International Research Journal Of Supply Chain and Logistics Management

Vol 7, Issue 1, pp 12-34, April 8, 2025, © International Research Journal Publishers, ISSN 2710-2742 (online) www.irjp.org

CIRCULAR RETURNS MANAGEMENT AND PERFORMANCE OF MANUFACTURING COMPANIES IN KENYA

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Accepted, April 3rd, 2025

Abstract
This study evaluated the influence of circular returns management on the performance of manufacturing companies in Kenya. The research was guided by the specific objectives: to determine the effect of circular returns management on performance of manufacturing companies in Kenya and to assess the moderating effect of circular supply chain reconfiguration on the relationship between circular returns management and performance of manufacturing companies in Kenya. The theoretical framework was underpinned by Behavioural Reasoning Theory and Strategic choice theory. Employing a cross-sectional survey design, the study targeted 795 manufacturing companies in Kenya, excluding the service sector, as per the 2023 KAM directory. A sample of 266 companies was drawn using Slovin's formula and stratified sampling technique. Data was collected using questionnaires. Quantitative data was analyzed using both descriptive and inferential statistics and with the help of SPSS version 27. Regression analysis were used to show the relationship between the dependent variable and the independent variables and the study employed multiple linear regression analysis to test the hypotheses. Key findings revealed that circular returns management had significant positive effects on company performance and supply chain reconfiguration demonstrated a significant moderating effect on the relationship between circular returns management and company performance. These findings contribute to understanding circular economy principles in the Kenyan manufacturing context and provide valuable insights for practitioners and policymakers in implementing circular supply chain management practices. Thus, the study recommends that manufacturing firms should put into consideration circular returns management practices to improve performance in market share, sales volume and return on investment levels. Future research directions include a longitudinal study to examine the long-term effects of circular returns management practices on manufacturing performance and a comparative study of circular returns management practices across different industries in Kenya to identify sector-specific challenges and opportunities.

Keywords: *Circular Returns Management, Supply Chain Practices, Performance, Manufacturing Companies, Kenya*

INTRODUCTION

The circular economy concept has gained significance both in academia and practice in the recent years due to its numerous benefits which are attributed to an ever-increasing sensitivity towards product recovery. Factors such as extended producer responsibility (EPR), environmental sustainability requirements, brand image, economic benefits and increasing rate of returns fuel the need for circular economic practices (Choudhary, 2022). One of the most challenging aspects in the implementation of a CE is managing product returns from customers and recovering residual value by reprocessing (i.e., through resale, repair, refurbish, remanufacture, cannibalization, recycle, or disposal) of the entire product, or some of its modules, components, and parts (Jabbour et al., 2019).

In Kenya, the industrial set up has greatly evolved ever since independence. The latest developments in the millennium were adoption in the year 2000 of The Africa Growth and Opportunities Act which was to promote export of textiles from Africa to America, the Kenya industrial property institute in the year 2001 which was to grant and enforce property rights and trademarks. The Kenya Investment Authority was also set up in the year 2004 to introduce mandatory investment thresholds and restrictive screening procedures for foreign investments and eventually in year 2008, the Vision 2030 was created to make Kenya globally competitive and prosperous, and its economic pillar pays special attention to manufacturing and proposes important projects in support of the sector (Ngui et al., 2016).

According to The Vision 2030 Delivery Secretariat, Kenya has a national long- term development blueprint that intends to create a prosperous nation that is globally competitive. It aims to transform Kenya into a newly industrializing, middle- income country with high quality life for its citizens, a clean and secure environment by 2030 (Vision2030, 2019). One of the pillars of the vision is the economic pillar which aims to achieve an average economic growth rate of 10 per cent per annum and sustaining the same until 2030 through apart from other sectors, manufacturing (Vision2030, 2019). The role of the manufacturing sector in the vision 2030 is to create employment and wealth through strengthening the capacity and local content of domestically manufactured goods, increase generation and utilization of Research and Development results, raise the share of products in the regional market from 7 percent to 15 percent and lastly to develop niche products for existing and new markets.

There are some Kenyan companies which have adopted the circular economy policy as a means of enhancing performance in their organizations. This is mostly generalized under green processes though it is still rooted under the circular concept of a regenerative system in which resource input and waste, emission and energy leakage are minimized by slowing, closing and narrowing material and energy loops. Mumias Sugar before facing its financial challenges decided to respond to high energy prices in the country by embarking on an innovative green project. According to (Rosebell, 2017), using bagasse- a natural, industrial waste product in the industry, the company can produce biogas which powers their electricity generators. It uses only a third of the electricity it produces and sells the rest to the national grid which hence earns the company revenue as well as carbon credits (Rosebell, 2017).

Additionally, it is good to note that the effectiveness of circular activities remains on the ability of a product to be recycled back into its almost original purpose, but lack of adequate technology and invaluable market conditions are among the issues that are deterring us from achieving circular economy in Kenyan manufacturing companies (KAM, 2023). Regionally, apart from Rwanda which is a member of the African Circular Economy Alliance (ACEA), Kenya is at a forefront of championing sustainability where government and private sector are working to

achieve circular economy through partnerships that seek to reduce plastic waste in the environment through collection and recycling (KAM, 2023) but more undocumented circular activities might be in operation hence this paper aims at defining a set of aspects that are currently being used by manufacturers in circular returns management practices and how they assist in meeting their performance goals.

Statement of the Problem

The manufacturing industry in Kenya has in the recent years faced significant challenges regarding sustainability and efficient resource utilization. As global markets and industries embrace sustainability, the need for more responsible production and consumption practices has become pressing, particularly concerning how manufacturing companies handle product returns in relation to the concept of circular economy principles (Musau, 2021).

Circular returns management has the potential to transform the manufacturing processes, reduce waste and enhance operational efficiency due to its focus on the recovery, recycling and reuse of products and materials in the supply chain. However, despite the promise of a circular economy many manufacturing companies in Kenya continue to struggle with ineffective returns management systems which lead to increased waste, inefficient use of resources and higher costs (Mor et al., 2021).

Manufacturing plays a pivotal role in Kenya's economic development due to its significant contribution to industrial output, employment and export growth. Manufacturing GDP contribution can give indications whether a country is making strides in industrialization. Notwithstanding, the sector's performance over the last 10 years has faced significant challenges, which has seen its contribution to GDP drop significantly from 11.08% recorded in 2011 to 7.8% in 2022. Kenya hopes to reverse this trend through the Manufacturing 20BY30 Vision that seeks to increase the sector's contribution to GDP to 20% by 2030. However, it is good to note that in the recent years the world real GDP growth has slowed down to 2.4% in 2024 from 2.6% in 2023, 3.0% in 2022 and a high of 6.2% in 2021 while the Kenyan real GDP has experienced volatility with a high of 7.8% in 2021 dropping to 4.8% in 2022, staggering to 5.1% in 2023 and 5.3% in 2024 (KAM, 2024) and (KNBS, 2024). All this is affected by various circumstances such as management of returns within the supply chain, particularly in the context of circular economy practices remains under explored in Kenya's manufacturing sector. It is also notable that in the Kenyan context more focus has been on green sustainable practices and their effects on manufacturing performance and the few studies on circular economy approach are based only on waste management for instance (Abong et al., 2021) had studies on green consumerism in Kenya and (Musau, 2021) who studied the effects of green manufacturing in Kenya. The circular returns management practices effects on performance of manufacturing companies are yet to be fully explored in the Kenyan perspective hence this study.

Apart from the sparce information available on the subject, it is not adequate to only consider the technical and engineering performance of manufacturing systems as per the current available information. Perspectives of circular economy of economics, society and ethics ought to be incorporated into the key performance indicators for assessing performance improvements (Byrne et al., 2020). This study seeks to explore the relationship between circular returns management, supply chain integration and sustainability practices and how these factors collectively influence the performance of manufacturing companies in Kenya.

Specific Objectives

i. To determine the effect of circular returns management on performance of manufacturing companies in Kenya.

ii. To assess the moderating effect of circular supply chain reconfiguration on the relationship between circular returns management and performance of manufacturing companies in Kenya.

Study Hypothesis

H01: Circular returns management has no significant effect on the performance of manufacturing companies in Kenya.

H02: Circular supply chain reconfiguration has no significant moderating effect on the relationship between circular returns management and performance of manufacturing companies in Kenya.

Theoretical Review

Behavioural Reasoning Theory (BRT)

Behavioural reasoning theory is the study of why, when and whether consumers will accept an innovation. The theory generally studies the behaviour of the individual at the micro level, pattern of relationships which enable scholars and practitioners to understand adoption of any innovation. It includes different theoretical frameworks for instance diffusion of innovation theory, technology acceptance model, theory of reasoned action and theory of planned behaviour (Padhy et al., 2020). The components of BRT are behavioural intentions, attitude, reasons (both for and against) and values. Behavioural intentions are the tendency of the consumer to engage in a task, action or behaviour while the degree of assessment of the positive or negative outcome of the behaviour is the attitude (Kim et al., 2018). Reasoning takes centre stage in consumer's mental processing behaviour and are major predictors of attitude towards behavioural intention while values which can be understood as abstract cognitions that provide a way for life are thought to be significant in shaping a person's attitude (Dhir et al., 2021).

Considering BRT theorises that individuals' values and beliefs offer the approach and avoidance for their global motive which further influences behavioural intentions while utilising multiple contextual variables used in explaining consumption behaviour. It is hence useful in several management concepts such as circular management and environment friendly products. Self-identity is a suitable choice for the belief or value component of BRT which will influence reason for and reason against adoption of circular management practices, specifically returns management (Kumar et al., 2021).

The adoption of circular returns management concept in the business environment, which will involve closing loops, intensifying loops and dematerialising loops will be adopted or disregarded and will be positively or negatively influenced through the behavioural intentions, attitudes, reasons, and values of all the participants in the streams of supply chain (Dhir et al., 2021). This will involve revamping the traditional linear supply chain structures through implementation of closed loop processes, improving visibility, trust and collaboration across supply chain participants and initiating policies to recap resources (Hazen et al., 2020).

Strategic Choice Theory

Strategic choice is a systemic theory of strategy. According to (Zhu, 2012) the theory is built on an interaction mode where organisations adapt to their environment in a conducive manner that will enable achievement of their goals. It was developed by John Child (1972) and continues to provide a significant influence on the study of organisations and management (Harney, 2016). The variance of environmental conditions, whether the environment was dynamic or static, and organisational contingencies were seen to automatically produce a specific type of organisational response. This contingency approach served the objective of offering insights for what management should do (Harney, 2016).

Strategic choice brings about managerial agency and decision making more directly into the equation. For (Child, 1972), strategic choice was defined as the process whereby power holders in an organisation decide upon courses of strategic action. Managerial discretion is important in making the strategic choice and it ought to be informed by underlying values and belief (Harney, 2016).

Strategic choice being a systematic theory of strategy in this study is built on a notion of interaction between partners in a supply chain which enhances organisations adapt to their environment in a self- regulating manner to achieve their goals and the dynamics over time become stable hence bring about circular economy aspects in the social, economic and environmental aspects of the supply chain partners. The strategic choice decisions determine the future strategy of the firm hence the strengths, weaknesses, threats and opportunities that can be exploited. This in turn determines the performance of the entity. It is therefore a paramount theory in consideration of circular reconfiguration practices which will affect the performance of any organisation while taking into consideration return on investment This is because the Strategic Choice Theory details on the importance of taking the right action in a contradicting situation so as to achieve efficiency as a result of the choices picked.

Conceptual Framework

A conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation. Mugenda and Mugenda (2016) define a conceptual framework as hypothesized model identifying the model under study and the relationship between study variables variables. Figure 2.1 presents the hypothesized relationship between the independent variables, the moderating variable and the dependent variable for testing in this study:

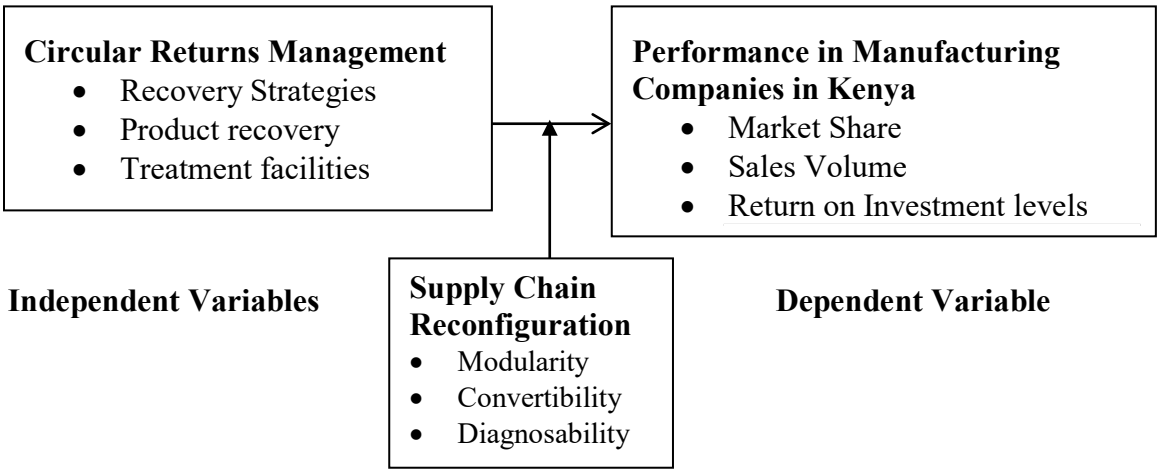

Figure 1: Conceptual Framework

Circular Returns Management

Returns management is a supply chain management concept that involves activities associated with returns, reverse logistics, gate keeping and returns avoidance and how they are managed within companies and additionally across the supply chain involved. The aspect of circular returns management aspect is demonstrated during avoidance of disposal and retaining resource values which in turn supports the resource base and helps in retaining amenity values (Hazen et al., 2020). This requires modification of internal processes regarding changing of the linear

consumption model to support product take back and reverse flows. The businesses involved will be required to re-engineer their roles as suppliers and customers to support multi-directional flows. There is evidence of reverse logistics practices being aligned with CE principles but had not been recognises as such by companies (Bernon et al., 2018).

There is a paucity of research in developing decision making models which may consider life-cycle span of product returns with an aim of selecting an appropriate reprocessing option for value reclamation in circular economy. Developing successful recovery operations and managing the same is of paramount importance to companies due to underlying benefits related to sustainability however challenging the recovery process of the entire product or some of its components or parts may be (Choudhary et al., 2022). A company's circular returns management system is considered efficient and effective if it provides suitable recovery options for returns as early as possible in the supply chain process. It is unfortunate that most recovery strategies are based on cost benefit analysis and not time sensitivity of products. There is hence a need for a comprehensive model to identify appropriate recovery operation by making a tradeoff between multiple attributes and options with time-sensitivity considerations (Choudhary et al., 2022).

Of concern though is the presence of lenient return policies so as to boost sales and overall business goals for instance throughnhassle-free return process experience for customers such as pre-printed return documents accompanying every order or for amounts above certain levels there is free of charge returns. Such policies shape the magnitude of returns and exchanges hence have the ability to impact a company's business goals. This necessitates a need to balance return policy on sales with the return rate (Karlsson, et al., 2023).

It is notable that lack of a circular returns framework leads to pollution. Companies can assist in pollution prevention by developing methods that help to diminish the usage of hazardous and non- hazardous materials and equipment at the end of their life cycle by establishing strong return management strategies. All waste is hazardous to human health and the environment and needs proper treatment to achieve environmental sustainability (Mor et al., 2021). Most developed countries export their electronic wastes to developing countries and this is due to high labour costs incurred to dismantle and recycle e-waste, though to manage these wastes in developing countries, crude methods such as burning and dissolution of items in strong acids are used. There is no effort to protect the environment and human health (Ganguly, 2016). This implies that manufacturing companies ought to have a guide to implementation of returns and waste management policies and decision makers need information about their potential effects on public health (Vantarakis et al., 2016).

Supply Chain Reconfiguration

Reconfigurability is used to measure quantitatively the capability of supply chain to easily change their structure and functions. Given the COVID 19 pandemic, fluctuating demand, market uncertainty and the emergence of new technologies, a more flexible and agile supply chain in response to the market trends is needed. Ensuring supply chain flexibility, agility, resilience, and viability requires the development of a reconfigurable supply chain that can cope with various market changes in the supply chain levels with the minimum resources time and cost (Zidi et al., 2022). To stay responsive to evolving customer demands and to meet the need for greater product customizations, there is need for organizations to quickly reconfigure their manufacturing systems and supply chain. Supply chain reconfiguration is hence applied as a moderating variable as reconfiguration can alter the association between the independent and dependent variables by either strengthening or diminishing the association according to operational circumstances of the organization (Tian & Guo, 2019).

Modularity based manufacturing practices is the application of unit standardisation or substitution principles to create modular components and processes that can be configured into a wide range of end products to meet specific customer needs (Tu et al., 2004). These practices enable firms to achieve modularity in product design, production process design and organisational design which can be achieved when their components can be disaggregated and recombined into new configurations with little loss of functionality. Dividing a complex system into smaller modules and examining each piece separately can ease management in a business and increase benefits such as economies of scale, increased feasibility of product/components change, increased product variety and reduced lead time, ease of product upgrade, maintenance, repair and disposal among others thus implementing a reconfigurable manufacturing system (Omai et al., 2018).

To support these processes, convertibility is incorporated which involves having flexible and changeable dynamics in the manufacturing process which can easily be applied at the equipment, production system and assembly levels to dynamically and efficiently change the capabilities of the system, resources, and new configurations to adopt to the rapidly changing manufacturing environment hence increase and maintain efficient performance in the companies (Zidi et al., 2022).

To detect and correct failures quickly, the reconfigurable supply chain system must have a high degree of diagnosability which can be measured through parameters like detectability, predictability, and distinguishability. Detectability determines the time before detecting the failure, predictability which measures the time before the failure re-occurrence and distinguishability which measures the time necessary to identify the replaceable unit of a system that causes a failure. Bottom line, supply chain reconfiguration aspect of diagnosability is measured by considering two quantitative factors: supply chain visibility and detection time (Zidi et al., 2022).

The Concept of Performance

Performance is defined as the operational excellence to deliver leading customer experience (Trong, 2016). According to (Byrne et al., 2020) performance is to be interpreted in relation to technical efficiencies and capabilities, agility, resilience and robustness of manufacturing companies. For a long time in history, the goals of organisations' existence was making of profits or return on investments but during the more recent years marketplace characteristics have changed as customers are demanding goods and services at a more quicker delivery, higher quality, better price and greater service excellence (Nia et al., 2016) which also leads to increased awareness of the ecological dimension and the social dimensions such as people's fear of losing their jobs due to emerging technologies (Birkel & Müllerb, 2021). Also, apart from economic performance, other stakeholders such as policy makers and non-governmental organisations (NGO)s are also showing interest in the social and environmental performance of companies (Schoggl et al., 2016). To thus achieve synergies in performance, the three interdependent dimensions of triple bottom line (TBL) concept are considered. They include economic, environmental and social aspects of performance (Birkel & Müllerb, 2021).

Sustainable performance of an organisation refers to its ability to meet the needs and expectations of customers and other stakeholders on long-term, balanced by an effective management organisation by organising staff awareness by learning and applying appropriate improvements and innovation which in turn leads to an increase in market share and return on investments of the companies as a consequence of the social and economic aspects and effects of an organisation (Stanciu, Constandache, & Condrea, 2014).

A study was done by (Bendickson & Chandler, 2019) on operational performance: the mediator between human capital developmental programs and financial performance where positive outcomes derived from human capital development programs (HCDP) were investigated. It was theorised that superior HCDP represent competitive advantage that improves operational performance and subsequently leads to positive financial outcomes. The findings supported the hypotheses: better HCDP lead to operational performance, which leads to greater revenue, sales and market share.

Another study was done by (De Oliveira et al., 2019) on innovation and financial performance of companies doing business in Brazil. An analysis on the relationships among innovation efforts, the impacts of these innovations and the financial performance of Brazilian companies was done. The findings indicated that efforts in innovation possibly do generate impacts though the impacts generated do not necessarily imply better financial performance. This hence means that although a firm's efforts may lead to new products, they will not contribute to financial gains in the short term thus reflecting the risks and costly nature of innovation.

In a study by (Aydiner et al., 2019) on information system capabilities and firm performance, the investigation involved interrelationships between information systems (IS) - related capabilities and their effect on firm performance. The results confirmed that decision making performance and business- process performance play a great role in the human resource and administrative related IS capabilities and firm performance relationships. It was however noted that infrastructure has a low effect on IS capabilities and firm performance. (Trong, 2016) also stated that logistics which is the responsibility to design and administer systems to control movement and geographical positioning of raw materials, work-in process, and finished inventories at the lowest total cost, play an important role in pursuing excellence which will lead to improved return on investments thus affecting the overall performance of an entity.

Empirical Review

Circular Returns Management

A study on retail returns management strategy was done to shed light on formulation of returns management strategies and to identify key returns management components in developing more effective returns management strategies. The results confirmed the importance of supply chain alignment in establishing effective strategies for managing product returns and suggest a return policy. The returns process involves the actual returns, avoidance, gatekeeping, reverse logistics and service while the return policy ought to cover aspects of time, cost, effort, scope and exchange for the returns strategy to meet the business goals. The returns strategy is hence a key driver of the company returns management function (Karlsson, et al., 2023).

Another study was conducted by (Bernon et al., 2016) which was concerned with the level of consumer sales being fulfilled through omni-channel retailing and the subsequent impact on the levels of consumer retail returns experienced through online sales and the emergent returns management strategies being affected by retailers in relation to the returns management processes. The study found out that omni channel returns management is yet to fully mature as the return rates for online retailing can be double those for physical stores. The online retailing concept had challenges in network design and returns processes in offering a seamless solution (Bernon et al., 2016).

Another study was conducted by (Zhang et al., 2018) on the overview of the waste hierarchy framework for analysing the circularity in construction and demolition waste management in Europe. As per the study the largest driver of resource consumption and waste generation in Europe is the construction industry hence the evolution of the waste hierarchy in Europe and

how it compares with the circular economy, the practice of construction and demolition waste management is analysed. The findings bring insight into optimising and upgrading the construction and demolition waste management considering advanced technologies and subsequently steering the pathway for transitioning the EU towards a circular society (Zhang et al., 2018).

Supply Chain Reconfiguration

A study was done by (Dolgui et al., 2020) on Reconfigurable supply chain: X-network where it was established that there is lack of integration spanning on supply chain digitalization, resilience, sustainability and agility and more focus on individual frameworks of these major frameworks. It was hypothesized therefore that reconfigurability can be considered such an integral perspective that consolidates the research in supply chain adaptation of ever-changing environments. The study proposed two novel concepts- dynamic SC meta structures and dynamic autonomous services, and proactively made future directions in the reconfigurable SCs. The study can be applied by decision makers to decipher chances and barriers in contemporary SC transformations (Dolgui et al., 2020).

Another study was done by (Biswas, 2017) on modeling reconfigurability in supply chains using total interpretive structural modeling which was meant to identify, analyze, and categorize the major enablers of reconfigurability that can facilitate structural changes within a supply chain in a global scenario. 15 enablers for reconfiguration paradigm were identified through literature review and expert opinions. New product development and customer satisfaction came at the highest level of priority. It had implications for both practitioners and academia as the list of enablers was very comprehensive and relevant to reconfigure supply chains in today's volatile global market (Biswas, 2017).

Another study was done by (Tian & Guo, 2019) concerning reconfiguration of manufacturing supply chains considering outsourcing decisions and supply chain risks where the study proposed a graph based cost model to optimise configuration of manufacturing enterprise with the consideration of operating cost and reconfiguration cost. This is caused by the need to stay responsive to evolving customer demands and to meet the need for greater product customizations. The reconfiguration decisions require a system-level optimization that involves many factors such as manufacturing tasks, outsourcing decisions, supply chain configurations as well as risks (Tian & Guo, 2019).

RESEARCH METHODOLOGY

Research Design

The study applied a cross-sectional research design in analysis. According to (Thomas, 2022) cross-section survey design can be used for both analytical and descriptive purposes in that it can answer how or why a certain outcome might occur and summarize the said outcome using descriptive statistics (Thomas, 2022). The design was applied as it enabled the researcher to generalize the findings to a larger population and focus on the relationship between the independent variables and the dependent variables. The research design helped to describe the existing scenario in the circular supply returns management practices and performance of manufacturing companies and expounded on the relationship between the variables.

This study adopted a positivist research paradigm. Cooper and Schindler (2017) asserts that positivist research paradigm takes the quantitative approach and is based on real facts, objectivity, neutrality, measurement and validity of results. The roots of positivism lie particularly with empiricism, that is, all factual knowledge is based on positive information

gained from observable experiences, and only analytic statements are allowed to known as true through reason alone.

Target Population of the Study

In this study, the target population was manufacturing companies in Kenya. This was to reach the entire Kenyan manufacturing segment to provide up to date information on circular supply chain operations as a country because different regions and sectors contain different information which will be important to capture thus making the results more conclusive in comparison to focus on one region and sector. The 2023 KAM directory has a listing of members by sectors, which contains a register of 14 sectors of those in manufacturing firms spread all over Kenya. The directory categorizes members per sector, which is defined by the services they produce, the type of raw materials they import or the products they manufacture. The population of all the registered members for the 14 sectors, as per the directory, was 1,048. The two service sectors of fresh produce and service and consultancy were eliminated to remain with the 12 manufacturing sectors because their focus is on the provision of services and not the actual manufacture of goods and products.

The 12 manufacturing sectors have a total population of 795 companies, which comprise the unit of analysis while the unit of observation was the organizational management officers conversant with the supply chain process and their assistants. Additionally, the sample size derived from the target population using the Slovin formula for this study was 266 respondents and is shown in Table 1.

Table 1: Classification of the Sample Size

Types of Sectors	**Manufacturing Companies in the sector**	**Sample size**
Building, Mining & Construction	49	16
Chemical & Allied	81	29
Energy, Electrical & Electronics	50	17
Food & Beverages	193	64
Leather & Footwear	17	6
Metal & Allied	87	29
Automotive	56	18
Paper & Board	58	19
Pharmaceutical & Medical Equipment	29	10
Plastics & Rubber	83	27
Textiles & Apparel	62	21
Timber, Wood & Furniture	30	10
Total	**795**	**266**

Note. This table was created by the author of this article.

The stratified sampling method was used to put the population into distinct, independent strata that enable the researcher to draw inferences about specific subgroups that may be lost in a more generalised random sample, thus leading to more efficient statistical estimates (Creswell & Guetterman, 2018).

Data Collection Instrument

Data collection is how information is obtained from the selected subject of an investigation (Mugenda & Mugenda, 2016). The researcher collected primary data during the research. Primary data was collected using a questionnaire covering circular returns management practices and the performance of manufacturing companies in Kenya. The questionnaire

contained closed-ended questions. According to Kothari (2019), questionnaires can be administered in person, mailed to the respondents and distributed electronically. The questionnaires were self-administered to encourage the quick collection of complete responses and clarify any doubts in the filling process.

Pilot Study

A preliminary analysis was conducted to assess the validity and reliability of the research instrument before the main data collection phase of the study. A pilot study was done prior to the actual data collection. The pilot involved thirty (30) participants sampled randomly from different manufacturing companies in the country. 30 questionnaires were sent for the pilot study, and all were successfully completed. Content plus construct validity was used for assessing the data collection instrument for clarity of words, because it is considered more scientific approach than mere content or face validity. Reliability of the research instrument was tested using Cronbach's alpha-a test of internal consistency (Kothari, 2019) where the items had a Cronbach's alpha coefficient of 0.792 confirming reliability because it is above the threshold of 0.7 which suggest that the questionnaire was a valid and reliable tool for measuring the targeted constructs.

Data Analysis

The objectives of the study were analyzed using descriptive statistics techniques and multiple regression models were fitted to the data to determine how the predictor/independent variables affect the response/dependent variable. The equation for circular returns management and the performance of manufacturing companies in Kenya is expressed in the following equation:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \varepsilon}$$

This study used multiple regressions analysis (hierarchical moderated method) to establish the moderating effect of Supply Chain Reconfiguration (Z) on the relationship between circular returns management and performance of manufacturing companies in Kenya. The regression model for the moderating effect was as follows;

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 (X_1 Z) + e}$$

Where:

Y = Performance of manufacturing companies

$\boldsymbol{\beta_0}$= Intercept coefficient or value of dependent variable when the independent variable is zero

$\boldsymbol{\beta_1}$= Coefficient for circular returns management

$\mathbf{X_1}$ = Circular returns management

$\boldsymbol{\beta_2}$= Coefficients for interaction terms between supply chain reconfiguration and circular returns management

Z = Circular supply chain reconfiguration

e = Error term

RESULTS AND DISCUSSION

Out of the 266 questionnaires administered among the respondents, 221 questionnaires were returned completely filled, representing a response rate of 83.1%.

Descriptive Statistics Analysis

In this section, the study presents the finding on the specific objectives of the study. On the likert scale questions, the scale was 5 with 1 Strongly Disagree, 2 Disagree, 3 Moderate, 4 Agreeand 5 Strongly agree. Means and standard deviations were used to interpret the results with a mean of 0-1.4 implied that the respondents strongly disagreed, a mean of 1.4-2.4 implied they disagreed, 2.5-3.4 suggest that they were neutral, a mean of 3.5-4.4 suggest they agreed, and a mean of 4.5-5 implies the respondents strongly agreed (Trochim, 2016).

Circular Returns Management

The construct measured the extent to which an entity engaged in circular returns activities and the 12-item scale assessed circular returns management practices across several areas, including recovery strategies, product recovery and treatment facilities. The overall mean response score was 3.92 (SD = 0.934) or 78.4%. This score falls within the interval range, indicating that respondents agreed that circular supplier sourcing has an impact on the performance of manufacturing companies in Kenya. Therefore, from the participants' perspectives, the companies in the sample had, on average, high engagement in circular returns management practices. The majority of the respondents neither agreed or disagreed at a mean of 3.92 which was almost meeting the agreement threshold of 4. The item that attracted the least number of "agree" or "strongly agree" responses was "Products that have reached the end of life are returned to the company for disposal." Only 68.8% (n = 152) responded positively to this statement. Over 80% of the participants agreed or strongly agreed with nine (9) RM items, and none of the items attained a 90% agreement. In sum, the majority felt that their organisations were highly engaged in most of the assessed circular waste disposal practices. On average, participants rated their organisations to score highly in all but one RM item, which had a moderate score.

The standard deviations in these results indicate the degree of agreement and variability among respondents regarding the impact of circular supplier sourcing on market share, sales volume, and return on investment levels. Lower standard deviations, such as our organisation has invested in air pollution regulators, reduced harmful substances, and vapour recovery systems (SD=0.855) and our organisation has strategies for return of products and waste (SD=0.806), reflect a strong consensus, suggesting these benefits are consistently recognized across the organization. Higher standard deviations, such as for products in the public that have reached end of life are returned to the company for disposal, refurbishment or recycling (SD=1.030) and the production department in our organization prioritizes waste disposal (SD=0.994), suggest less diverse opinions, reflecting lesser differences in individual perceptions or experience and general agreement among the respondents. This implies that the experiences and perceptions are mostly aligned but with minimal differences. The results were as shown in Table 2 below:

Table 2: Circular Returns Management

Circular Returns Management	1	2	3	4	5	N	Mean	S D
Our organisation has strategies for return of products and waste	1	25	10	156	29	221	3.85	0.806
Our organisation adheres to laws and legislation on air pollution	1	23	8	115	74	221	4.08	0.909
Our organisation has invested in air pollution regulators, reduced harmful substances, and vapour recovery systems	2	23	8	144	44	221	3.93	0.855
Our organisation sensitises its employees on pollution	1	25	8	114	73	221	4.05	0.928
The production department in our organisation prioritises waste disposal	1	42	8	126	44	221	3.77	0.994
Our organisation has separate disposal containers for different wastes	1	32	9	138	41	221	3.84	0.908
The waste that has been disposed are reused in production process	2	35	9	130	44	220	3.81	0.964
Our organisation is NEMA compliant	1	22	8	102	88	221	4.15	0.925
Our organisation has treatment facilities for	0	27	12	131	51	221	3.93	0.879

production waste								
The disposal process is compliant with the government regulations	1	24	8	107	80	220	4.10	0.934
Products in the public that have reached end of life are returned to the company for disposal, refurbishment or recycling.	2	47	20	114	38	221	3.63	1.030
Our organisation has an environmental impact assessment system	1	30	12	122	55	220	3.91	0.942
Circular returns management							**3.92**	**0.923**

Key: 1= strongly disagree, 2= disagree, 3 = neither agree nor disagree, 4= agree, 5= strongly agree

Note. This table was created by the author of this article.

Supply Chain Reconfiguration

The second specific objective of the study was to assess the moderating effect of circular supply chain reconfiguration on the relationship between circular supplier sourcing and performance of manufacturing companies in Kenya. The supply chain reconfiguration construct measured SC flexibility or the degree to which manufacturing companies can easily modify their SC structure to meet changing needs (Zidi et al., 2021). A 12-item scale was used for this construct. Areas of focus included modular design, circular inputs and sub-products, circular and efficient conversion, and emergency response. The responses to the SCR items are in Table 3. The overall mean response score was 3.87, with a standard deviation of 0.894. This score falls within the interval range, indicating that respondents agreed that supply chain reconfiguration as a moderating variable has an impact on the performance of manufacturing companies in Kenya.

Over 80% agreed or strongly agreed to all but three SCR items. The item with the least "agree" and "strongly agree" responses was "Circular sub-products and inputs are easy to source" (59.7%, n = 132). Nearly a third (31.2%, n = 69) disagreed that circular sub-products and inputs were easy to source in their organisation, while the remaining 9.05% (n = 20) were undecided. Only this item had less than 75% of the respondents agreeing or strongly agreeing. Hence, the majority of the participants were of the view that their organisations had effective SC reconfiguration practices. Mean scores were computed for the SCR items as specified for the other constructs. Participants' overall mean score in the 12 items was 3.87 (SD = 0.894) or 77.3% and was considered high. In other words, on average, participants neither agreed nor disagreed that the manufacturing companies in this sample are engaged in circular SC reconfiguration practices.

Table 3: Supply Chain Reconfiguration Variables

Supply Chain Reconfiguration	**1**	**2**	**3**	**4**	**5**	**N**	**Mn**	**S D**
Our organisation uses the modular design of creating an item out of smaller, interchangeable parts or modules.	1	34	8	150	28	221	3.77	0.877
Our sub products and input in production leads to specialization	0	31	9	149	32	221	3.82	0.848
Circular sub-products and input in production enhances operations	1	29	13	151	26	220	3.78	0.837
Circular sub-products and input are easy to source	0	69	20	111	21	221	3.38	1.027
Our organisation manages conversion of circular material i.e., biodegradable material without use of toxic chemicals, to finished products	1	44	9	130	37	221	3.71	0.984
Our organisation has invested in machinery and systems that are used in conversion of input to finished	1	23	11	137	49	221	3.95	0.854

products								
Our organisation employs professionals who are knowledgeable of the company's production process	1	26	5	124	65	221	4.02	0.912
The conversion of raw material to finished goods in our organisation is effective	1	25	7	141	47	221	3.94	0.859
Our organisation has a laid down structure for adoption in operation	0	26	6	130	59	221	4.00	0.876
Our organisation can quickly diagnose issues within its supply chain	1	25	7	128	60	221	4.00	0.894
There are monitoring teams tasked with ensuring smooth operation of the company	0	26	6	128	61	221	4.01	0.882
Our organisation is quick in responding to emergency situations	1	24	6	133	57	221	4.00	0.874
Supply Chain Reconfiguration							**3.87**	**0.894**

Key: 1= strongly disagree, 2= disagree, 3 = neither agree nor disagree, 4= agree, 5= strongly agree

Note. This table was created by the author of this article.

From the results, the respondents agreed that organisations use the modular design of creating an item out of smaller, interchangeable parts or modules (M=3.77, SD= 0.877). In addition, the respondents agreed that sub products and input in production leads to specialization (M=3.82, SD= 0.848). The respondents also agreed that circular sub-products and input in production enhances operations (M=3.78, SD= 0.837). Further, the respondents agreed that circular sub-products and input are easy to source (M=3.38, SD= 1.027). The respondents agreed that organisations manage conversion of circular material i.e., biodegradable material without use of toxic chemicals, to finished products (M=3.71, SD=0.984). The respondents also agreed that organisations have invested in machinery and systems that are used in conversion of input to finished products (M=3.95, SD=0.854). In addition, the respondents agreed that organisations employ professionals who are knowledgeable of the company's production process (M=4.02, SD=0.912). Further, the respondents agreed that the conversion of raw material to finished goods in their organisations is effective (M=3.94, SD=0.859). The respondents agreed that organisations have a laid down structure for adoption in operation (M=4.00, SD=0.876). The respondents also agreed that organisation can quickly diagnose issues within its supply chain (M=4.00, SD=0.894), there are monitoring teams tasked with ensuring smooth operation of the company (M=4.01, SD=0.882) and their organisations are quick in responding to emergency situations (M=4.00, SD=0.874).

The standard deviations in the responses reveal the level of consensus among respondents regarding circular supply chain reconfiguration on the relationship between circular supplier sourcing and performance of manufacturing companies in Kenya. The lowest standard deviations, such as for circular sub-products and input in production enhances operations (SD=0.837) and the sub products and input in production leads to specialization (SD=0.848), indicate a strong consensus, suggesting that these aspects are consistently experienced and perceived across the organization. Higher standard deviations, such as for circular sub-products and input are easy to source (SD=1.027) and organisations employ professionals who are knowledgeable of the company's production process (SD=0.912), suggest less diverse opinions, reflecting lesser differences in individual perceptions or experiences.

Manufacturing Performance

The study assessed participants' views of the performances of their organisations using a 12-item instrument. The questionnaire covered various performance aspects, including customer relations, product/service delivery/quality, technology integration, and financial performance. The questionnaire prompted participants to indicate their agreement with each item. Their responses are shown in Table 4. All the 12 items were assessed using positively worded statements. Mean scores were then computed for the items following the procedure outlined previously. The overall mean in the 12 items was 3.82 (SD = 0.911), an equivalent of 76.3%. In other words, on average, participants assigned a rating of 76.3% (high) to their organisations' manufacturing performance.

Table 4: Manufacturing Performance Variable

Manufacturing Performance	1	2	3	4	5	N	Mn	Std D
Our business has improved because of the trust with customers and suppliers	0	26	7	130	58	221	4.00	0.876
Our organisation delivers services to its customers at a reduced cost	1	35	8	141	36	221	3.80	0.914
The integration of technology, people, business, and processes has enhanced our organisation's competitive edge in the current digital age	1	21	7	147	45	221	3.97	0.811
Our organisation can provide better products to our customers	1	25	6	146	43	221	3.93	0.844
Our organisation has an Enterprise Resource management system that tracks sales volumes and stock turnover levels which enable the company to reorder with greater accuracy.	1	25	6	149	40	221	3.91	0.835
Our sales and inventory turnover levels are reported and forecasted effectively.	1	2	10	142	40	219	3.89	0.857
Our management of inventory turnover levels helps in managing production schedules	1	24	6	126	64	221	4.03	0.891
Proper management of inventory turnover levels promotes relationships	1	24	7	151	38	221	3.91	0.821
Our company has significant financial reserve to cover all potential needs	3	32	18	140	28	221	3.71	0.912
Our company's profits have increased for the last 3 years.	3	37	17	137	27	221	3.67	0.941
Our overhead costs have reduced for the last 3 years	4	73	14	107	23	221	3.33	1.097
Our company's procurement costs have reduced for the last 3 years	0	39	20	143	19	221	3.64	0.871
Manufacturing Performance							**3.82**	**0.885**

Key: 1= strongly disagree, 2= disagree, 3 = neither agree nor disagree, 4= agree, 5= strongly agree

Note. This table was created by the author of this article.

Inferential Statistics Analysis

Correlation Test

The correlation analysis was conducted to examine the strength and direction of relationships between the study variables, particularly to assess potential multicollinearity among the independent variables and to understand how each variable related to manufacturing company performance. A correlation analysis was conducted using Spearman's correlation coefficient to examine the relationships between the study variables. The test was appropriate given the ordinal

nature of the data collected through the Likert scale measurements. Table 5 presents the results of the Spearman Correlation Matrix for the study variables.

Table 5: Results of Spearman Correlation Matrix for Study Variables

		Performance of manufacturing companies
Circular returns management	Correlation Coefficient	.434**
	Sig. (2-tailed)	.000
	N	221
Circular supply chain reconfiguration	Correlation Coefficient	.408**
	Sig. (2-tailed)	.000
	N	221

***. Correlation is significant at the 0.02 level (2-tailed).*

Note. This table was created by the author of this article.

Circular returns management exhibited a strong positive correlation with the performance of manufacturing companies ($r = 0.434$, $p < 0.01$). This moderate correlation indicated that more effective circular returns management practices were associated with better performance outcomes for manufacturing companies. Similarly, circular supply chain reconfiguration showed a moderate positive correlation with performance ($r = 0.408$, $p < 0.01$), suggesting that companies that were more adept at reconfiguring their supply chains in line with circular economy principles tended to perform better.

Hypothesis testing

Test for Hypothesis One

The first objective of the study was to determine the effect of circular returns management on performance of manufacturing companies in Kenya. The corresponding hypothesis was:

Ho_1: Circular returns management has no significant effect on the performance of manufacturing companies in Kenya.

A univariate analysis was therefore conducted to test the null hypothesis. From the model summary findings in Table 6, the adjusted r-squared for the relationship between circular supplier sourcing and performance of manufacturing companies in Kenya was 0.378; this is an indication that at 95% confidence interval, 37.8% variation in performance of manufacturing companies in Kenya can be attributed to changes in circular returns management practices. However, the remaining 62.2% variation in supply chain performance suggests that there are other factors other than circular returns management practices that explain performance of manufacturing companies in Kenya.

Table 6: Model Summary for Circular Returns Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615[a]	.378	.375	.69281

a. Predictors: (Constant), Circular returns management

b. Dependent Variable: Performance of manufacturing companies

The ANOVA results for this hypothesis captured in table 7 showed that the model was statistically significant ($F = 53.429$, $p < 0.001$). This indicates that circular returns management significantly influences the performance of manufacturing companies in Kenya. The significant F-statistic confirms that the predictor variable, circular supplier sourcing, contributes meaningfully to the model, explaining a portion of the variance in performance. Since the Fvalue is large at 53.429, it indicates that the model explains a significant portion of the variation in the performance of manufacturing companies in Kenya. These findings suggested that as

manufacturing companies in Kenya increased their focus on circular returns management, their overall performance tended to improve. Additionally, the null hypothesis was rejected and the alternative hypothesis was upheld as the p value was below the significant value of 0.05 at 0.000, meaning that means that there is enough evidence to conclude that Circular returns management does have a significant impact on performance.

Table 7: ANOVA for Circular Returns Management

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.876	1	4.876	53.429	.000[b]
	Residual	19.987	219	0.091		
	Total	24.863	220			

a. Dependent Variable: Performance of manufacturing companies

b. Predictors: (Constant), returns management

From the results in table 8, the following regression model was fitted.

Y (Performance of manufacturing companies) =1.329+0.331X_1 (Circular returns)

The coefficient results showed that the constant had a coefficient of 1.329 suggesting that if circular returns management was held constant at zero, performance of manufacturing companies in Kenya would be at 1.329 units. In addition, results showed that circular returns management coefficient was 0.331 indicating that a unit increase in circular returns management would result in a 0.331 increase in supply chain performance. It was also noted that the P-value for circular returns management coefficient was 0.000 which is less than the set 0.05 significance level indicating that circular returns management was significant. Based on these results, the study rejected the null hypothesis and accepted the alternative that Circular returns management has a significant effect on the performance of manufacturing companies in Kenya.

Table 8: Beta Coefficients for Circular Returns Management

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.329	.096		13.857	.000
	Circular supplier sourcing	0.331	.045	.443	7.310	.000

a. Dependent Variable: Performance of manufacturing companies

Test for Hypothesis Two

The second objective of the study was to assess the moderating effect of circular supply chain reconfiguration on the relationship between circular returns management and performance of manufacturing companies in Kenya. Moderation happens when the relationship between the dependent variable and the independent variables is dependent on a third variable (moderating variable). The effect that this variable has is termed as interaction as it affects the direction or strength of the relationship between the dependent and independent variable. To achieve this research objective, the study computed moderating effect regression analysis. Supply chain reconfiguration was introduced as the moderating variable.

Ho_5: Circular supply chain reconfiguration has no significant moderating effect on the relationship between circular returns management and performance of manufacturing companies in Kenya.

$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 (X_1 Z) + e}$

Where:

Y = Performance of manufacturing companies

β_0= Intercept coefficient or value of dependent variable when the independent variable is zero
β_1= Coefficient for circular returns management
X_1 = Circular returns management
β_2= Coefficients for interaction terms between supply chain reconfiguration and circular returns management
Z = Circular supply chain reconfiguration
e = Error term

Table 9: Model summary between Circular return management and Manufacturing performance with the moderating variable of supply chain reconfiguration

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.615[a]	.378	.375	.69281	.378	133.87	1	219	.000
2	.712[b]	.506	.502	.61862	.070	30.701	1	218	.000

a. Predictors: (Constant), Circular return management
b. Predictors: (Constant), Circular return management, Supply chain reconfiguration

Table 9 shows the model summary which has a positive relationship; R= 0.378, between the Circular return management and Manufacturing performance. The combined linear effects of the variables explained 37.8 percent variance in the management. This implied that management was lowly predictable by the determinant. The table also shows the 2nd model summary which has a positive relationship; R= 0.070, between the circular return management and Manufacturing performance with the moderating variable of supply reconfiguration. The combined linear effects of the variables explained 7 percent variance in the manufacturing performance. This implied that manufacturing performance was lowly predictable by the determinant with effect from supply chain reconfiguration.

Table 10: ANOVA table between Circular return management and Manufacturing performance with the moderating variable of supply chain reconfiguration

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.876	1	4.876	53.429	.000[b]
	Residual	19.987	219	0.091		
	Total	24.863	220			
2	Regression	85.568	2	42.784	111.795	.000[c]
	Residual	83.428	218	.413		
	Total	168.995	220			

a. Dependent Variable: Manufacturing Performance
b. Predictors: (Constant), Circular return management
c. Predictors: (Constant), Circular return management, Supply Chain Reconfiguration

Table 10 shows the test of significance of the model using ANOVA between Circular return management and Manufacturing performance. There are a total of 220(N-1) degrees of freedom. With 1 predictor variables, the regression effect has 1 degrees of freedom. The regression effect was statistically significant; F(1,219)=53.429, p=.000). The test of significance of the model using ANOVA between Circular Return Management and Manufacturing performance with the moderating variable of Supply Chain Reconfiguration. There are a total of 220(N-1) degrees of

freedom. With 2 predictor variables, the regression effect has 2 degrees of freedom. The regression effect was statistically significant; F(2,218)=111.795, p=.000).

Table 11: Regression Analysis between Circular return management and Manufacturing performance with the moderating variable of supply chain reconfiguration

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.329	.096		13.857	.000
	Circular return management	0.331	.045	.443	7.310	.000
2	(Constant)	.881	.216		4.083	.000
	Circular return management,	.454	.060	.455	7.528	.000
	Supply Chain reconfiguration	.359	.065	.335	5.541	.000

a. Dependent Variable: Manufacturing Performance

Table 11 shows that out of the 1 predictors that displayed significant relationships, Circular return management (β=.331, p<.05) had a higher influence on the criterion variable. This implies that a change in one unit (going up) of a predictor, Manufacturing performance is predicted to go up by the standardized β-value shown in the table. For instance if Circular return management which had a higher influence goes up by one unit Manufacturing performance goes up by .331.

Further, by substituting the beta values as well as the constant term from the coefficient's findings for the first step regression modelling, the following regression model will be fitted:

$Y = 1.329 + 0.331\ \mathbf{X_1}$

Where $\mathbf{X_1}$ is Circular Returns Management

The second model under table 11 shows that out of the 1 predictors that displayed significant relationships, Circular return management (β=.454, p<.05) had a higher influence on the criterion variable with Supply Chain reconfiguration (β=.359, p<.05 had a positive influence on the criterion variable as a moderating variable. This implies that a change in one unit (going up) of the moderating variable, the predictor goes up, Manufacturing performance is predicted to go up by the standardized β-value shown in Table 11. This means that if supply chain configuration influences positively the Circular return management goes up by one unit influencing Manufacturing performance by going up by .454.

By substituting the beta values as well as the constant term from model 2 emanating from the second step in regression modeling the following regression model was fitted:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 (X_1 Z) + e$ expressed as

$Y = 0.881 + 0.454\ X_1 + 0.359(X_1 Z)$

Where:

Y = Performance of manufacturing companies

β_0= Intercept coefficient or value of dependent variable when the independent variable is zero

β_1= Coefficient for circular supplier sourcing

X_1 = Circular supplier sourcing

β_2= Coefficients for interaction terms between supply chain reconfiguration and circular supplier sourcing

Z = Circular supply chain reconfiguration

e = Error term

CONCLUSION RECOMMENDATIONS

Conclusion

The study revealed that there was a significant relationship between circular returns management and performance of manufacturing companies in Kenya. The findings also showed that circular returns management positively influences the performance of manufacturing companies in Kenya, highlighting the importance of returns management practices in improving organizational performance. The study accepted the alternative hypothesis that there is a significant positive relationship between returns management and performance of manufacturing companies in Kenya. Effective circular returns management practices contribute positively to manufacturing company performance, emphasizing the importance of resource recovery and waste management in the circular economy model.

Recommendations

Companies in Kenya should focus on improving circular returns management practices to enhance performance and optimize resource use. By adopting advanced logistics systems and digital technologies like block chain and IoT, companies can track and streamline reverse supply chain processes. Training employees and establishing partnerships with third-party recyclers can further enhance efficiency. Additionally, the companies have to be very aware of the type of products that they are dealing with so as to categorize, plan and accommodate the returns policy and guidelines according to the life cycles of the products they hold noting that short life cycle goods have a higher depreciation rate in comparison to long life cycle goods hence different policies applicable.

Additionally, when reconfiguring supply chains to support circular returns management practices, companies should carefully evaluate the scope and potential effects of these changes. In this case, companies must assess the financial and operational impact of these changes while ensuring they do not compromise supply chain operations within the companies involved. Besides, conducting pilot programs, collaborating with stakeholders, and leveraging digital tools for data-driven decision-making will help the companies achieve the desired balance.

To build upon the findings of this study, the following further research areas are suggested: The study was limited to the variables: circular returns management with supply chain reconfiguration as a moderating variable. The study recommends that similar studies to be conducted with inclusion of other circular supply chain management practices variable and with a different moderating variable. Future research should also focus on a longitudinal study to assess the long-term effects of circular returns management practices on the performance of manufacturing companies in Kenya.

Additionally, to enhance the quality and impact of the paper, it is suggested that future research incorporate a mixed-methods approach, combining quantitative data with qualitative insights from industry practitioners. This could provide a richer understanding of the barriers to implementing circular returns management practices and the contextual factors influencing performance. It is also good to note that the study focused on the entire manufacturing industry. Although the industry was selected as it is one of the largest sectors in the country, a comparative study of circular supply chain management practices across various industries in Kenya could help identify sector-specific challenges and best practices in circular economy implementation. Furthermore, other comparative studies touching the different sectors of the manufacturing industry in Kenya can be conducted to add on more knowledge of the industry.

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