the firm to develop interactive partnership with the customer rather than a proactive or reactive partnership.

#### 4.5 Correlation Analysis:

In this subsection the correlation analysis using the Pearson Product Moment Correlation was made to first determine the degree of multicollinearity between the independent variables and also show the degree of their association with the dependent variable separately and the resulting correlation matrix given in Table 3

**Table 3: Summary of Correlations**

		Reverse Trasportation	Performance of firms
Reverse Transportation	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	83	
Performance of Firms	Pearson Correlation	0.267	1
	Sig. (2-tailed)	0.016	
	N	83	83

The first correlation was done to determine whether there was a statistically significant relationship between reverse transportation and performance of imported furniture distributing firms in Nairobi County. The results in Table 3 shows that there was indeed a significant relationship ( $r = 0.267$ ;  $p \leq 0.05$ ). Further, the Pearson’s product moment coefficient of correlation  $r = 0.267$  is low and suggests a weak and positive relationship exists between the variables, hence, suggesting that transportation did not have much influence over the reverse logistics decisions in the furniture distributing firms probably owing to the fact that transportation was mostly organized by the firms in restricted circuits within the County.

**4.6 Regression Analysis:**

The study used simple OLS Regression analysis that was multiple in natures as there were five independent variables. The independent variable reverse transportation The dependent variable was performance of imports distribution businesses. univariate regression analysis involved calculation of coefficient of determination ( $R^2$ ), Analysis of Variances (ANOVA) and regression coefficients

**Table 4: Model summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate
.733 <sup>a</sup>	0.5373	0.5124	0.7343

**a. Predictors: (Constant), Reverse transportation**

In table 4, the overall correlation coefficient (R) between independent variables reverses logistics and performance of importation distribution firms was 0.733. This means that there was a strong positive relationship reverse logistics and performance of importation distribution firms Furthermore; it indicates that the model explains only 53.7 % of the variations in performance of importation distribution firms as shown by adjusted  $R^2$  of 0.537. Hence, 42.3% Variations is explained by other factors not included in the model.

**Table 5: Summary of ANOVA Results**

Source of difference	Sum of squares	Df	Mean square	F	Sig.
Between groups	14.027	3	4.67567	8.67197	0.005
Within groups	42.055	78	0.53917		
Total	56.082	82			

According to table 5, the overall significance of model was 0.005 with an f value of 8.67197. The level of significance was lower than 0.05 and this means that reverse transportation shows statistically significant influence on Performance of imported furniture distributing firms in Nairobi County.

**Table 6: Analysis of Variance**

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	f	Sig.
	B	Error	Beta		
(Constant)	-4.811	9.033		-3.743	.001
Reverse Transportation	1.168	.300	.576	3.896	.000

a. **Dependent variable:** Performance of imported furniture distributing firms in Nairobi County

b. **Predictors:** (Constant), Reverse Transportation.

Table 6 further, shows the coefficients of independent variables (reverse transportation) the values of  $\beta$  and values of  $t$ . The model was thus estimated as shown in equation (2).

$$Y = - 4.811 + 1.168 X \dots\dots\dots (2)$$

The results in Table 6 indicate that performance of imported furniture distributing firms in Nairobi County was majorly affected by Reverse Transportation ( $\beta = 0.576$ ;  $p \leq 0.05$ ). The beta value for these variables respectively indicates that the dependent variable would change by a corresponding number of standard deviations when the respective independent variables change by one standard deviation. Therefore, it is evident that Reverse Transportation had significant effects on performance of imported furniture distributing firms in Nairobi County as per the model. This, therefore, led to the rejection of all the null hypotheses.

#### 4.7 Hypothesis Tests:

**H01: There is no statistically significant relationship between reverse transportation and performance of imported furniture distributing firms in Nairobi County.** The simple regression analysis in Table 6 indicates that a significant relationship exists ( $\beta_1 = 1.168$ ;  $p \leq 0.05$ ). As a result, the null hypothesis was rejected. This implies that the way things were at the moment, the transport systems of the firms could not meaningfully support the reversal of rejected goods as the distribution circuits were not close-looped.

### V. CONCLUSION

#### 5.1 Conclusion:

The study sought to establish the effect of reverse logistics

In relation to the objective of this study it was established that reverse transportation significantly affected the performance of imported furniture distributing firms in Nairobi County. Most of the furniture distribution firms had forward-looking supply systems and as such did not anticipate back-flow of items. Most of them arranged their distribution networks within the County and seldom dealt with reverse logistics of their products unless they were special cases as they felt these were costly to transport. The firms also did not engage third party retrieval contractors mainly because such firms were few and were deemed expensive. In line with the study findings above the following recommendations are made; The management of the firms need to make provision for product retrievals in their distribution cycles. This is meant to facilitate the transportation of the rejected goods within their circuits. It will also be important if the firms inform their customers in advance so as to ensure they emplace the rejected furniture in the designated area during the reverse distribution cycles. Where possible, the firms should also contract third parties to assist with product retrievals.

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