



## **REVERSE LOGISTICS AND PERFORMANCE OF FOOTWEAR MANUFACTURING FIRMS IN KENYA**

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**Abstract:** The use of reverse logistics improves the corporate image and environmental performance, which in turn leads to a firms' competitive advantage. However, in the wake of increasing environmental pollution and climate change, the use of reverse logistics in footwear manufacturing firms remains low. The performance of footwear manufacturing firms in Kenya has been declining over the years. The objective was to assess effect of reverse logistics on performance of footwear manufacturing firms in Kenya. This study made use of cross-sectional study design. The unit of analysis was all the 16 footwear manufacturing firms in Kenya. The unit of observation comprised of the managers in four departments, which include marketing, procurement/supply chain, operations and store in footwear manufacturing firms in Kenya. The target population was 64 marketing, procurement/supply chain, operations and store managers in the 16 footwear manufacturing firms in Kenya. The study used a census approach and hence involved the entire target population of 16 footwear manufacturing firms with 4 respondents from each firm. The study made use of primary data. Primary data was collected by use of semi-structured questionnaires comprising of closed ended and open ended questions. Qualitative data was analyzed using thematic analysis. The questionnaires generated quantitative data. Inferential and descriptive statistics were used for quantitative data analysis with the help of SPSS version 25 statistical software. Descriptive statistics included frequency distribution, percentages, standard deviation and mean. Inferential statistics included regression and correlation analysis. The study findings were displayed in figures (bar charts and pie charts) and tables. The study found that reverse logistics has a positive and significant effect on the performance of footwear manufacturing firms in Kenya. This study recommends that the management should adopt reusable packaging, recycling, repackaging and product return to help in lowering material costs hence improving profit and the performance of the firm. Moreover, reverse logistics adds value, reduces risk and ensures a continuous movement of goods.

**Key Words:** Organizational Performance, Reverse logistics, Manufacturing Firms

### **Introduction**

Organizations, currently, exists and operate in a turbulent and competitive business environment described by increasing globalization as well as the ever-changing needs and demands of the customers (Younis, Sundarakani & Vel, 2016). To achieve a competitive advantage, organizations are required to integrate environmental thinking into their supply chain management reverse logistics. Green supply chain management aims to include environmental criteria into decision-making at every stage of supply chain, from material management through consumer disposal and the closing the loop notion of reverse logistics (Mosbei, 2021). In both developing and developed countries, firms have been focusing on combining and improving their green practices so as to improve their corporate image and environmental performance. Corporate image assists in reinforcing, generating and maintaining a competitive advantage as well as improving organizational acceptance and stakeholder's approval (Machogu, 2019).

Reverse logistics refers to all operations related to the reuse of products and materials. It can include all recycling, reclamation of raw materials, refurbishment, and reselling of items that have been restocked (Sarhaye & Marendi, 2017). The importance of reverse logistics is to ensure a continuous movement of goods. The strategy reduces costs, adds value, reduces risk, and brings the product life cycle to a close. It also involves repairing, changing, or reusing items that have reached the end of their useful lives. It helps manufacturers recoup assets by helping them to extract more value as possible from their products, leading in a second return on their investment (Omwenga, 2019). The components of reverse logistics include reusable packaging, recycling, repackaging and product return. Reusable packaging is both environmentally and economically beneficial. Companies can save money on raw materials, energy, and labor by decreasing the need to make single-use packaging. Recycling is the act of gathering and processing items that would otherwise be thrown away as rubbish and them into new products (Omusebe, 2018). A product return is when a customer returns previously purchased products to a merchant and receives a refund in original mode of payment, an exchange for diverse or similar item, or a store credit.

Despite its importance in improving the competitive advantage of firms, the execution of reverse logistics, as a component of green supply chain management practices, in manufacturing firms around the world remains low. Consequently, the majority of Kenya's manufacturing firms are characterized by inefficiency in the production process (Wyawahare & Udawatta, 2021). Chelangat (2017) observed that only 21% of all manufacturing firms have fully implemented reverse logistics. Successful execution of reverse logistics improves economic and environmental performance as well as organizational performance. By minimizing environmental expenses while assuring environmentally friendly operations, reverse logistics enable businesses to meet financial and market share goals (Omusebe, 2018).

In the manufacturing sector in Pakistan, Akhtar (2019) found that reverse logistics' initiatives influence firm competitiveness as well as economic performance significantly. In Sri Lanka, Priyashani and Gunarathne (2021) found significant positive association between GSCM strategies like reverse logistics and organizational performance existence. In the United Kingdom, Cousins, Lawson, Petersen and Fugate (2019) revealed that reverse logistics has been linked to better environmental and operational cost performance. In addition, Ojo, Mbohwa and Akinlabi (2019) discovered that reverse logistics positively influence organizational performance in South Africa. In Ghana, Anane (2020) reverse logistics led to enhanced organizational performance. According to Ochieng (2019), reverse logistics have a significant positive impact on large chemical manufacturing companies' performance in Kenya.

### **Statement of the Problem**

Reverse logistics, as a component of green supply chain management, plays a key role in minimizing or eliminating wastages, reducing carbon emissions and reducing energy use (Wyawahare & Udawatta, 2021). In addition, Younis, Vel and Sundarakani (2016), observed that the use of diverse reverse logistics leads to an improvement in corporate image and environmental performance which in turn lead to a firms' competitive advantage. However, in the wake of increasing environmental pollution and climate change, the implementation of reverse logistics in footwear manufacturing firms remains low (Otieno, 2016).

The performance of footwear manufacturing firms in Kenya has been declining over the years. Makori, Datche and Nondi (2019) observed that 75% of state owned manufacturing firms wrongly exposed or dumped posing a threat to humans and the environment. In addition, only 39% of state owned manufacturing firms had conducted training on green supply chain management like reverse logistics amongst their staff. It is therefore essential to assess whether reverse logistics influence the performance of state owned manufacturing firms. In Kenya, some of the state owned manufacturing

firms have been declared bankrupt and others are in the resultant state of receivership (Wanyeri & Moronge, 2018).

The footwear manufacturing firms in Kenya have been performing poorly over the years. Specifically, the footwear manufacturing firms are losing up to 4 per cent sales annually from inefficient execution of critical day-to-day processes (KAM, 2021). Additionally, between the year 2018 and 2019, the profitability of footwear manufacturing firms decreased by 12.15%, which decreased again in 2020 by 3.5% and 6.6% in 2021. According to the Kenya Association of Manufacturers (2021) report, footwear manufacturing firms were under-stocked and there was a decline in stock levels between 2019 and 2020 by 14%. In addition, footwear manufacturing firms risks losing its market shares, leaving Kenya with an option imports and heavy job losses (Nyanumba & Ndeto, 2021). As a result, footwear distributors in Kenya have been importing shoes preferably from China, Turkey and India among other countries. Further, footwear manufacturing firms have been experiencing stock outs in their raw materials including raw leather. Therefore, the performance of footwear manufacturing firms remains poor even after the adoption of reverse logistics.

Studies conducted on implementation of reverse logistics in Kenya have been limited to specific manufacturing firms in Kenya. For instance, Sarhaye and Marendi (2017) assessed the impact of reverse logistics on the organizational performance of Coca-Cola; Omwenga (2019) assessed the effect of reverse logistics techniques on the effectiveness of selected plastic packaging companies within Nairobi County; and Kabergey and Richu (2019) investigated the impact of reverse logistics on the operational efficiency of sisal processing companies in Nakuru County. Firms in different sectors use different production processes and target different markets and hence the use of reverse logistics may vary from one sector to another. Therefore, the researcher sought to examine the effect of reverse logistics on the performance of footwear manufacturing firms in Kenya.

## **Literature Review**

### **Theoretical Review**

Theoretical framework includes explanations of diverse theories and ways in which they relate to variables being investigated (Babbie, 2017). The theoretical framework introduces and explains theories that explain research problem being investigated. This study was anchored on institutional theory. Institutional Theory was developed in 1977 by Brian Rowan and John Wilfred Meyer. According to the theory, organizations are able to enhance their performance by better coordination and control of tasks. The process of institutionalization is characterized by the use of rules in the social processes, actualities, obligations and also in thought and actions. According to Scott (2018), the processes by which institutions, procedures, standards, and norms become established as parameters for acceptable behavior are the subject of institutional theory. This theory's assumptions are based on the fact that the center of an organization world both internal and external is based on things that are well understood and visible to the organization's members. This means that the management although they are affected by given social norms also look at the world in a given dimension and behave according to this perception. This leads them to creating an organizational environment that is based on this perception (Cai & Mehari, 2015).

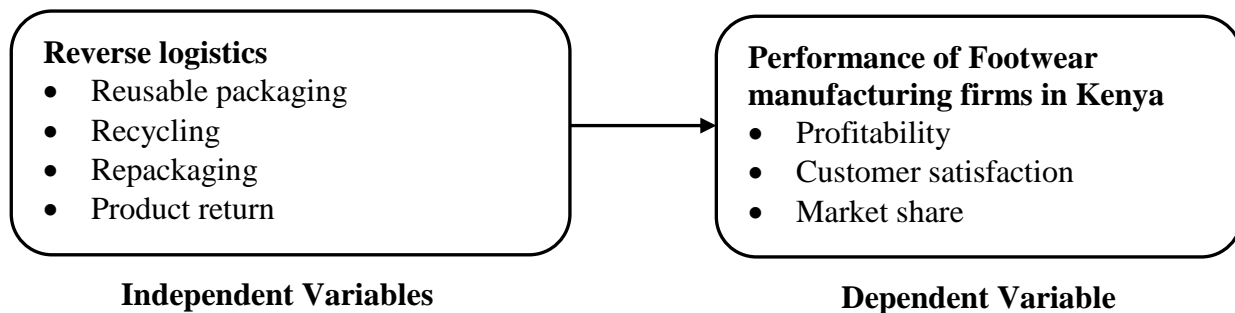
Organizations are not lone rangers that aim to get the best of the economic opportunities available, they are based on social norms and expectations that are part of the things management have to consider before making decisions that relate to the firm. The social norms give a basis through which the interpretations of social happenings are given and provide a means through which people behave and have their purposes (Sahin & Mert, 2022). The social rules become part of the organization's through other mediums such as consultants, states, media, analysts, professional bodies and agencies among other carriers of beliefs and ideas that point at the most appropriate behavior for firm

management. When firms act according to the social norms, they get approval, public endorsement and support which increases their popularity and legitimacy.

This study adopted the institution theory to assess effect of reverse logistics on organizational performance. Foot wear manufacturing firms have institutionalized reverse logistics practices like reusable packaging, recycling, repackaging and product return because of internal and external pressures (Sahin & Mert, 2022). Companies also institutionalize reverse logistics strategies to avoid losing market share to other competitors and to avoid negative implications of noncompliance with environmental mandates (Cai & Mehari, 2015). This is in addition to rising customer and environmental organization demand for ecologically friendly products. As a result of these demands and barriers, businesses are forced to consider environmental influence of their operations. Three institutional strategies may affect managerial decisions to implement environmental management initiatives: normative, coercive, and mimetic. Organizations are obliged to conform due to normative pressures, such as consumer expectations, in order to be viewed as more legitimate. Depending on their influence, a variety of external stakeholders can exert coercive pressure on businesses. Environmental regulations imposed by government entities, for example, may influence the adoption of environmental policies by businesses.

### Conceptual Framework

Figure 1 is a diagrammatic representation of the hypothesized relationships between study variable. Independent variable was reverse logistics. Dependent variable was the performance of footwear manufacturing firms in Kenya.



**Figure 1: Conceptual Framework**

### Empirical Review

All operations involving reuse of materials and products are referred to as reverse logistics. This entails recycling, raw material reclamation, refurbishment, and remarketing of restocked items (Nyarega, 2017). The importance of reverse logistics is that it ensures a continuous movement of goods. The strategy reduces costs, adds value, reduces risk, and completes the product life cycle. Mutangili (2019) looked at the impact of reverse logistics in SC leadership and management on parastatal performance in Kenya, using Kenya Pipeline and Kenya Airways as examples. Desk study review methodology was used in the research. To identify the paper's major topic concepts, a comprehensive examination of empirical literature was done.

Sarhaye and Marendi (2017) assessed the impact of reverse logistics on Coca-Cola Kenya's organizational performance and the impact of supplier assessment on Coca-Cola Kenya's organizational performance. The research was conducted using descriptive research approach. A total of 642 people were surveyed, representing all levels of Coca-Cola employees. The researchers utilized stratified random sampling in their research. The 64 personnel were used in the study. Questions utilized in the study were open-ended as well as closed-ended. Statistical analysis was

employed to examine qualitative data using SPSS version 23. According to the study, there exists a link between RL and Coca-Cola Company organizational performance.

In Kenya, Nyarega (2017) studied the impact of RL on government owned manufacturing firms' performance. Additionally, the researcher used descriptive research approach, with each of 14 government-owned industrial companies constituting the sample frame. The main research instrument was a questionnaire, which was dropped three times and later retrieved from the businesses. The research revealed that Kenyan government-owned industrial enterprises had used significant reverse logistics strategies. It was discovered that higher use of reuse, remanufacture, and recycling reverse logistics practices was linked to increased manufacturing company organizational performance.

In Nairobi County, Samson (2018) investigated whether reverse SC logistics influences the imported furniture distribution enterprises' performance. This study used a descriptive research approach with 130 managers from twenty six Imported Furniture Distributing companies as participants. To generate sample size of 83 respondents for this investigation, a simple random sampling method was used. Secondary and primary data were employed in this research. Primary data was obtained from employees via questionnaires, whereas secondary data was gathered from companies' inventory records. The study established that reverse transportation, reverse storage constraints and reverse inventories management all influenced the performance of companies that distribute imported furniture significantly.

In Kenya, Omwenga (2019) assessed the effect of RL techniques on the effectiveness of selected plastic packaging companies within Nairobi County. Descriptive research approach was employed during the study. The study population composed 180 managers as well as assistant managers from the major departments of all 22 companies involved in sale and manufacture of plastic packaging. The study deployed primary data gathered using self-structured questionnaire. Reverse logistics procedures influences the overall performance of plastic packaging manufacturing companies significantly, according to the study. According to the study, standardized and effective reverse logistics can provide a company with competitive edge and perhaps capture more market share due to their superior method and ability to meet their customers' constantly-changing demands.

Mbovu and Mburu (2018) conducted research to determine the impact of RL methods on improving competitiveness in Kenyan industrial companies. The study included 240 employees from East Africa Breweries Limited's logistics, procurement, and finance departments. The raw data was collected from respondents through a questionnaire. Simple random was used, and primary data was gathered by employing questionnaires. To reinforce the primary data, secondary data from journals, reports, periodicals and magazines was gathered. The researcher found that manufacturing firms' competitiveness is influenced by reverse logistics practices measured in terms of remanufacturing practices, repackaging practices and recycling practices.

Kaberger and Richu (2019) investigated the impact of reverse logistics on the operational efficiency of sisal processing companies in Nakuru County using a correlational research design and cross sectional survey. Employees from all sisal processing companies in Nakuru County were the study's population. Employees in production, accounting and finance, procurement and marketing departments were chosen using purposeful sampling while the sample for the study was determined using stratified random sampling. Structured questionnaire with a 5-point likert scale was used to collect data, which was then analyzed using SPSS version 21. According to the findings, both product recovery and product reuse have a positive impact on the operational performance of sisal processing companies.

## **Research Methodology**

This study adopted a cross-sectional study design. The unit of analysis will be all footwear manufacturing firms in Kenya. According to Kenya Association of Manufacturers (2021), there are 16

footwear manufacturing firms in Kenya. The unit of observation comprised of the managers in four departments, which include marketing, procurement/supply chain, operations and store in footwear manufacturing firms in Kenya. The departments were used in this study because they are involved in the implementation of reverse logistics and in the supply chain of their organizations. The study used a census approach and hence the entire target population of 16 footwear manufacturing firms with 4 respondents from each firm was involved. The respondents in each firm included managers in marketing, procurement/supply chain, operations and store departments.

The study used primary data, which was collected by use of semi-structured questionnaires. Closed ended questions and were in form of a Likert scale as well as nominal scale. The study variables were then measured using five-point Likert scale. The study also used open-ended questions to collect qualitative data. Open ended questions obtained information that was used to explain the quantitative results. A pilot test was conducted in two footwear manufacturing firms with 8 respondents. The pilot test group in this study was chosen at random and comprised of 10 percent of total population. Babbie (2017) suggests that a sample size should be 10% of the total sample size required for a full study. The content validity of the questionnaire was enhanced by structuring questions as per study's indicators and objectives. Face validity was enhanced by employing experts' reviews in procurement and supply chain management field including the supervisor. Construct validity was found to be above 0.7 and hence the research instrument was valid. In addition, the research instrument was found to be reliable.

The questionnaires generated quantitative and qualitative data. This study analyzed qualitative data by employing thematic analysis. The findings were displayed in form of narrative. Inferential as well as descriptive statistics were employed in quantitative data analysis with the help of SPSS version 25 statistical software. Descriptive statistics included percentages, frequency distribution, standard deviation and mean. Additionally, inferential statistics in this study included regression and correlation analysis. The findings were displayed in figures (bar charts and pie charts) and tables. The researcher used 95% confidence level and hence the p-value was 0.05. Therefore, associations and relationships with p-value of 0.05 and below were considered significant but associations with p-value of above 0.05 was considered insignificant. Regression model in this study was;

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Whereby; Y = Performance of footwear manufacturing firms;  $B_0$  = Constant;  $\beta_1$  =Coefficients of determination;  $X_1$  = Reverse Logistics; and  $\varepsilon$  = Error term

### Research Findings and Discussions

The population of this study comprised of 64 marketing, procurement/supply chain, operations and store managers in the 16 footwear manufacturing firms in Kenya. The researcher distributed 64 questionnaires to the respondents. Out of 64 questionnaires that were distributed to the respondents, 58 questionnaires were dully filled and returned to the researcher hence providing a response rate of 90.63%. Babbie (2017) suggests that 75 percent response rate is adequate for data analysis, drawing conclusions as well as making recommendation. This denotes that 90.63% response rate was adequate for data analysis.

**Table 1: Questionnaires' Response Rate**

The unit of observation	Sample Size	Responses	Percent
Marketing Managers	17	15	88.24
Procurement/supply chain Managers	13	12	92.31
Operations Managers	16	14	87.50
Store managers	18	17	94.44
<b>Total</b>	<b>64</b>	<b>58</b>	<b>90.63</b>

## General Information of the Respondents

The general information of the respondents comprised of their highest level of education and the duration of working in the present position. The findings were as shown in Table 2. In relation to the respondents' highest level of education, 53.4% (31) of the respondents pointed out that they had undergraduate degree as their highest level of education, 22.4% (13) had diploma, 19% (11) had masters and 5.2% (3) had PhD. This means that the respondents had undergraduate degree as their highest level of education and hence were literate enough to provide relevant information on reverse logistics and performance of footwear manufacturing firms.

In regard to the duration in which the respondents had been working in the present position, 55.2% (32) of the respondents revealed that they have been working in the present position for between 11 and 20 years, 24.1% (14) indicated for between 5 and 10 years, 12.1 % (7) indicated for more than 20 years and 8.6% (5) indicated for less than 5 years. This implies that most of the respondents had been working in the present position for more than 11 and therefore they had adequate information on reverse logistics and performance of footwear manufacturing firms.

**Table 2: General Information of the Respondents**

Highest level of education	Frequency	Percent
Undergraduate Degree	31	53.4
Diploma	13	22.4
Masters	11	19
PhD	3	5.2
<b>Duration of working in the present position</b>		
Between 11 and 20 years	32	55.2
Between 5 and 10 years	14	24.1
Above 20 years	7	12.1
Below 5 years	5	8.6

## Descriptive Statistics

This section covered descriptive statistics on reverse logistics and the performance of footwear manufacturing firms in Kenya. The closed ended questions were measured on a 5-point Likert scale, with SD representing strongly disagree D representing disagree, N representing neutral, A representing agree and SA representing strongly agree.

### Reverse Logistics

The respondents were asked to specify their level of agreement on various statements regarding reverse logistics in footwear manufacturing firms in Kenya. The findings were as shown in Table 3. The respondents agreed with a mean of 4.30 (SD=0.883) that reusable packaging play a key role in minimizing carbon dioxide emissions. These findings are in line with Sarhaye and Marendi (2017) arguments that reusable packaging can help to reduce carbon dioxide emissions by allowing for more efficient transportation. Moreover, the respondents agreed with mean of 4.069 (SD=0.989) that they are satisfied with the level of reusable packaging practiced in the organization. In addition, the respondents agreed that the organization procure products that are made using recycled materials as shown by a mean of 3.759 (SD=0.823). In addition, the respondents agreed with a mean of 3.655 (SD=0.762) that reusable packaging saves the cost of raw material, energy and labor.

With a mean of 4.310 (SD=0.467), the respondents agreed that repackaging reduces environmental pollution. Moreover, the respondents agreed that recycling prevents pollution and keeps the environment clean as shown by a mean of 3.931 (SD=0.953). These findings are in line with Nyarega (2017) arguments that recycling prevents pollution, helps in keeping the environment clean, reduce

emissions of greenhouse gas and reduces waste that ends up in landfills. The respondents also agreed that the organization has established a recycling system for defective and used products. This is shown by a mean of 3.828 (SD=0.881). In addition, the respondents agreed with a mean of 3.586 (SD=0.899) that the organization use environmental friendly repackaging materials.

The respondents agreed with a mean of 4.035 (SD=0.858) that the organization accepts returns provided customer has receipt as a proof of purchase. These findings conform to Kabergey & Richu (2019) arguments that numerous stores allow returns if consumer has a receipt as proof of purchase and not greater than certain duration of time must have gone since the purchase. In addition, the respondents agreed with a mean of 3.862 (SD=0.868) that they are satisfied with the level of repackaging in the organization. Moreover, the respondents agreed with mean of 3.862 (SD=0.437) that the organization encourage and accept product return. Furthermore, the respondents agreed that the organization does not accept the return of goods after a certain period has passed since the purchase as shown by a mean of 3.724 (SD=1.089).

**Table 3: Aspects of Reverse Logistics**

Statements	Mean	Std. Deviation
Reusable packaging saves the cost of raw material, energy, and labor	3.655	0.762
Reusable packaging play a key role in minimizing carbon dioxide emissions	4.310	0.883
I am satisfied with the level of reusable packaging practised in our organization	4.069	0.989
The organization procure products that are made using recycled materials	3.759	0.823
Recycling prevents pollution and keeps the environment clean	3.931	0.953
Our organization has established a recycling system for defective and used products	3.828	0.881
Our organization use environmental friendly repackaging materials	3.586	0.899
Repackaging reduces environmental pollution.	4.310	0.467
I am satisfied with the level of repackaging in our organization	3.862	0.868
Our organization encourage and accept product return	3.862	0.437
Our organization accepts returns provided customer has receipt as a proof of purchase.	4.035	0.858
Our organization does not accept the return of goods after a certain period has passed since the purchase.	3.724	1.089

The respondents were asked to specify other ways in which reverse logistics is utilized the organization. The respondents noted that the organization use reverse logistics to ensure a continuous movement of goods. The strategy reduces costs, adds value, reduces risk, and brings the product life cycle to a close. In addition, the organization use reverse logistics to repair, change, or reuse items that have reached the end of their useful lives. The respondents further revealed that the organization use reverse logistics to recoup assets by helping to extract more value as possible from their products, leading in a second return on their investment. The respondents noted that the organization use reverse logistics to make sure that abandoned products would not wind up in landfills. The respondents revealed that the organization uses reverse logistics to repack the goods. By repackaging the organization tends to attract the consumer towards its product amongst all the other competitive products in the market.

### **Performance of Footwear Manufacturing Firms**

The dependent variable in this study was performance of footwear manufacturing firms. The respondents were requested to indicate their agreement level on different statements regarding



performance of footwear manufacturing firms in Kenya. With a mean of 4.035 (SD=1.042), the respondents agreed that revenue in the organization has been increasing over the years. Moreover, they agreed that the profitability of the organization has been increasing over the years as shown by a mean of 3.931 (SD=0.876). In addition, the respondents agreed with a mean of 3.931 (SD=1.024) that the market share of the firm has been increasing. Moreover, they agreed that the firm has been experiencing increased customer loyalty as shown by a mean of 3.759 (SD=1.048). In addition, the respondents agreed with a mean of 3.655 (SD=0.890) that the firm has managed to obtain other firms share of the market. Further, the respondents were neutral that the cost of production has been decreasing leading to an increase in profitability as shown by a mean of 3.621 (SD=1.006). With a mean of 3.966 (SD=0.898), the respondents agreed that there has been repeated repurchases from the customers. Moreover, they agreed that the number of customers has been increasing as shown by a mean of 3.862 (SD=0.907). The respondents also agreed that customer satisfaction in the organization has been increasing as shown by a mean of 3.793 (SD=0.894).

**Table 4: Aspects of Performance of Footwear Manufacturing Firms**

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Deviation
The market share of our firm has been increasing	3.4	6.9	13.8	44.8	31.0	3.931	1.024
Our firm has been experiencing increased customer loyalty	6.9	6.9	6.9	62.1	17.2	3.759	1.048
Our firm has managed to obtain other firms share of the market	3.4	10.3	10.3	69.0	6.9	3.655	0.890
The profitability of our organization has been increasing over the years	0.00	10.3	10.3	55.2	24.1	3.931	0.876
The cost of production has been decreasing leading to an increase in profitability	6.9	6.9	13.8	62.1	10.3	3.621	1.006
Revenue in our organization has been increasing over the years	3.4	6.9	10.3	41.4	37.9	4.035	1.042
Customer satisfaction in our organization has been increasing	3.4	10.3	0.00	75.9	10.3	3.793	0.894
There has been repeated repurchases from our customers	0.00	13.8	0.00	62.1	24.1	3.966	0.898
The number of customers has been increasing	3.4	6.9	6.9	65.5	17.2	3.862	0.907

### Inferential Statistics

In this section, inferential statistics such as regression and correlation analysis were used to examine the effect of reverse logistics on the performance of footwear manufacturing firms in Kenya.

### Correlation Analysis

Pearson product-moment correlation coefficient was utilized to assess the strength of association between independent variables (reverse logistics) and dependent variable (performance of footwear manufacturing firms). The findings were as presented in Table 5. The study found a very strong and positive relationship between reverse logistics and the performance of footwear manufacturing firms in Kenya ( $r=0.926$ ,  $p\text{-value}=0.000$ ). The  $p\text{-value}=0.000$  was less than 0.05, thus the relationship was considered to be significant. These findings are in line with Mbovu and Mburu (2018) arguments that manufacturing firms' competitiveness in Kenyan industrial companies is influenced by reverse logistics practices.

**Table 5: Correlation Coefficients**

		Y	X <sub>1</sub>
Pearson Correlation	Y	1.000	.896
	X <sub>1</sub>	.896	1.000
Sig. (1-tailed)	Y	.	.000
	X <sub>1</sub>	.000	.
N	Y	58	58
	X <sub>1</sub>	58	58

**Regression Analysis**

Regression analysis was carried out to examine the relationship between independent variable (reverse logistics) and dependent variable (performance of footwear manufacturing firms). As depicted in Table 6, R-squared for the relationship between green supply chain management practices and performance of footwear manufacturing firms was 0.323 which means that 32.3% of the variation of dependent variable (performance of footwear manufacturing firms) could be explained by independent variables (green purchasing, green distribution, eco-design and reverse logistics).

**Table 6: Model Summary**

R	R Square	Adjusted R Square	Std. Error of Estimate
.568 <sup>a</sup>	0.323	0.308	0.20298

a. Predictors: (Constant), X<sub>1</sub>

b. Dependent Variable: Y

In this study, the ANOVA was performed to determine if the model was good fit for the data. As shown in Table 7, the F-calculated was 211.241 and the F-critical from the F-distribution table was 2.55. Because the F-calculated was greater than F-critical and the p-value (0.000) was not more than the significance level (0.05), the model was considered to be a good fit for the data.

**Table 7: ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Regression	23.327	1	23.327	211.241	.000 <sup>a</sup>
Residual	6.184	56	0.1104		
Total	29.511	57			

a. Predictors: (Constant), X<sub>1</sub>

b. Dependent Variable: Y

Regression equation was;

$$Y = -0.595 + 0.727X_2 + \varepsilon$$

The study revealed that reverse logistics has a positive and significant effect on the performance of footwear manufacturing firms in Kenya ( $\beta_2=0.727$ , p-value=0.000). Because the p-value of 0.000 was less than the significant level (0.05), the relationship was considered to be significant. This means that an enhancement in reverse logistics will lead to 0.727 improvement in the performance of footwear manufacturing firms. The findings confirm to those of Nyarega (2017) who found that reverse logistic was linked to increased manufacturing company organizational performance in Kenya.

**Table 8: Regression Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.595	.208		-2.866	.006
X1	.727	.097	.576	7.522	.000

a. Dependent Variable: X1

### Conclusions

The study also concludes that reverse logistics has a positive and significant effect on the performance of footwear manufacturing firms in Kenya. Moreover, the study established that reusable packaging, recycling, repackaging and product return influences the performance of footwear manufacturing firms. This means that improving reverse logistics (reusable packaging, recycling, repackaging and product return) enhances the performance of footwear manufacturing firms.

### Recommendations

The study found that reverse logistics has a positive and significant effect on the performance of footwear manufacturing firms in Kenya. Therefore, this study recommends that the management should adopt reusable packaging, recycling, repackaging and product return to help in lowering material costs hence improving profit and the performance of the firm. Moreover, reverse logistics adds value, reduces risk and ensures a continuous movement of goods.

### Areas for Further Research

The general objective of the study was to assess effect of reverse logistics on the performance of footwear manufacturing firms in Kenya. However, the study focussed on footwear manufacturing firms hence, the findings cannot be applied to other manufacturing firms in Kenya. As a result, this study recommends that more studies should be conducted to determine how reverse logistics influence the performance of other manufacturing firms in Kenya. Furthermore, the study found that reverse logistics can explain 32.3% of the performance of footwear manufacturing firms. As such, more studies should be conducted to examine other factors that influence the performance of footwear manufacturing firms.

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