

## Reverse logistics and performance of food and beverage manufacturing firms in Kenya

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**Abstract:** *Purpose:* This study aimed to determine the relationship between Reverse Logistics and the performance of food and beverage manufacturing firms in Kenya. *Methodology:* An explanatory research design was employed in the study. All 172 of Kenya's registered food and manufacturing businesses were considered using the census approach. Using questionnaires, primary data was gathered. This study employed 172 questionnaires. Version 25 of the SPSS statistical program was used to analyze the data. *Findings:* The study found that there is a correlation of 0.705 between Reverse Logistics and the performance of Kenyan food and beverage manufacturing companies. Reverse Logistics accounted for 49.4% of the variation in the performance of food and beverage manufacturing firms in Kenya. *A unique contribution to theory, practice, and policy:* The Stakeholders theory was validated. The study noted that the use of packaging that is returnable may save costs for the firms and improve efficiency. Reverse logistics can help a company identify ways to reuse, resell or recycle materials that would otherwise end up in a landfill. Implementing reverse logistics not only helps in profit margins but also helps improve the company's brand reputation.

**Keywords:** reverse logistics, agile logistics, reusable products, recycling

## 1. Introduction

Reverse logistics involves the management of the recovery of products once they are no longer desired or can no longer be used by consumers to obtain an economic return through reuse, remanufacturing or recycling (Rubio, 2017). Various countries, such as the United Arab Emirates (UAE), use diverse policies to drive Green Supply Chain Management, although in the public sector, they can range from single-aspect guidelines or policies to more comprehensive action plans. The UAE has consistently embarked on enhancing the sustainability of its economy over the past few years

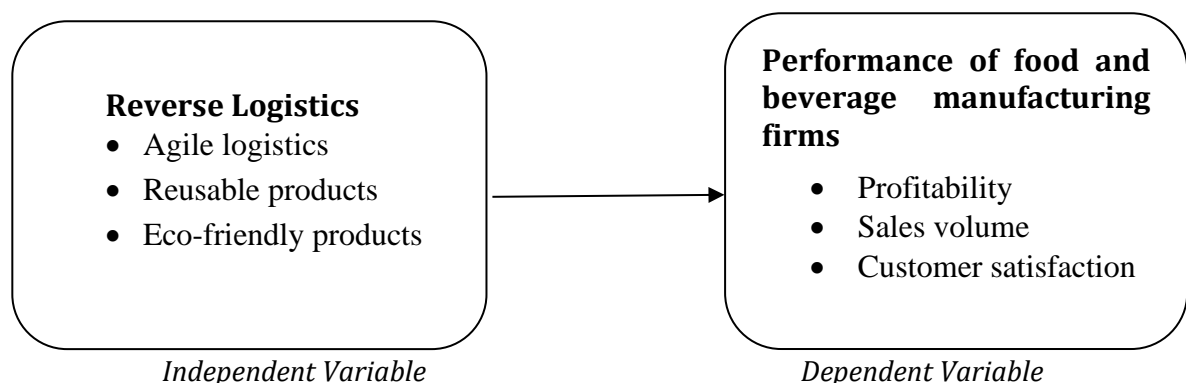


(Vcantugakkas & Yapin, 2017). Returns management is an expensive exercise for organizations. It is brought about by-products that are expired, recalled, damaged while packaging or delivered incorrectly (Sameer, 2009; Martin, 2007). Returns handling can be assessed in volumes to indicate the operation's size. According to Sameer (2009), returned products can be handled up to four times while adding no value to the customer but significant cost to the supply chain. Reverse logistics programs help firms to manage product end-of-life and investment recovery processes. Recovery efforts represent strategic resources requiring complex coordination efforts with upstream and downstream supply chain partners (Kirchoff, 2016).

## 2. Literature review

Harrison and Freeman (2009) defined the concept of a stakeholder approach in relation to reverse logistics management to include any individual or group who can influence the organization's performance or who is affected by the achievement of the organization's goals and objectives. The stakeholder theory is grouped into two: strategic stakeholder, which emphasizes the active management of stakeholder interests and moral stakeholder interested in balancing stakeholder interests (Frooman, 2009). There have been a number of studies on performance and reverse logistics. Muttimos (2014) examined how reverse logistics practices affect company performance in Kenyan manufacturing companies. A model of ten Kenyan manufacturing companies was incorporated into the survey research design of the study. The report claims that recycling, reuse, and returns significantly impact a company's performance. A study by Kabergey and Richu (2015) looked specifically at sisal processing businesses in Nakuru County, Kenya, to see how reverse logistics affected operational performance. The study found a positive correlation between operational performance and reverse logistics. The study suggested Reverse logistics as a way for businesses to gain a competitive advantage.

**Figure 1: Conceptual framework**



## 3. Methodology of the study

The study used an explanatory research design. The census method was used to consider all 172 registered food and manufacturing firms in Kenya. Primary data was collected using questionnaires. A total of 172 questionnaires were used in this study. The data was analyzed using the SPSS statistical package Version 25. The primary data was analyzed using descriptive and inferential statistical analysis techniques. Inferential statistics were used to test and validate the hypothesized relationships between Reverse Logistics and the performance of food and beverage manufacturing firms in Kenya.

## 4. Results and discussions

### 4.1. Descriptive statistics of reverse logistics

The respondents were asked to rate their agreement with the comments made in the reverse logistics section regarding the performance of Kenyan food and beverage manufacturing companies.

The majority of survey participants felt that the organization had successfully integrated manufacturing, transportation, and information flow to fulfil consumer expectations, with a mean of 4.592 and a standard deviation of 0.726. This shows that the responses were reasonably varied. The responses' wide range and a mean of 4.479 with a standard deviation of 0.722 suggest that the business creates recyclable products. The responses showed that the majority of respondents concurred that the company encourages suppliers to utilize returnable packaging materials, with a mean of 4.380 and a standard deviation of 0.823. This suggests that there was a wide range of replies.

With a mean of 3.474 and a standard deviation of 1.072, the responses showed that only a small number of businesses work with suppliers whose products can be recycled, indicating that the results were highly variable. With a mean of 3.523 and a standard deviation of 1.014, the respondents only slightly agreed that businesses package their items on returnable packaging materials. Finally, with a mean of 4.458 and a standard deviation of 0.721, the respondents agreed with the assertion that the organization is able to increase its performance by applying reverse logistics. The average mean of all the statements was 4.151, indicating that most respondents agreed that a relationship exists between reverse logistics and the performance of food and beverage manufacturing firms in Kenya. However, there was variation in the responses, as shown by a standard deviation of 0.846.

The research reveals that Kenya's food and beverage manufacturing companies have often used reverse logistics. The average mean of the responses provided supports this. The results are compared to those by Mutuku (2020), who asked the respondents to give their opinions on how product returns management affected the performance of Kenyan companies that manufacture food and beverages. According to the findings, most respondents agreed with the comments.

**Table 4.1: Reverse logistics**

Reverse logistics	SD %	D %	N %	A %	SA %	Mean	Std. Deviation
The firm has integrated manufacturing, transportation and flow of information to effectively respond to customer's requirements	1	2	10	28	101	4.592	0.726
Firm designs products that can be recycled	2	0	10	47	83	4.479	0.722
The firm encourages suppliers to use Returnable packaging materials.	0	6	13	38	76	4.380	0.823
The firm engages suppliers whose products can be recycled	3	31	24	61	21	3.474	1.072
Firm packages its products on returnable packaging materials	0	29	20	56	19	3.523	1.014
By implementing reverse logistics, the firm is able to improve its performance	0	4	10	45	83	4.458	0.721

The respondents were asked to list any other reverse logistics recommendations that could help Kenyan food and beverage manufacturing companies perform better. They noted that the use of packaging that is returnable may save costs for the firms and improve efficiency. Reverse logistics can help a company identify ways to reuse, resell or recycle materials that would otherwise end up in a landfill. Implementing reverse logistics not only helps in profit margins but also helps improve the company's brand reputation.

## 4.2. Influence of reverse logistics on the performance of food and beverage manufacturing firms in Kenya

The fourth specific objective of this study was to analyze the relationship between reverse logistics and the performance of food and beverage manufacturing firms in Kenya. The hypothesis to test for this specific objective was:

**H<sub>04</sub>:** Reverse logistics has no significant relationship with the performance of food and beverage manufacturing firms in Kenya.

According to Table 4.2's R Square value of 0.497, the predictor variable Reverse logistics may account for about 49.7% of the variation in the performance of Kenyan companies that manufacture food and beverages. The modified R Square value of .494 shows that the predictor variable(s) may

account for roughly 49.4% of the variance in the performance of the dependent variable of food and beverage manufacturing enterprises in Kenya. The R Square and adjusted R Square values suggest that the predictor variable Reverse Logistics explains a substantial portion of the variance in the dependent variable performance of food and beverage manufacturing firms in Kenya.

**Table 4.2: Regression model summary of reverse logistics on the performance of food and beverage manufacturing firms in Kenya**

Model Summary				
Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.075 <sup>a</sup>	.497	.494	.58393

a. Predictors: (Constant), Reverse Logistics

## 5. Conclusions and recommendations

### 5.1. Conclusions

The study noted that the firm has integrated manufacturing, transportation, and flow of information to respond to customers' requirements effectively. The products produced by food and Beverage manufacturing firms are recyclable. Firms encourage suppliers to use returnable packaging materials. From the analysis, not all food and beverage manufacturing firms engage suppliers whose products can be recycled. It was also noted that not all firms package their products on returnable packaging materials. Generally, from the study, it was noted that implementing reverse logistics improves a firm's performance.

### 5.2. Recommendations

The study findings noted that not all food and beverage manufacturing firms package their products on returnable packaging materials. The study, therefore, recommends that firms use returnable packaging materials such as pallets or crates to reduce packaging waste and associated costs. Returnable packaging can be used multiple times before being returned to the supplier for reuse. This practice minimizes the need for disposable packaging, enhances supply chain efficiency, and reduces the environmental impact of packaging materials.

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### Conflicts of Interest

The authors declare no conflict of interest.

### Data availability

Some or all data and models that support the findings of this study are available from the corresponding author upon reasonable request.

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