

**FOURTH PARTY LOGISTICS SERVICE AND  
PERFORMANCE OF FOOD AND BEVERAGE  
MANUFACTURING FIRMS IN KENYA**

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**Fourth Party Logistics Service and Performance of Food and Beverage  
Manufacturing Firms in Kenya**

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Degree of Doctor of Philosophy in Supply Chain Management of the  
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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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## **DEDICATION**

This thesis is dearly dedicated to my family for their tireless support, prayers offered, understanding accorded throughout the tedious research period and my academic life. It is from their care that my life is inordinately elevated. They are an extreme source of my encouragement and may the God Almighty bless them in great measures, may they experience His favour that cannot be fathomed both now and, in the days, to come.

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To the almighty God the creator of heavens and the earth, the LORD who is infinite in being and perfection, the purest spirit, inviable, without body, parts or passions immutable, immense, eternal, incomprehensible, almighty, most wise, most holy, most free, most righteous will, for his own glory: most loving, gracious, merciful, longsuffering, abundant in goodness and truth, forgiving iniquity, transgression and sin: the rewarder of them who seek Him and withal, most just, and terrible in His judgments, hating all sin and Who will by no means clear the guilty.

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## ACCRONYMS AND ABBREVIATIONS

<b>4PL</b>	Fourth Party Logistics
<b>CRM</b>	Customer Relationship Management
<b>GDP</b>	Gross Domestic Product
<b>GOK</b>	Government of Kenya
<b>KAM</b>	Kenya Association of Manufacturers
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>KPA</b>	Kenya Ports Authority
<b>KSC</b>	Kenya Shipping Council
<b>LIS</b>	Logistics Management System
<b>LLPs</b>	Lead Logistic Providers
<b>LP</b>	Logistics Performance
<b>LPI</b>	Logistics Performance Index
<b>LPS</b>	Load Planning System
<b>LSPs</b>	Logistics Services Providers
<b>NCPDM</b>	National Council of Physical Distribution Management
<b>OP</b>	Order Processing
<b>SKU</b>	Stock Keeping Unit
<b>WB</b>	World Bank
<b>WMS</b>	Warehouse Management System

## DEFINITION OF OPERATIONAL TERMS

**Customer Relations Management** A strategic planning, monitoring and controlling how the business process and the entire organization relates with the customers in terms of meeting their expectations and fulfilling their needs (Min, Meng, Chu, & Wang, 2020).

**Fourth Party Logistics Services** These are the logistics services provided by a company that has no product of its own or any transport infrastructure but just acts as a facilitator for the movement of the product from the manufacturer to the final consumer (Ji, 2021).

**Food and Beverage Manufacturing Firms** These are firms that deal with the production and supply of goods and related products such as carbonated beverages, alcoholic drinks, and other household edible foods and beverages (KAM, 2021).

**Freight Management** Freight management involves the activities involved in shipping any goods or finished products from suppliers to a facility or to warehouses and sales locations (Jones & Rashid, 2020).

**Logistics Information System** It is the sharing of information on transfer or exchange of information indicating the level and position of inventory, sales data, and forecasting information, information about the status of orders, production schedules and delivery capacity, and firm performance measures (Saliba, 2013).



**Internal policy framework** These are procedures and policies set internally to control, plan and oversee how organizations carry out their supply chain and logistics processes (Hameed, Nisar, & Wu, 2021). These policies provide the framework for outsourcing the fourth-party logistics services and the guidelines for the engagement in logistics processes through the 4PL.

**Manufacturing Firms** It is the industry that comprises of processing of raw materials, assembling products, parts and repairing of manufactured products (KAM, 2021).

**Performance** This is the ability of a firm to record superior results in terms of its finances, operational efficiency and customer satisfaction orchestrated by continued focus on new changes that make their operations seamless and cost-efficient (Mikalef & Gupta, 2021).

**Product Packaging** It is used for convenience and information transmission. Packages and labels communicate how to use, transport, recycle, or dispose of the package or product (Peck, 2015). The 4PL companies often repackage products from the manufacturers to appeal the customers and meet any guidelines from the Manufacturer.

**Third Party Logistics Services** It is the outsourcing of logistics and supply chain management functions to a specialized external provider.

These providers offer a range of services that help businesses efficiently manage their logistics operations, allowing them to focus on their core competencies (Ngonela, Mwaniki & Namusonge, 2014).

## ABSTRACT

Most food and beverage manufacturing firms in Kenya operate at a declining technical efficiency compared to their counterparts in South Africa and Malaysia. Notably, the life span of food and beverage manufacturing firms in Kenya has been declining, where most of the firms have been winding up at notable percentage indices. Poor logistics outsourcing was cited as the main reason. The aim of this study was to establish the relationship between fourth party logistics services and performance of food and beverage manufacturing companies in Kenya. Specifically, the study sought to establish the relationship between freight management, logistics information systems, customer relations management, product Packaging and Internal policy framework on performance of food and beverages manufacturing firms in Kenya. To achieve this, the researcher reviewed both theoretical and empirical literature and then proposed the research methodology that addressed the gaps identified in literature as well as answer the stipulated research questions. This research study adopted a descriptive and cross-sectional research designs. The designs were preferred since they allowed both in-depth study of the subject and comparison of the relationship between variables. Data was collected using self-administered questionnaires. The data collected was analyzed by use of descriptive and inferential statistics. Multiple regression model was used to show the relationship between the dependent variable and the independent variables. The quantitative data generated was keyed in and analyzed by use of Statistical Package of Social Sciences (SPSS) version 27 to generate information which was presented using tables, charts, frequencies and percentages. The findings from the study revealed that freight management, logistics information systems management, customer relations management and product Packaging had a significant influence on the performance of food and beverage processing firms. Internal policy framework was also found to significantly moderate the relationship between fourth party logistics services and performance of food and beverage processing firms. The study concluded that fourth party logistics through freight management, logistics information system, customer relations management and product Packaging were critical in enhancing the performance of food and beverage processing firms in Kenya. The study recommends that the management of food and beverage processing firms ought to embrace fourth party logistics services by having a freight management framework, enhancing use of logistics information systems, bringing customers on board and embracing effective and innovative ways of Packaging the products in order to gain performance.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

The study sets out to investigate the influence of fourth party logistic services on firm performance among manufacturing firms in Kenya. To this end, this chapter builds the case by introducing the problem warranting the study. The chapter is structured into the background of the study where global, regional and local perspectives of fourth party logistics are explored; the statement of the problem; the study objectives; the significance of the study; and scope of the study.

The competitive manufacturing environment is one that is rapidly changing as globalization and technology force organizations to constantly seek ongoing improvement in all areas in terms of their knowledge, flexibility and performance (Lau & Zhang, 2016). Logistics, for example, is receiving growing attention as an area in which efficiency and productivity increases can be made in order to improve customer service and to lower costs (Sahay & Mohan, 2016). However, logistics is often not an area of core competence for many organizations. In order to compete successfully in the dynamic manufacturing environment, organizations are increasingly choosing to focus on their own area of competence and expertise. If this logistics outsourcing is undertaken and managed well, it can hold many benefits for the organization (Kersten, Bemeleit & Blecker, 2016; Buyukozkan, Feyzioglu & Ersoy, 2015).

Fourth party logistics is a term copyrighted by Accenture, a giant consulting company, who also defined it as an integrator that assembles its own and other organizations' resources, capabilities, and technologies to design, build and run a comprehensive supply chain solution. Revisiting this definition, Zhang, Li, Wang, Zhao, and Gao (2022) described a fourth party logistics as a company that manages logistics operations with the use of subcontractors and without running its own trucks on the contract. Putting it in a simple form, a fourth party logistics is a company that manages logistics operations combining and using logistics assets like trucks or warehouses from other operators with none of little its

own assets. The term lead logistic provider is used when a major portion of the assets come from the aggregator with supplement coming from other providers (Qian, Fang, Yin, Huang & Li, 2021).

### **1.1.1 Fourth Party Logistics Services**

Globally, some authors have provided dollar estimates for the size of fourth party logistics expenditures for their market. For example, according to Frost and Sullivan (2014) the fourth party logistics market as a whole recorded a considerable revenue growth in a period of over ten years. However, one may reasonably wonder about the credibility of the statistics, since fourth party logistics is not clearly defined (Frost & Sullivan, 2014). Global supply chain survey conducted by World Bank (2018) shows how leaders are moving ahead of the pack. They are tailoring their supply chains to customer needs and investing in next-generation capabilities while keeping the focus on supply chains that are both fast and efficient.

Liker and Choi (2014) described, how Japanese automotive manufacturers, Toyota and Honda, are deepening and developing their relationships with their suppliers, which leads to mutual benefits for both, the customer and supplier. Bedeman and Gattorna (2017) developed a framework for supplier relationship management. Their framework integrates the supplier management functions, which are, shaping purchasing strategies, supplier selection, collaboration, and supplier management. Additionally, Bedeman and Gattorna (2017), propose continuous improvement process to develop the SRM system which would be integral in enhancing success of fourth party logistics.

In Africa and world over it is risky for an organization to hand over its very connectivity to its customers to an outside organization. This is what organizations outsourcing logistics activities are doing. However, due to the fact that manufacturing organizations in South Africa are competing in an increasingly difficult market, many are indeed seeking to outsource their logistics activities to a logistics provider (Tatarczak, 2018). In South Africa, while there are many fourth party logistics in South Africa and many manufacturers making use of fourth party logistics, little research has been done on the practices and issues of these parties (Swanepoel, Karrapan, Sishange & Kilbourn, 2017).

In Rwanda, the competitive manufacturing environment is one that is rapidly changing as globalization and technology force organizations to constantly seek ongoing improvement in all areas in terms of their knowledge, flexibility and performance (Tukamuhabwa, Mutebi & Kwagala, 2021). Logistics, for example, is receiving growing attention as an area in which efficiency and productivity increases can be made in order to improve customer service and to lower costs (Kulkarni, Shaikh, Kurkure & Bagul, 2019; Bourlakis & Bourlakis, 2015).

The East African perspective on manufacturing firms or logistic services providers adopting the fourth party logistics model is scanty. According to Aloo and Ongwae (2021), the manufacturing industry in East Africa has managed to stay on the competitive edge through acquisition of services of skilled and experienced fourth party logistics service providers such as DHL and Kuenhe Nagel. Some companies perform their logistics services in house while other companies outsource multiple logistics providers for their supply chain management which is not only costly to run but also cumbersome to manage (Aydın, Yörükoğlu & Kabak, 2022). Relationships issues, how to share resources, property rights and confidentiality of the information are some of the issues that have arisen overtime.

Kenya has a good number of successful companies that are known to use fourth party logistics service providers. Companies such as East African Breweries Limited, Kenya Airports Authority, Kenya Pipeline Company use fourth party logistics to coordinate and integrate their supply chain operations. By embracing fourth party logistics, it implies that these companies are aiming at optimizing their core business and ensure continued commitment to innovation and competitiveness. It also implies that the companies want to perfect their supply chain operations and ensure cost-saving, thus opting to contract all their supply chain activities to fourth party logistics providers. According to Kiprono and Alexis (2021), while fourth party logistics is not widely embraced in Kenya, local companies that have opted for fourth party logistics service have continued to thrive in their core business, showing the merit of this type of logistics outsourcing towards enhancing organizational performance.

According to Aloo and Ongwae (2021), while local companies have been slow on embracing fourth party logistics, the fourth party logistics providers have extensively shown most of

the companies the need for this type of logistics, as it ensures seamless supply chain process thus enhancing the company's ability to fully focus on core business and achieve more customer satisfaction. Logistics outsourcing through fourth party logistics has also been embraced in service and retail companies in Kenya such as the supermarkets and other companies in both public and private sectors. According to Kiruja and Ngugi (2019), while other forms of logistics outsourcing such as third-party logistics will leave some supply chain activities for the outsourcing company, fourth party logistics assumes all the supply chain activities, thus being an ideal strategy to ensure continued success and perfection in the supply chain processes.

### **1.1.2 Performance of Food and Beverage Manufacturing Firms**

The food and beverage industry can be defined as the preparation of food and drink products for sale and consumption. It involves the product research and design, testing sourcing of ingredients, processing, and preservation, packaging and marketing (Rahim, Mohammad & Rahman, 2016). Majority of the international trader 's respondents ranked the quality of food and beverage industry logistics services in eastern Africa as average (OECD, 2019).

Since achieving independence, Kenya's economy has remained largely agriculture based and manufacturing being part of industrialization is a key factor in Kenya's development plans. According to KAM (2020), food and beverages is the largest sector in the manufacturing industry comprising of 197 companies contributing 21.92% of the total KAM's membership. According to Kenya Institute for Public Policy Research and Analysis (2019), the manufacturing sub-sector in Kenya constitutes 70% of the industrial sector's contribution to GDP. Chiappinelli (2020) stresses on application of problem-specific approaches on their research, the essential of processes and tasking flexibility measurement as an answer to address the market volatility and to fulfil the diverse customer needs. Manufacturing strategies consists of competitive priorities which mainly focus on effectiveness, cost, delivery, flexibility, innovation and responsiveness (Wang, Huang, Feng & Zhou, 2022). Also, competitive priorities have been widely used as part of the measurement for manufacturing strategy performance.

The sector is predominantly agro-processing, with manufacture of food, tobacco, beverages and textile accounting for over 34.0% of total sectoral value added (KIPPRA, 2019). The manufacturing sector in Kenya is among the key productive sectors identified for economic growth and development because of its immense potential for wealth, employment creation and poverty alleviation. The government's commitment to the realization of Vision 2030 depends on corroborated effort to address the costs of production and other factors contributing to the high cost of doing business (KIPPRA, 2019). The food and beverages industry have a unique role in expanding economic opportunity because it is universal to human life and health (Ngonela, Mwaniki & Namusonge, 2014).

In Africa, manufacturing firms started to focus on eliminating waste in the form of time, effort, defective units, and inventory in manufacturing distribution systems (Laraib, Asim, & Manzoor, 2021). In fierce time and quality-based competition, logistics capabilities become critical. In fact, many firms particularly those operating in commodity or convenience goods markets succeed as a result of their logistics systems, rather than innovation.

The competitive manufacturing environment is one that is rapidly changing as globalization and technology force organizations to constantly seek ongoing improvement in all areas in terms of their knowledge, flexibility and performance (Muazu, 2019). The Kenya Association of Manufacturers (2019) describes a food and beverage manufacturing company as an organization that processes foods, beverages, dairy, vegetable oil, grain milling, baking and confectionery, fruits and vegetables, meat and fish, honey, nuts, mushroom, etc.

The report revealed that food sector constitutes about a third of the manufacturing sector in Kenya and that the sector adds value to agricultural produce and therefore its success depends on efficient agriculture sector. The report further claimed that the manufacturing sector employed 966,400 people in 2019 out of which 289,319 jobs (or 33.5%) were in the foods processing sector. The Manufacturing sector contributes about 10% of the Kenya's GDP of which the food sector contributed about a third (33.4%) of the total manufacturing production in 2019 (Mars Group Kenya, 2019).



In Kenya, the performance of a supply chain can be assessed by customer sales growth and profitability which parameters look at the sale and profits generated each year with sales expected to grow each year or remain constant at the worst (Maditati et al., 2022). The Return on supply chain investment is another measure used to gauge supply chain performance. Return on supply chain investment is worked out on operating profits in excess of capital employed (Mutuku & Moronge, 2020). Performance be measured through inventory performance or fill rate which can be measured in terms of: number of Stock-keeping units, order cycle time, percentage of quality rejections, average safety inventory, percentage fraction of time out of stocks, percentage of seasonal inventory and inventory turn-over (Ngolena, Mwaniki & Namusonge, 2014; Mwaura, Letting, Ithinji & Bula, 2016).

Logistical performance can be measured through: total transportation costs, number of vehicles operated, percentage of outbound shipments, average outbound shipment size, percentage of inbound shipments, percentage average inbound shipment size, fraction of transportation mode, percentage on timely delivery, percentage of accidents, average kilometers vehicles running full load or empty per day (Hoekman, & Sanfilippo, 2018). Cash conversion cycle and percentage of internal and external complaints for data unavailability also measure optimization.

The food processing sector can therefore be a key driver of the economic growth and growth in this sector can have a direct and significant impact on the whole Kenya's economy. Logistics, for example, is receiving growing attention as an area in which efficiency and productivity increases can be made in order to improve customer service and to lower costs (Musau, Namusonge, Makokha & Ngeno, 2017). In this case, a fourth party logistics designs, co-ordinates and executes a supply chain strategy while providing the company with value-added information to better manage core competencies.

## **1.2 Statement of the Problem**

The Kenyan manufacturing sector is one of the critical pillars of the country's economy, contributing to an average of 10% to the annual Gross Domestic Product (GDP) (Kenya National Bureau of Statistics - KNBS, 2021), and with a potential of contributing to over

30% of the GDP (World Economic Forum - WEF, 2022). The industry comprises of several sub-sectors as listed by the Kenya Association of Manufacturers (KAM), and one of them is food and beverage manufacturing sub-sector. Despite the sub-sector having majority of the firms as per KAM, the contribution of the food and beverage manufacturing firms remains low compared to other sub-sectors such as the building and construction, chemical and allied manufacturing sub-sectors (KNBS, 2022). According to the economy survey by KNBS (2022), food and beverage manufacturing firms contributed to 14% of the productivity in the manufacturing sector, whereas chemical and allied had 19.5%, metal and allied with 22.7% and construction and building had 24.2%.

Moreover, more than 7 food and beverage manufacturing firms are in the verge of closing down their business following years of loss-making (KNBS, 2021). According to the economic survey (2022), while the entire manufacturing industry recorded a 24.7% growth in exports between 2017 and 2021, the food and beverage manufacturing sector only grew its exports by 11% in the same period. The overall growth of food and beverage manufacturing sub-sector stood at 0.3% against the entire manufacturing industry's 1.6% growth in 2021, implying that despite the sub-sector being the largest, its growth rate is the least (Ministry of Trade and Investment, 2022).

The existing literature has shown mixed results with regard to fourth party logistics and its influence on firm performance. Shale (2015) on the role of fourth party logistics service providers on supply chain performance in distribution firms revealed that 4PL through transport management; inventory management and information flow management significantly influence firm performance. Kiruja and Ngugi (2019) on the other hand established that valued added services and delivery scheduling are essential fourth- and third-party logistics services that significantly influence firm performance. On the other hand, Mehmman and Teuteberg (2016) established that fourth party logistics had no significant effect on firm performance. Moreover, most of the available studies have focused on different contexts from this study with scant evidence available on how fourth party logistics affect performance of manufacturing firms in a Kenyan context. This study therefore sought to bridge this gap by assessing the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya.

### **1.3 Study Objectives**

#### **1.3.1 General Objective**

The general objective of this study was to investigate the relationship between fourth party logistics service and performance of food and beverage manufacturing firms in Kenya.

#### **1.3.2 Specific Objectives**

The specific objectives for this study were:

1. To assess the relationship between freight management and performance of food and beverage manufacturing firms in Kenya.
2. To determine how logistics information system management relates with performance of food and beverage manufacturing firms in Kenya.
3. To examine the effect of customer relations management on performance of food and beverage manufacturing firms in Kenya.
4. To investigate the relationship between product packaging and performance of food and beverage manufacturing firms in Kenya.
5. To determine the moderating effect of internal policy framework on the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya.

### **1.4 Research Hypotheses**

The study was guided by the following hypotheses:

1. **H<sub>0</sub>**: Freight management has no significant relationship with performance of food and beverage manufacturing firms in Kenya.

**H<sub>A</sub>**: Freight management has a significant relationship with performance of food and beverage manufacturing firms in Kenya

2. **H<sub>0</sub>**: Logistics information system management has no significant relationship with performance of food and beverage manufacturing firms in Kenya.

**H<sub>A</sub>**: Logistics information system management has a significant relationship with performance of food and beverage manufacturing firms in Kenya.

3. **H<sub>0</sub>**: Customer relations management has no significant relationship with performance of food and beverage manufacturing firms in Kenya.

**H<sub>A</sub>**: Customer relations management has a significant relationship with performance of food and beverage manufacturing firms in Kenya.

4. **H<sub>0</sub>**: Product packaging has no significant relationship with the performance of food and beverage manufacturing firms in Kenya.

**H<sub>A</sub>**: Product packaging has a significant relationship with the performance of food and beverage manufacturing firms in Kenya

5. **H<sub>0</sub>**: Internal policy framework does not significantly moderate the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya.

**H<sub>A</sub>**: Internal policy framework significantly moderates the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya.

### **1.5 Significance of the Study**

Today's global economy is characterized by continuous change and increasing turbulence. Technological development is unfolding at a growing pace, bringing forward new products and more efficient production methods. Competition is harder than ever and firms at a global level must provide high-quality and low-cost goods in order to retain their market share. Customers, on the other hand, besides being more informed, demand better service and have a much broader spectrum of needs, reaching from quality to corporate social responsibility and environmental awareness, in other words in this new business era customers are in the

driving seat (Zhang, Maina & Viry-Chatillon, 2019). It is against this backdrop the present study could be beneficial to the following:

### **1.5.1 Manufacturing Companies**

The study would help supply chain managers in manufacturing firms for better understanding on fourth party logistics and device mechanisms to ensure efficient and effective delivery of goods and services. The study also highlighted the role played by internal policy framework in ensuring effectiveness of fourth party logistics. This would be a key point of reference to enable the firms embrace fourth party logistics for enhanced performance.

### **1.5.2 Management of Logistics Service Providers**

The study would assist the logistics companies to understand major areas of concern for seamless movement of goods and services from the point of origin to the end users. It would also facilitate knowledge of understanding structures to put in place so that they can be competitive in their services. Moreover, the study would give insights on areas that require additional resources in order to improve quality of service. In general, it would help logistics providers to formulate policies that would aid effective service delivery for a better and pronounced performance.

### **1.5.3 Government and other Regulatory Bodies**

The study would assist the government to have the holistic approach of ensuring growth and development of logistics providers in supply chain management performance in manufacturing companies in Kenya. The study would provide relevant information that would help the government and other regulatory bodies to formulate and implement such policies that would facilitate effective strategic management on logistics providers. The findings of this study would also help the policy makers to review and develop policies that would guide logistics industry in Kenya.

#### **1.5.4 Researchers and Academicians**

The findings of this study would become useful to forming the basis for future research on the subject, providing a critical examination of the field. The findings would act as a reference point to other researchers in the same field thus facilitating their studies. The researcher would make recommendations on influence of outsourcing fourth party logistics providers on the performance of manufacturing companies in Kenya and how to gain optimal value through logistics outsourcing and also suggest areas where further studies can be done on the same.

#### **1.6 Scope of the Study**

The aim of this study is to assess the influence of fourth party logistics service providers on performance of food and beverage manufacturing firms in Kenya. More specifically, the study confine itself to four components of the fourth party logistics including freight management, logistics information system management, customer relations management, product Packaging and Internal policy framework in relation to performance of food and beverage manufacturing firms. The study focused on 197 food and beverages manufacturing companies in Kenya registered under KAM 2021 directory. These firms are spread across the country. The Manufacturing sector contributes about 10% of the Kenya's GDP of which the food sector contributes about 33.4% of the total manufacturing production (KNBS, 2021). The food manufacturing sector is therefore a key driver of the economic development and growth in this sector can have a direct and significant impact on the overall Kenya's economy. Manufacturing companies by the nature of their business require multiple logistics services and such services are offered by fourth party logistics providers who integrate or bundle together according to the requirements of their customers. The study focused on a timeline scope of five years whereby the performance of the food and beverage processing firms in relation to specific aspects of fourth party logistics was tied to a five-year span. This was from the year 2016 to 2020. The timeframe was considered appropriate in that it has been a turbulent time in business world with increased dynamisms and economic changes.

## **1.7 Limitations of the Study**

The confidentiality policy of the firms restricted some sampled respondents from filling in the questionnaire for fear of exposing the firms' private information. This was mitigated by assuring the respondents of utmost confidentiality and anonymity of the information they provide. An introduction letter was obtained from the university and a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) was presented to the companies' management in order to eliminate suspicion and enable the respondents to disclose the information sought. Other limitations included some of the respondents not filling or completing the questionnaire correctly because of misunderstanding of some issues. This was mitigated by the clarification of issues that could not be easily understood by respondents. Also, inadequate responses to the study questions and unexpected occurrences like respondents leaving before completing the questionnaire were encountered. These challenges were mitigated through constant reminders and revisit to the respondents during the survey period.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents the literature review on fourth party logistics services and firm performance among food and beverage manufacturers in Kenya. It summarizes the information from other researchers who have studied the field. The review covers both the theoretical and empirical reviews of the existing literature. The review has been used to develop conceptual frame work for the study.

#### **2.2 Theoretical Framework**

A theory is a set of interrelated principles and definitions that present a systematic view of the phenomena by specifying relationships among variables with the purpose of explaining natural phenomena (Kothari, 2014). In effect a theory includes a set of basic assumptions and axioms as the foundation and the body of the theory is composed of logically interrelated empirically verifiable prepositions. A theory is a presentation of thoughts and/or assumptions and observation of an individual or group of persons describing why given phenomenon are the way they are (Heeks & Stanforth, 2015). Theoretical framework therefore is the systematic review of theories and concepts that are related to a given study in order to give an insight on the basis of the study problem. Through theoretical review, research problem of the study is justified. Theoretical framework can also be defined as a broad theory-based explanation and the concept of causality through which given concepts in a study are expounded (Schulz, 2010). The main theories reviewed in this study include: the logistics theory, the principal agency theory, partnership theory, the theory of trying and the lean theory.

##### **2.2.1 The Logistics Theory**

This theory was first developed by Mentze (1995) in which he defined logistics as the planning, organization, and control of all activities in the transport flow, from raw material until final consumption and reverse flows of the manufactured product, with the aim of



satisfying the customer's and other interest party's needs and wishes that is., to provide a good customer service, low cost, low tied-up capital and small environmental consequences (Liu & Lyons, 2011). Logistics in the manufacturing sector is also defined as those activities that relate to receiving the right product or service in the right quantity, in the right quality, in the right place, at the right time, delivering to the right customer, and doing this at the right cost.

In most of the cases freight management is seen from the perspective of an operative way of transporting or moving materials from one warehouse to another or producing service (McNichols & Brennan, 2016). The credibility of this operation is based on how good is the design of the system that leads to this kind of logistics. Freight management encompasses operative responsibilities, which include administration, operation and purchase and constructive duties as well as detailed design, examples include track and trace systems, fuel management systems and fleet scheduling and routing (Chang, 2011).

Freight management in the manufacturing sector is that part of procurement management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements (Crujssen, Cools & Dollaert, 2013). Freight management activities in the manufacturing sector typically include inbound and outbound transportation management, fleet management, track and trace systems, fuel management system, order fulfillment, logistics network design and management of fourth party logistics services providers (Lau & Zhang, 2016).

To varying degrees, the freight management function also includes sourcing and procurement, production planning and scheduling, and customer service. It is involved in all levels of planning and execution strategic, operational, and tactical. Freight management is an integrating function which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions, including marketing, sales, manufacturing, and information technology in the manufacturing sector (Bask, 2011).

To fourth party logistics, the logistics theory presents the link between the parties for gaining the best possible results from logistics cooperation (Herbert *et al.*, 2013). Over time, mutual

adjustments improve administrative and logistical systems, making them more efficient. By entering into close cooperation with fourth party logistics providers who possess complementary competencies, the individual firm is able to utilize freight resources and skills controlled by other players (Haakansson & Ford, 2012). Thus, managers of manufacturing companies in Kenya need to ensure efficient and effective logistical integration of all logistics activities to gain competitive advantage from the fourth party logistics providers by managing their lead-time. In this study, the logistics theory is linked to freight management variable.

### **2.2.2 The Principal Agency Theory**

The 1976 article “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure” by Jensen and Meckling helped establish Agency Theory as the dominant theoretical framework of the supply chain literature, and position shareholders as the main stakeholder. The adoption of the agency logic increased during the 1980’s as companies started replacing the hitherto corporate logic of managerial capitalism with the perception of managers as agents of the shareholders ((Bourlakis & Bourlakis, 2015). This theory is based on the separation of ownership and control of economic activities between the agent and the principal. Various agent and principal problems may arise including conflicting objectives; differences in risk aversion, outcome uncertainty, and behavior based on self-interest, and bounded rationality. This may for example entail an agent having a different concept of database design and inventory systems that do not concur with the principles needs.

The contract between the principal and the agent governs the relationship between the two parties, and the aim of the theory is to design a contract that can mitigate potential agency problems (Atos, 2019). The “most efficient contract” includes the right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal. Creating contracts with supply chain partners that balance rewards and penalties, misalignment can be mitigated. Balancing the need of the shipper and the capability of the fourth party logistics provider is a well-known managerial issue that explicitly implies the risk of agency problems (Armistead & Mapes, 2013). The logistics information system

management by an agent for the principle should ensure there is no misalignment between the two and a balance of rewards should be reached.

The Principal Agency Theory suggests an “inter-firm contracting perspective” on fourth party logistics, focusing on the design of an efficient contract between the buyer and seller of logistics services, such as logistics information system management (Aldin, Brehmer & Johansson, 2014). The idea is to develop the most efficient combination of outcome and behavioral incentives in the contract between the shipper and the fourth party logistics provider. The extent to which the fourth party logistics provider’s performance can be measured and controlled has a great effect on whether the provider is paid by actual inventory management performance (for example; number of orders picked, packed, and shipped to the customers) or according to production management system (for example; salaries, hours, and/or miles).

Not all aspects can be covered ex ante in the contract. Therefore, the issue of contracting should be a revisiting issue in fourth party logistics relationships (Alavi & Carlson, 2012). Thus, the food and beverages manufacturing firms can use the Principal Agency Theory to mitigate on logistics risks and achieve the optimal value of the outsourced services from the fourth party logistics firms. Because theory provides a useful tool to respond to transaction cost dilemmas through contractual and non-contractual remedies in logistics, it is critical for managers to understand and mitigate logistics challenges associated with behavior uncertainty, relationship management, collaboration and uncertainty in logistics management (Bagchi & Skjoett-Larsen, 2012). In this study principal agency theory is linked to logistics information system management variable.

### **2.2.3 The Partnership Theory**

The main reasons for partnership are the threat of a central authority, common objectives or self-interest. This threat may be a positive or negative factor. The 17<sup>th</sup> Century philosopher Hobbes (1651) argued that it was difficult to develop partnership without a strong central authority. In supply chain, the common model through which theorists study the relationship between supplier and buyer is known as the partnership theory. In its basic nature, the partnership model depicts the buyer and supplier as partners with a common interest which

is customer satisfaction. A manufacturing company can have a partner handling customer relation in issues such as dealing with customer feedback channels and product returns and recalls management (Lee, Rho & Lee, 2013).

Partnership is a business relationship based on mutual trust openness, shared risks and rewards that enables an organization gain competitive advantage leading in the company achieving a performance that's far much greater than the firm would have achieved when operating as single entities. This model requires efficient information exchange between the buyer and supplier which is a critical element of any partnership, this entails issues such as; customer feedback channels and product returns and recalls management, when handling returns and recalls mutual trust and openness is a prerequisite so as to achieve the desired customers satisfaction levels (Kaynak, 2010).

The theory further states that any partnership is always based on value and present for each other. The solid and long-term relationship simply implies continuous improvement of the organization performance. Suppliers must provide better services, that is; customer feedback channels, customization and value addition of products and product returns and recalls management, that is of high quality than his competition at a price reasonable and still achieve goals to remain in business. Partnership model according to Wang, Guo, and Zeng (2021), increases company efficiency through cooperation; both parties obtain cost reduction which leads to price reduction and therefore increasing the customer satisfaction and market share profit margin as well. This leads to a firm gaining a competitive edge and efficiency.

The character which forms the perceived attributes of partnership include the following; high frequency of both formal and informal communication, cooperative attitude, trusting relations are built, problem solving that is win negotiation style, long term business agreement, open sharing of information and there is always defect prevention approach (Joiner, 2012). Firms recognize each other as partners; all the activities are coordinated and planned both in short term and long term.

A long-term mutual commitment and adjustments as well as a customized rather than standardized solution contribute to the uniqueness and heterogeneity of customer relations management. Partnership theory could help manufacturing firms to understand how to use

fourth party logistics to shortcut an upcoming need for customer relations competence configuration. Therefore, manufacturing firms should be able to evaluate fourth party logistics' customer relations management providers to ensure that they choose competent companies to handle their customer relations management in a manner that adds value to it. In this study, partnership theory is linked to customer relations management variable.

#### **2.2.4 The Theory of Trying**

The theory of trying was advocated by Bagozzi and Warsaw (1990) in their book; "supply chain value addition by Packaging" it focuses on the assessment of trying to act, especially purchasing tendencies. In this case trying to buy an item, in other words, in theory of trying "an attitude toward a reasoned action is replaced by an attitude toward trying and an intention is restricted to an intention to try" how a product is packaged and labeled elicits all these chain reactions in the mind of consumer (Ghosh, 2019). The theory of trying divided goals into two categories: intermediate and end-state goals. In relation to this theory, Ballot and Fontane (2010) identified two main reasons of why consumers may fail to try to consume.

Firstly, consumers may fail to consider the options available to them. Secondly, consumers may consciously refrain from buying for various reasons. The theory of trying provides an interesting alternate approach to the models previously considered. Rather than examining explicit behavior, the model assesses trying to act. Subjective norms, attitude toward the process or means of trying, attitudes and expectations of success and attitudes and expectations of failure are posed as the key antecedent variables to intention to try; itself the key precursor to trying. An illustrative and descriptive label makes a consumer to want to try an item while clear and consistent branding helps the consumer act the subsequent buying time (Witjaksono, 2012).

Based on pack design, that is if its protective and attractive, past behaviour has been found to influence consumer choice in a number of studies; Tari, Molina and Castejun (2010) and Tukamuhabwa, Eyaa and Derek (2011), thus integrated as a key influence within the theory. Zai (2021) suggests in discussion of this theory that rather than consumers having behavioural intentions, they rather have behavioural goals in many situations, and they must expend effort and make the purposive endeavour to fulfil these goals. To date the theory of

trying has mostly been applied to supply chain consumer buying related decisions, and many studies have applied it to retail consumption decisions concerning product Packaging. In this study, the trying theory is linked to product Packaging variable.

### **2.2.5 The Lean Theory**

Lean principles are derived from the Japanese manufacturing industry. The term was first coined by John Krafcik in his 1988 article, "Triumph of the Lean Production System". Lean is a functional model which basically discounts the value of economies of scale, control levels and focuses on how to reduce costs as a result of small, incremental and continuous improvement. Lean logistics has certainly become increasingly significant in logistics management. Initially organizations involved in manufacturing of products used to involve themselves in lean manufacturing techniques, this has not ceased as lean has expanded beyond manufacturing (Akinnuli, Farayibi, & Ojo, 2020).

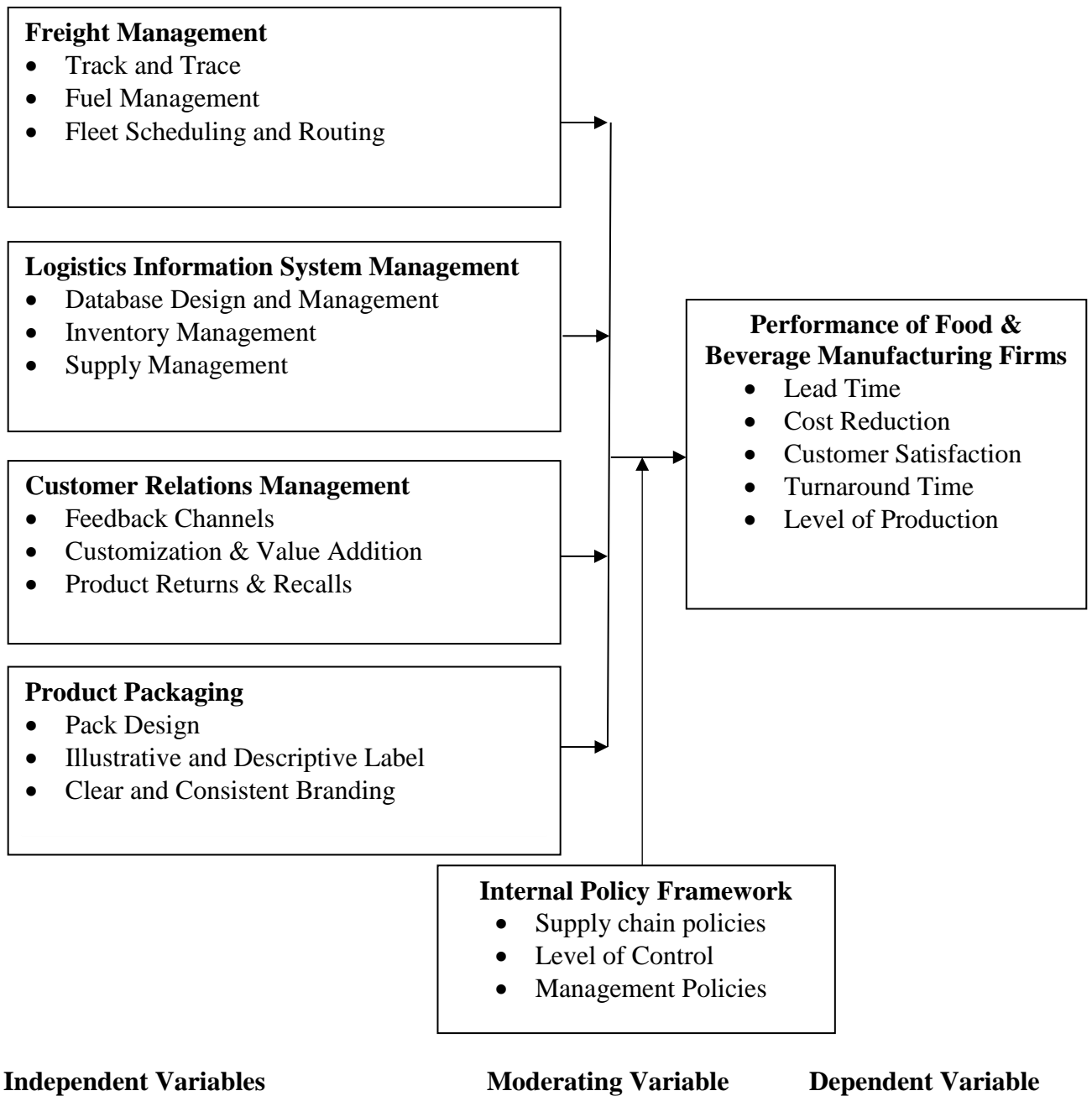
Lean logistics policy seeks to explain how organization should manage its logistics outsourcing systems and needs by ensuring that the internal systems are properly aligned to support the outsourced logistics. It states that outsourcing can be used as a strategic differentiator by the organization and further goes on to say that not all logistics is about transportation, it may include aspects such as customer relations management, information system management and product Packaging (Finch, 2014). The theory stated that logistics strategies developed by an organization should support the customer's need and expectations.

The strategies outlined in lean theory uphold the need for aligning the internal policies should ensure they fully support the supply chain processes. Through the internal policies on supply chain, a company sets whether it will outsource its logistics or whether it will carry out its own supply chain activities. The differences in internal policies regarding the supply chain logistics will tell whether the company can achieve its core mandates and how effective will the supply chain operations be to enhance performance (Masudin, Kamara, Zulfikarijah, & Dewi, 2018). Logistics strategies should not be a driver on how much and when will supply chain and logistics operations will be outsourced and how the entire supply chain processes will be carried out.

Manning the control levels and management policies through properly set internal policies would imply that the companies will operate in terms of lean management and supply chain processes. Real savings can only be realized through day to day management and optimization of logistics requirements variability. This therefore implies that cost associated with logistics cannot be achieved through inconsistent internal logistics policy framework (Fisher, 2010). The lean theory is relevant to the study because internal policy framework is a key component in effective and efficient fourth party logistics management hence the need to link the two.

### **2.3 Conceptual Framework**

According to Kothari (2014) the conceptual framework explains the relationship between the independent variables and the dependent variables. The former is presumed to be the cause of the changes while the former influences the latter. It helps the researcher see the proposed relationship between the variables easily and quickly. It is a pictorial representation where, descriptive categories are systematically placed in a broad structure of explicit propositions, statements or relationships between two or more empirical properties to be accepted or rejected. Potentially, one of the most powerful aspects of the Framework is that it provides a concise way of explaining the influence of independent variables on the dependent variable.



**Figure 2.1: Conceptual Framework**



### **2.3.1 Freight Management**

Fernando, Sharon, Wahyuni-Td, and Tundys (2017) opine that freight management involves the activities involved in shipping any goods or finished products from suppliers to a facility or to warehouses and sales locations. Transport system is the most important economic activity among the components of business logistics systems. Transport system makes goods and products movable and provides timely and regional efficacy to promote value-added under the least cost principle. Transport affects the results of logistics activities and, of course, it influences production and sale. In the logistics system, transportation cost could be regarded as a restriction of the objective market (Hong, Xu, Liu, Wu & Pu, 2021). Value of transportation varies with different industries. For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low-valued products, transportation occupies a very big part of sale and affects profits more, and therefore it is more regarded (Crujssen, Cools & Dollaert, 2013).

Transportation plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. It is the planning of all these functions and sub-functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics. The system, once put in place, must be effectively managed (Öz & Özyörük, 2021). The role that transportation plays in logistics system is more complex than carrying goods for the proprietors. Its complexity can take effect only through highly quality management. By means of well-handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands (Hong *et al.*, 2021). It brings efficacy, and also it builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness (Lau & Goh, 2014).

The manufacturing industry plays a pivotal role in global freight, offering cost-effective and high-capacity transportation options for consumers. This positions it as a crucial player in

the shipment of specific commodities like crude oil and grains. However, it does come with the drawback of longer transit times and susceptibility to weather-related disruptions (Ljungberg & Gebresenbet, 2014). In order to cut expenses and bolster competitiveness, contemporary manufacturing logistics companies lean towards employing large-scale vessels and collaborative operational methods. Furthermore, present-day manufacturing clientele place a higher premium on service quality over delivery costs. Hence, there is a need to foster innovative logistics approaches that amplify service satisfaction, including real-time updates, precise scheduling, and advanced tracking systems for goods (McKinnon et al., 2015).

Freight management is necessary for many industries and services to complete their supply chain and functions. It provides the delivery with speed, lower risk of damage, security, flexibility, accessibility and good frequency for regular destinations, yet the disadvantage is high delivery fee (Fernando & Tew, 2016). Novack and Thomas (2014) said air freight logistics is selected ‘when the value per unit weight of shipments is relatively high and the speed of delivery is an important factor’. The characteristics of air freight logistics are that: airplanes and airports are separated. Therefore, the industries only need to prepare planes for operation; it allows speeding delivery at far destinations; air freight transport is not affected by landforms (Yin *et al.*, 2021).

Road freight transport has advantages as cheaper investment funds, high accessibility, mobility and availability. Its disadvantages are low capacity, lower safety, and slow speed. The advantages of pipeline transport are high capacity, less effect by weather conditions, cheaper operation fee, and continuous conveyance; the disadvantages are expensive infrastructures, harder supervision, goods specialization, and regular maintenance needs (Sanchez-Rodrigues et al., 2015). Around one third to two thirds of the expenses of enterprises’ logistics costs are spent on transportation. According to Gruchmann, Pratt, Eiten, and Melkonyan (2020), the cost of transportation, on average, accounts for 6.5% of market revenue and 44% of logistics costs.

### **2.3.2 Logistics Information System Management**

In today 's competitive environment, effective and timely responses to ever-changing customer tastes and preferences have become essential components for successful business performance (Mohd, Nadarajan, Ibrahim, & Mustapha, 2017). In achieving performance, logistics information system comes in handy. According to Chang, Chiang and Pai (2012) logistics information system was defined as the flow of data in different directions with variable contents between various data base (department) within a company. Before, the logistics information system within the logistics had become vital since it enabled chains to respond on real time and accurate data (Huang, Dong, Kuang, Jiang, Lee, & Wang, 2021)). Firms then, looked at logistics information system as an asset, since it was not possible to have efficient and reliable materials flow without it.

Aggarwal and Singh (2019) concurred that, the flow of accurate and real time information in logistics was considered very important to the flow of materials. This logistics information system explosion had enabled logistics to become an important weapon in the firm's arsenal to add value to the bottom line (Tao et al., 2017). Information sharing was a key to success of logistics performance. In his study, Radicic (2019) confirmed that logistics information system had become an important element that reflected collaboration within the logistics management and firm performance. Sharing of information on transfer; exchange of information indicating the level and position of inventory; sales data and information on the forecasting; information about the status of orders, production schedules and delivery capacity, and firm performance measures had become essential to all firms (Wardaya, *et al.*, 2013).

Horzela, Kolinski, Domanski and Osmolski (2018) named four reasons why timely and accurate logistics information system had become more critical for effective logistics systems' design and operations: Customers perceived information about order status, product availability, delivery schedule, shipment tracking, and invoices as necessary elements of total customer service. With the goal of reducing total supply chain assets, managers realized that information could be used to reduce inventory and human resource requirements; logistics information system increased flexibility with regard to how, when, and where

resources may be utilized to gain strategic advantage; Enhanced information transfer and exchange capability utilizing the internet was changing between buyers and sellers and redefining the channel relationships (Fredriksson, Janné, & Rudberg, 2021).

However, this logistics information system can only be successful when firms impress on information technology use. Information technology provides the capacity to see data that is private in a system of cooperation and monitor the development of products, where information is passing in every process in the supply chain (Tao et al., 2017). According to Ketokivi and Schroeder (2014), it has been widely accepted that firms can achieve competitive advantage by cost reduction or differentiation with the proper implementation of IT. Radicic (2019) agrees with Porter and Millar that enabled by IT, logistics has become a source of competitive advantage for many firms.

Provision of information requested by customers had shown a decrease in the cost of inventory in supply chain and when the information flowed it had priority over the flow of products and materials (Fredriksson et al., 2021). Systems for order entry, order processing, electronic data interchange (EDI), vehicle routing and scheduling, and inventory replenishment were examples of early applications (Niemann, Meyer, Kotzé & Odendaal, 2018). Advanced information system was vital to ensure that the managers had the timely information necessary to cope with growing changes in the processes and product design to fulfill the customer requirements and managed these tasks effectively.

### **2.3.3 Customer Relations Management**

Organizations are obliged to create strong relationship with the customers, whether it is in service industry or in manufacturing industry. According to the service management literature, customer satisfaction is the result of a customer's perception of the service quality relative to the expectation (Mehmann & Teuteberg, 2016). Moreover, the authors define customer satisfaction as the customer's feeling regarding the gap between his or her expectations towards a company, product or service and the perceived performance of the company, product or service. Both the service management and marketing literature suggest that there is a strong relationship between customer satisfaction, customer behavioral

intentions (for example, switching and word-of-mouth) and, in turn, profitability (Gautam et al., 2019).

The customer relationship management team is vital in determining the amount of flexibility required in order to satisfy the customer. By evaluating their input, management should be able to determine the desired degree of manufacturing flexibility that is desired. Communications with other members of the supply chain are coordinated through the customer relationship management and supplier relationship management processes (Schramm, Czaja, Dittrich & Mentschel, 2019). Customer relationship management is a strategic management of the relationships between customers and business processes. It uses technology to management, automation and making business process simultaneously. The benefits of customer relationship management (Huang, Tu, Chao & Jin, 2019): To increase sales; to better understand customer demands; to understand that customers are profitable; customer satisfaction and reputation of the organization; and to reduce marketing costs (Dircksen & Magnin, 2017).

One concern of business is the customer satisfaction and contentment (Tien, Anh, & Thuc, 2019). Best customer service will be formed in an efficient and effective manner with information such as order status, product availability, delivery scheduling and billings. Therefore, the importance of information in the field of customer service and their satisfaction and contentment is clear. Therefore, the main purpose of the activities related to the supply chain is satisfying customer demand, so that they can deliver a product with a maximum quality and a minimum cost (Yang et al., 2019). When the kind of relationship between customer relationship management and supply chain management is defined precisely, then the actual performance of customer relationship management in the supply chain can be observed. Customer relationship management system is based on three fundamental variables such as engineering, economics and customer psychology (Schönsleben, 2018).

Customer relationship management systems automate many tasks and activities associated with providing service to existing customers and attract new customers. These systems track and record customer buying patterns and provides the customers with a faster access to the

data through integrating relevant data to customers with sales and service units. Customer relationship management can also increase customer satisfaction and it has a positive effect on them and their preservation. However, to achieve this purpose alone would not be possible without information systems and information technology (Tao et al., 2019).

Tilokavichai, Sophatsathit and Chandrachai (2012) conceptualize Customer Relations Management (CRM) beyond a front office contact management system. For others, CRM goes further, to constitute operational, analytical and collaborative elements (Wisner, 2010). Holistic approaches to CRM help organizations co-ordinate and effectively maintain the growth of disparate customer contact points or channels of communication. However, problems of channel conflict have been identified whereby customer experiences differ depending on the sales channel performance. Many organizations in this field have few alternatives but to outsource a significant proportion of their CRM solution as they lack the resources to develop CRM software. In logistic companies outsourcing is quite common. According to Loots (2017) 60% of in-house CRM systems fail, thus showing the need to embrace fourth-party logistics providers to put such systems in place for better engagement with the customers.

Timing is also important, as developing CRM software in-house can be a lengthy process and there are rewards to those that can respond rapidly and appropriately. Narayanan and Raman (2014) estimate that there may be a tenfold difference between the most profitable customers and the average. The idea that a firm cannot have a profitable relationship with all customers, and the practice of targeting customers with a differentiated product or service, is already widespread in many financial services, e.g. banking, insurance, and credit cards. It is less established in many other business sectors such as manufacturing. One method for identifying customer groups is the notion of distinguishing between transaction and relationship customers. Transaction customers are highly volatile and have little loyalty other than that related to obtaining the best price. Relationship customers have far more potential for loyalty as they are often prepared to pay a premium price for a range of reliable goods or services (Taniguchi, Thompson & Yamada, 2013).

When relationship customers are sought they are less likely to defect, provided they continue to receive the quality service for which they became customers. Old customers who have developed a relationship with the firm are also more cost effective than new customers because they are already familiar with, and require far less persuasion to buy, the company's products or services. Ekeskär and Rudberg (2022) argue that for many organizations it would be beneficial to distinguish between the two types of customer and focus on relationship customers for different types from different angles. There are three different types of relationship customers: the top, middle and lower groups. The top group (top 10%) consists of customers with excellent loyalty and of high profitability for the organization (World Bank, 2019). CRM is needed to retain and offer them the best possible service in order to discourage them defecting to competitors. Middle group customers (the next 40-50%) are ones delivering good profits and who show good potential for future growth and loyalty towards the firm, its products and services. These are the customers who are probably selective and might give some of their business to other competitors.

The focus is generally targeted to use CRM for this type of middle group customers as they are the greatest source of potential growth and if persuaded effectively they can be converted into being top-end customers (Thru-logachantar & Zailani, 2012). Lower group relational customers (the bottom 40-50%) are those who are only marginally profitable. Some may have potential for growth but the expense and effort involved in targeting such numbers hinders the effectiveness of servicing existing relational customers in the top and middle groups. In logistic companies, it is noticeable that CRM is used to identify different types of group so as to consider the response required by different groups. But this depends on what managerial skills are applied as it is not common that all shall follow this practice as a rule. Transactional customers contribute either nothing or have an adverse effect on profitability. The consensus therefore is that CRM needs to identify transactional customers to help the firm respond appropriately (Ekeskär & Rudberg, 2022).

Logistic firms' customer relationship management is a comprehensive approach that promises to maximize relationships with all customers, including Internet "e-customers", distribution channel members, and suppliers. Getting to "know" each customer through data mining techniques and a customer-centric business strategy helps the organization to

proactively and consistently offer (and sell) more products and services with improved customer retention and loyalty over longer periods of time (Fu, 2017). Ahmed and Zhang (2021) refer to this as maximizing “lifetime customer share”, resulting in customer retention and customer profitability. On the other hand, advanced customer data analysis also allows a company to identify the customers it does not want to serve. Beside the technological advances, CRM initiatives represent a fundamental shift in emphasis from managing product portfolios to managing portfolios of customers, necessitating changes to business processes and people. As companies start to re-engineer themselves around customers, individual employees must also come to terms with changing business processes, organizational culture and, thus, the ways they view their customers and how they treat them. All the citations mentioned above are very relevant for logistic companies, as their service is highly competitive in nature, and unless CRM is applied the customers may move from one organization to another to achieve satisfaction (Jovčić, Průša, Dobrodolac, & Švadlenka, 2019).

CRM is important for organizations to identify whether their customer is satisfied or not and to get idea to satisfy them to increase their loyalty in long run. Similarly, CRM emphasizes that customer retention affects the company’s profitability because it is more efficient to maintain an existing customer relationship than create a new one (World Bank, 2018). Also, customer Relationship Management (CRM) systems can help organizations manage customer interactions more effectively. To achieve the CRM objective, there is a series of aspects involved: the processes through which the customer relates with the organization, according to Thompson, are: marketing, sales, and service; The human factor (people) with a key role within the CRM strategy, both on behalf of employees within the organization (who must be immersed in a cultural change) as of the customers; and the technology is what facilitates implementing the CRM strategy; thus, it is necessary to know which of these technologies are and how they favour the CRM strategy (Ahmed & Zhang, 2021).

Customer relationship management provides the structure for how the relationships with customers developed and maintained. Management identifies key customers and customer groups to be targeted as part of the firm’s business mission. The goal is to segment customers based on their value over time and increase customer loyalty by providing customized



products and services. Cross-functional customer teams tailor Product and Service Agreements (PSA) to meet the needs of key accounts and for segments of other customers. The PSAs specify levels of performance. The teams work with key customers to improve processes and eliminate demand variability and non-value-added activities. Performance reports are designed to measure the profitability of individual customers as well as the financial impact on the customer (World Bank, 2018).

### **2.3.4 Product Packaging**

Packaging is the science, art, and technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging also refers to the process of design, evaluation, and production of packages. Basic objectives of packaging include; physical protection, barrier protection, containment or agglomeration, information transmission, marketing, security anti-counterfeiting packaging and convenience portion control. Packaging can be divided in primary, secondary and tertiary type. Labeling is any written, electronic, or graphic communications on the packaging or on a separate but associated label (Haffer, 2018). Basic objectives of labeling are brand identification, providing the information and promotion. Labels on food products are intended for consumer information and help to identify, promote, inform and offer advice on the use of the products concerned, and where for instance a label is applied over a closure, providing security as a tamper evident feature.

Food labelling might refer to naming a product or the listing of ingredients. The key objective of a food label is to provide information for the consumer, help sell the product and assist the consumer in making comparable food choices (Achuora, Guyo, Arasa & Odhiambo, 2015). Packaging is the first point of contact with the brand for a consumer product (Ristovska, Kozuharov, & Petkovski, 2017). Packaging design an important issue in the growing use of packaging as a marketing tool for self-service, since approximately 73% of products are sold on a self-service bases at the point of sale. On average, urban supermarkets carry 50 000 items and the typical shopper passes 300 items per minute. The packaging must, therefore, perform many of the sales tasks, including making an overall favorable impression and helping influence impulsive purchasing. This is in contrast to the secondary function of packaging that is used for storage, shipping and supply chain that

consumers do not see but that is still necessary in the distribution of the product to trade (Haffer, 2018).

Gencer (2019) argue that FMCG are low involvement products, as consumers do not search extensively for information about the brands, evaluate their characteristics, or make a weighty decision on which brand to buy. Based on previous literature, four main packaging elements are argued to affect the consumer's purchase decision. These elements broadly fall into two categories: Visual elements consisting of colors, graphics, design size, shape and packaging. These attributes relate to the affective side of decision-making. The information elements relating to the contents provided and technologies used in the packaging, and more likely to address the cognitive side of decision-making, such as educating the customer and the overall image of the brand (Gencer, 2019).

The use of color is obvious and well- developed and can be effective because of strong brand associations. However, people in different cultures develop their own unique color affinity. Companies also use packaging attributes such as graphics that include layout and the use of powerful product photography, to create an image to help in attracting and sustaining attention. Borgström, Hertz, and Jensen (2021) findings on packaging imagery indicates that the effects of pictures on packaging are contingent on the product category, and may be specifically beneficial to those with high levels of experience because it was not possible to manipulate the level of experiential benefits (Fisher, 2010).

Ghoumrassi and Tigu (2018) argue that for low involvement products, marketing communications need to have a strong impact, particularly as images affect consumer decisions, making graphics and color crucial. For many consumers of low involvement, the packaging becomes the product, particularly because of impressions formed on initial contact. Grocery Manufacturers of America survey in 2018, 82.0% of American consumers 'frequently' considered the price of a product before making a final selection. In a research conducted by the United Kingdom Consumer's Association (2016) about factors influencing food purchases, 34.0% indicated 'price/value for money', 21.0% 'quality', 16.0% 'nutrition/how healthy', 12.0% 'family's/personal preference', 5.0% 'how quick/easy to

prepare', 4.0% 'how fattening it is', 3% 'brand name/label', 3.0% 'special diets for remedial reason' and 1.0% 'ethical/religion'.

In their study, when choosing a new product, the respondents were affected by 'advertisement' (39.0%), then by 'visual impact/ product appeal' (22.0%), 'brand or label information' (22.0%) and lastly by 'preparation time' (17.0%). A study conducted by Kenyon and Meixell on consumer perception of food packaging in Trinidad West Indies suggests that the 'information on food labels quality/type of packaging, brand name and visual impact are important packaging features. Most respondents believed that the type of packaging material could adversely affect the quality or performance of food products. Food labeling was an important factor influencing food choice. Although most respondents read the nutrition facts panel, some found it to be too time consuming to read or too complex to understand, while others indicated that the display information was too difficult to follow.

A study assessing consumer awareness and usage of food labels and influences on food buying behavior conducted by Sahay and Mohan (2016) for Indian consumer give a clear indication that label information is generally gender and age insensitive though its use assumes significance with the income levels, education and occupation of the consumers. Most lifestyle products such as breakfast cereals, readymade dressings etc. that would mostly be used by people who have relatively higher levels of income and education would pay more attention to various kinds of label information. The awareness regarding label information is dependent on the consumer's level of education, income and kind of occupation. Hence, it becomes the task of regulatory agencies to sensitize the consumers to availability and importance of such information. Just enforcing rules on the food processing/packaging companies is not sufficient until the buyer is not reading them let alone interpreting them (Makmor, Saludin, & Saad, 2019).

### **2.3.5 Performance of Food and Beverage Manufacturing Firms**

Johannessen (2020) define performance measurement as a crucial criterion for evaluating the competence and achievement of an organization. Xiande (2014) defined performance measurement as the process of quantifying action, where measurement is the process of quantification and action leads to performance. They emphasized the importance of

satisfying customer requirements with greater efficiency and effectiveness than the competitors. Here the effectiveness referred to the extent to which customer requirements were met, largely with the essence that customer was always right and the efficiency referred to the measurement as to how economically the firm 's resources were utilized (i.e. total output against total input) to provide a specific level of customer satisfaction (Islam & Zunders, 2013).

A survey done by OECD in 2019, revealed an array of factors that were responsible for the efficiency and cost structure of African logistics chain. They included: logistics cost and efficiency indicator; time indicators related to deliver goods; truck turnaround time; complexity indicators which measured the level of complexity in undertaking trade transactions and customer perception indicators (OECD, 2019; Sahay & Mohan, 2016).

Aziz, Memon and Ali (2020), study on manufacturing performance reveals that most of the researchers evaluating manufacturing performance share a common understanding that they need to have multiple performance measurement. Looking back on the evaluation of performance measurement before 1980s, the performance measurement process was mainly concentrated with cost accounting approach which consisted of financial key performance indexes such as return on investment, profit plus earning per share. However, focusing on the financial indicators alone had been exposed to the critics that other non-financial indicators which contributed towards firm performance had been neglected and only lead to short-term thinking (Job, Njihia, Maalu, & Iraki, 2020).

According to Hubner *et al.* (2013) performance refers to the way in which work is done. There can be a good performance or a poor one. Bolumole (2011) defined it as the process of quantifying the efficiency and effectiveness of an action or activity. The purpose of performance measurement is to find out whether things are going the right way and, if not, to find what the causes that generated a poor performance were. After this step, there have to be found solutions for improving performance. There are several reasons for measuring performance: for improving performance, for avoiding inconveniences before it's too late, for monitoring customer relations, for process and cost control and for maintaining quality (Alavi *et al.*, 2012).

The main instruments for assessing performance are performance indicators, also named key performance indicators. They are specific characteristics of the process which are measured in order to describe if the process is realized according to pre-established standards. The best way to use indicators is to compare process values with normal, standard values. If there are poor results, poor performance, in reality, improvements for the process have to be made. Indicators are used basically for comparison with expected values. They are the control system of the studied process (Bask, 2011). According to Eisenhardt and Martin (2010) firm performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment); market performance (sales, market share); and, customer satisfaction/value added.

Firm performance comprised the actual output or results of an organization as measured against its intended outputs (or goals and objectives), it involved the recurring activities to establish organizational goals, monitor progress toward the goals, and adjust achieve those goals more effectively and efficiently (Hertz, *et al.*, 2013). According to Kaynak (2010) supply chain performance is optimized only when an “inter-organizational, inter-functional” strategic approach is adopted by all chain partners. Such an approach maximizes the supply chain surplus available for sharing by all supply chain members. Kwai-Sang *et al.* (2014) proposed a schema for future supply chain research that included transportation and logistics capabilities as the link between supply chain structure and performance. While Owano (2013) hypothesized a positive link between logistics strategy and organizational performance, he did not report data collection related to logistics strategy measurement and did not report results related to his hypotheses. Parkhe (2013) assessed the relationship between logistics quality and the organizational performance of firms in the retail sector.

Saliba (2013) hypothesized supply chain management strategy as a positive predictor of firm performance. Justification for the hypothesis was based on the argument that performance evaluation of the purchasing and supply management functions will become closely linked to measures of organizational performance such as growth, profitability, and market share. After surveying senior supply and materials management professionals in the USA, Fisher (2010) concluded that supply chain management practices positively impact firm performance. Lieb *et al.* (2013) surveyed CEOs of firms in the office and residential furniture

industry to assess the relationships among supply chain flexibility measures of product, volume, launch, access and target market flexibility, and measures of overall firm performance. They found volume flexibility to be positively correlated with all measures of performance.

Frost *et al.* (2014) collected data from 101 senior managers of US manufacturing firms to assess the relationship between supply chain management factors and firm performance measures. They found that the supply chain characteristics factor was negatively correlated with average selling price and positively correlated with overall product quality and overall customer service levels. Hendricks *et al.* (2013) surveyed sales managers for manufacturing firms and found positive links between supply chain management strategy and both marketing and financial performance.

Although no empirically tested measure of supply chain performance was found, logistics performance focuses outside the manufacturing function on the manufacturer/customer relationship, and, as Hirakubo *et al.* (2011) describes it, logistics performance reflects supply chain superiority. Harrison, Skipworth, van Hoek, and Aitken (2019) contends that logistics service providers work to integrate “business flow, physical flow, money flow, and information flow in the supply chain.” Such integration serves to strengthen the supply chain’s overall ability to deliver value to the ultimate customer.

Liu, Shi, Xue and Wang (2019) define performance measurement as the process of quantifying action, where measurement is the process of quantification and action leads to performance. The importance of satisfying customer requirements with greater efficiency and effectiveness than the competitors is highly emphasized. Effectiveness refers to the extent to which customer requirements are met, largely with the essence that customer is always right and the efficiency referred to the measurement as to how economically the firm’s resources are utilized (for example, total output against total input) to provide a specific level of customer satisfaction (Lu, Feng, Gao, Bi, & Wang, 2020).

### **2.3.6 Internal Policy Framework**

Internal policy framework in today 's highly competitive environment is appropriate for enhancing the organizational performance and effectiveness of organizational processes. Many companies are striving to gain a share of the global market and to take advantage of higher production and sourcing efficiency, but this mainly depends on the internal policy framework set by the company in regard to supply chain processes. A key determinant of business performance nowadays is the role of internal policies framework functions in ensuring the smooth flow of materials, products and information throughout the company's supply chain (Tracey & Tan, 2013). Due to the trend of nationalization and globalization in recent decades, the importance of internal policies in logistics has been growing in various areas. For firms, internal policies help logistics processes to optimize the existing production and distribution processes based on the same resources through management techniques for promoting the efficiency and competitiveness of enterprises. Policy framework plays an important role of adding competitive advantage to a firm in customer support and business excellence (Agyabeng-Mensah *et al.*, 2020). Effective policy framework in logistics processes provides the right product in the right place at the right time that is why it has received much attention over the past decade from practitioners and government (Tilokavichai *et al.*, 2011).

Realizing the importance of internal policies is critical for competitive advantage because operational performance has a positive impact on company's financial performance (Buyukozkan, *et al.*, 2015). In their study Finch (2014) confirmed that, due to increasing awareness of logistics management implications in firm performance and growing awareness of the benefits of leveraging logistics through proper internal policy framework to increase customer value, measuring of performance of logistics had become a high priority.

According to Lai *et al.* (2012), there were at least three basic reasons why a firm would want to measure logistics performance: firms could reduce operating costs, use these measures to drive revenue growth, and hence enhance shareholder value. He continued to say, by measuring operating costs through properly aligned internal logistics policies, a researcher

could identify whether, when and where to make operational changes to control expenses and very importantly, point out areas for improved asset management. Even valuable customers could be attracted and retained by improving the price value relationship of products offered through cost reductions and service improvements. Finally, returns to stockholder investments and the market value of the firm could have been significantly impacted by logistics performance improvements working through the processes that led to share price and dividend policy (Mathenge *et al.*, 2011). This study has therefore considered internal policy framework on logistics as a moderating variable to fourth party logistics on influencing firm performance.

The support functionality of logistics and other supply chain processes, there is need for manufacturing companies to have proper internal management policies and appropriate; level of control where they capture their respective processes on supply chain activities such as warehousing, materials handling, and packaging (Parkhe, 2013). These functions require a well-functioning internal framework of the firm; hence their effectiveness will be determined by how well the company is organized in terms of policies and roles by the internal operating parties (Sahay, *et al.*, 2016). Internal policy framework was deemed appropriate as a moderator since it determines whether a company has policies that support fourth party logistics or they lack such policies. When a company has no profound policies to guide its outsourcing for the fourth party logistics providers, it implies that the fourth party logistics may not be appropriately utilized to enhance the effectiveness of the supply chain and logistics processes for enhanced performance.

## **2.4 Empirical Review**

This sub-section reviews previous studies on fourth party logistics services and firm performance. Empirical review in a study is the systematic analysis of a study that relates to the study at hand in order to gain a deeper understanding of the study problem and how other authors perceive the problem thus providing a framework for answering the research problem. Through empirical review, research gaps are obtained. There are a few studies illustrating the influence of fourth party logistics service providers on performance of food and beverage manufacturing firms. Williams (2012) observed that manufacturing firms are



faced with the challenge of meeting high performance targets while using meagre resources to deliver effective and efficient services demanded by the stakeholders.

#### **2.4.1 Freight Management and Firm Performance**

According to Majid *et al.* (2019), there are four key stakeholders involved in urban freight transport: shippers; freight carriers; residents; and administrators/governments. Each group has its own specific objectives and tends to behave in a different manner and needs to be considered. Freight carriers and administrators are the media of the delivery tasks. The characteristic of their relationships is that a slight move in one part may affect the whole situation. For instance, a freight carrier with lower efficiency would impact on the service quality of the system and hence increase the difficulties of management for administrators. Besides, it would also reduce the satisfaction level of consumers and the reliability of firms and increase the operation cost.

Alnahhal, Tabash, and Ahrens (2021) consider that there are three necessary targets that could be achieved by applying City Logistics: mobility; sustainability; live ability. Mobility is ease of movement, which is the basic requirement for transport of commodities in urban areas. Goods are supposed to be delivered Just-In-Time. Therefore, the balance between sufficient road network capacity and reduced traffic congestion is a main issue. Concerning sustainability, which is more and more important, environmental issues and energy conservation would need to be considered. Live ability should be thought of for the residents. It involves an assessment of the conditions that are experienced and interpreted within an individual's life area, such as safety, peacefulness, attractiveness and charm.

Transportation occupied one-third to two thirds of the amount in the logistics costs hence transport management influenced the performance of logistics system immensely (Min, Meng, Chu, & Wang, 2020). Transporting is required in the whole production procedures, from manufacturing to delivery to the final consumers and returns. Only a good management and coordination between each component would bring the benefits of logistics to a maximum. A good transport management in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality on firms (Ji, 2021).

Zhang et al. (2022) discuss the importance of a supply chain focus on the part of transport logistics service providers as they function to link suppliers, manufacturers, sellers, and customers throughout the supply chain. They argue that transport logistics service providers must focus on supply chain performance in addition to organizational performance. Arkhipov, Wu, Wu, and Regan (2020) examine the perfect order, which comprises four main factors, namely: Delivered on time (orders that arrive upon agreed time between the stakeholders at the correct location); shipped complete (orders which are called off with all units and lines, i.e. in full); shipped damage free (shipped in correct condition); and correct documentation (orders received by customer of which are accurate in terms of required documentation including invoicing). By focusing on perfect order performance, one can foresee operational efficiencies, increased sales and market share and conclusively growth in the bottom line. One should however pay attention to, that achieving the perfect order isn't easy. If every single factor achieves a score of 95 %, the overall percentage is only 81.4 % (Grover & Malhotra, 2013).

In Kenya, Musau, Namusonge, Makokha, and Ngeno (2017) analysed the effect of freight management on organizational performance. Their study focused on textile manufacturing firms in Kenya. The study utilized a descriptive research approach and collected data using a questionnaire. The findings revealed that the management of freight was an integral way of enhancing organizational performance. According to Musau *et al.* (2017), through continued management of freight whereby the organization is aware of all its freight, it becomes more effective to oversee the progress of their freight, thus saving on costs and enhancing customer satisfaction.

Muhalia, Ngugi, and Moronge (2021) assessed the effect of transportation management systems on supply chain performance among firms in Kenya. The study focused on First Moving Consumer Goods (FMCG) companies in Kenya. The study utilized a descriptive research design and collected data using a questionnaire. The findings revealed that transportation management systems such as management of freight play an integral role in enhancing supply chain performance. According to Muhalia *et al.* (2021), through efficient management of freight, it makes the movement of goods more seamless. This saves on costs and time of delivering customer orders for enhanced customer satisfaction.

## 2.4.2 Logistics Information System Management and Firm Performance

The successful integration of information within an organization is a powerful enabler for reduced costs; increased productivity; and improved customer service, Logistics planning and operations has been an early and extensive adopter of information technology advances due to its dependency on information for efficient operations (Wisner, 2010). Systems for order entry, order processing, electronic data interchange (EDI), vehicle routing and scheduling, and inventory replenishment are examples of early applications, (Öz & Özyörük, 2021). Effective information technology (IT) has become absolutely necessary to support logistics processes, (Samson, 2012). By automating many routine logistics activities, IT has enabled managers to focus on strategic issues and core competencies and supported the use of intermediate supply chain activities, such as distribution (Hameed *et al.*, 2021).

Logistics Information System is a computer-based information system (IS) that supports all aspects of logistics management including the coordination and management of various activities such as; fleet scheduling, inventory replenishment and flow planning (Huang *et al.*, 2021). Instead of using human analysis and relying on the accumulated experience of people, LIS supports various automated decision-making processes that produce fewer human errors and lower costs as well as more accurate results, hence increasing the overall profitability and operational efficiency of logistics management (Bauknight *et al.*, 2015).

Aggarwal and Singh (2019) addressed a heuristics model to solve forward-reserve allocation problems within the order picking system. This was found to have a positive significant effect on logistics management and firm performance. Alavi *et al.* (2012) introduced an efficient optimization-based heuristics model based on the real-time information to support the decision-making process of a freight transportation network which resulted in improvement of logistics management and performance of retail firms. With the perceived benefits of using LIS in the support of logistics daily operations, seven kinds of LIS are widely applied in the logistics industry: load planning system (LPS); terminal management system (TeMS); vendor selection system; warehouse management system (WMS); financial management system; electronic Customer Relationship Management; and transportation management system (TMS) (Fredriksson *et al.*, 2021).

With good communication of information and cooperation along the supply chain, LIS enables the combination of operational and information flow, which provides transparent, networks for suppliers and customers thus creating effective logistics management. According to Niemann *et al.* (2018), LIS increases supply chain increased through collaboration among supply chain members via real-time data sharing and enhance time-based delivery thus increasing firm performance.

With sufficient information and with increased communication between various logistics operations and shareholders, different parties along the supply chain can promptly make appropriate decisions which in turn improve efficiency in logistics management. Thus Panigrahi *et al.* (2018) established a moderating effect of logistics information system on relationship between logistics management and firm performance. In fact, the recent advanced developed ICT such as RFID, GPRS, wireless mesh network and smart sensors are able to provide real-time tracking information on moving objects such that logistics firms can enhance their logistics management through improved accuracy in delivery and tracking ability (Walton, 2010). The successful integration of information within an organization is a powerful enabler for reduced costs; increased productivity; and improved customer service.

Salome, Wainaina, Kinoti, and Odock (2021) addressed the role of logistics information systems on the continued organizational performance among manufacturing firms in Kenya. The study addressed the role played by database and inventory management on the performance of the manufacturing firms. Using a descriptive research design, the authors collected data using a structured questionnaire. The findings revealed that through logistics information systems, the organizations were able to align their logistics processes to enhance the efficiency of their operations. Salome, Wainaina, Kinoti, and Odock (2021) further noted that through database and inventory management, the organizations were able to have a more seamless supply chain process for enhanced performance.

### **2.4.3 Customer Relations Management and Firm Performance**

Foltean, Trif, and Tuleu (2019) allude that the aim of CRM is to obtain a higher rate of customer retention and improve a company's market share and profits. Many scholars and service marketers have explored consumers' cognitive and affective responses to the

perception of service attributes in order to benefit by providing what consumers need in an effective and efficient manner. Both researchers and practitioners give high importance of CRM, because, a high degree of customer satisfaction can lead to customer retention and increased market share (Ekeskär & Rudberg, 2022).

Fabbe-Costes *et al.* (2014) attempted to link certain supply chain management practices with firm performance. In particular, they examined the effects of quality management, supply base management and customer relations practices on firm financial performance. They found that some aspects of quality management use of performance data in quality management, management commitment to quality, involvement of quality department, and social responsibility of management all were positively related to firm performance.

Gencer (2019) studied the effect of customer relationship management based on information technology on effective sales. The two companies have collected data and the results of positive impact on sales performance are reported. Haffer (2018) have researched on the integration of customer relationship management for the effective implementation of customer relationship management in small and medium organizations. Majid *et al.* (2019) have examined the effect of customer relationship management on the supply chain management. They concluded that if the customer relationship management is applied in the organization, everything will be written and recorded and everyone knows his/her job because they have common goals.

Study conducted by Wardaya (2013) regarding the relationships of Personality, satisfaction, image, ambience, and loyalty in the hotel industry found that Satisfaction has a significant impact on hotel image and guests' loyalty. Alnahhal *et al.* (2021) mention satisfaction is not a core element of customer loyalty but it is difficult to entertain loyalty development without satisfaction especially after loyalty has been established.

Dewnarain, Ramkissoon, and Mavondo (2019) agree that for satisfaction to affect loyalty, frequent or cumulative satisfaction is required so that individual satisfaction episodes become aggregated or blended. Moreover, it is clear, that he showed strong relationship between customer satisfaction and customer loyalty where, satisfaction is the basic element to determine customer loyalty.

Dewnarain *et al.* (2019) have a strategic role expected out of CRM, while they stress that CRM has a role in attracting new customers, it has a lot to do with developing closer relationships with these customers to turn them into loyal customers to the organization in long term. As such, Berry proposed that CRM might mean attracting, maintaining and enhancing customer relationships. Foltean *et al.* (2019) have expected CRM to build a cooperative relationship with the marketing organization. Few others have focused on the select set of customers for an organization on the basis of their business volumes and criticality towards the marketing activity, with an emphasis on identifying and managing a relation with them for continued profitability of the organization.

Kairui, Wairimu, and Ouma (2021) addressed the role of customer relations management as an outsourced function of logistics on the performance of service industry in Kenya. The study analysed the role played by the management of customer needs through supply chain outsourcing on the performance of service firms in Kenya. Through a descriptive research approach, the study collected data from line managers using a structured questionnaire. The findings revealed that customer relations management was instrumental in enhancing organizational performance by making it more effective for the organizations to meet customer needs and strengthen customer satisfaction. According to Kairui, Wairimu, and Ouma (2021), supply chain is about making the customers satisfied by delivering their goods on time and in good state. This serves to bring a more robust customer base that is satisfied with the operations of the firm.

#### **2.4.4 Product Packaging and Firm Performance**

Packaging now is regarded as an essential component of our modern lifestyle and the way business is organized. Packaging is the enclosing of a physical object, typically a product that is offered for sale. It is the process of preparing items of equipment for transportation and storage and which embraces preservation, identification and packaging of products. According to Gautam (2019) Packaging is the act of containing, protecting and presenting the contents through the long chain of production, handling and transportation to their destinations in as good a state, as they were, at the time of production Packaging is an

important part of the branding process as it plays a role in communicating the image and identity of a company.

Due to increasing self-service and changing consumers' lifestyle the interest in package as a tool of sales promotion and stimulator of impulsive buying behavior is growing increasingly. So, packaging has an important role in marketing communications, especially from the point of sales and could be treated as one of the most important factors influencing Consumer's purchase decision (Sahay & Mohan, 2016). Consequently, the role of package in marketing communications increases: it must attract consumer's attention and transmit adequate value of product to consumer in the short period right in the place of sale. Therefore, there is a necessity to explore package and its elements in more detail, in order to understand which of these elements are the most important for consumer's purchase decision.

On the other hand, Rao *et al.* (2015), argue that there are four important functions for packaging, and the current study focuses on these functions, to study the role of packaging in Jordanian consumer's perception of product quality at the point of purchase. These four dimensions include all kolters' dimensions but in other names, these dimensions are: Protection of products and consumer, Promotion of products, Facilitation of storage, use, and convenience of products and Facilitation of recycling and reducing environmental damage. Protection of products and consumer; A package protects the contents as the product moves through its marketing channel and while it is in use. A packaging also prolongs the shelf life of a product, which is important to producers, middlemen, and final buyers. Increasing attention focused recently on package safety, especially for drugs, household cleaners, and other products that are potentially dangerous, particularly to children (Peck, 2015).

Product safety is an underlying dimension of perceived product quality, is composed of such a vast number of components that it would verge on vagueness to consider it only in general terms. Indeed, a product can be perceived as being need satisfying, hence fulfilling part of the notion of "product quality", for example, a food product may be very delicious (generally accepted as constituting quality), but may be thought to contain artificial additives that are

harmful to the consumer (Ghosh, 2019; Panayidis, 2013). Protection of the product should be effective in reducing damage that could influence its usefulness and increase costs. Packages protect from breakage, evaporation, spillage, spoilage, light, heat, cold, and many other conditions. Packaging often plays an important functional role, such as protection, or storage of product.

Consumer protection is becoming a growing role of packaging. Packaging that fails to fully protect the product has the potential to result in excess damage and waste, diminished shelf life, and loss of flavor or efficacy. Problems associated with insufficient protection are likely to lead to customer dissatisfaction (Harrison et al., 2019). The protection accorded to the contents by the package must be available at the following stages during the life span of the product: at the end of the product line inside the plant; during storage and handling; during transportation; during storage at the distribution or retailer's warehouse; and during the consumption process in the consumer's home.

Promotion of products; the promotional role of a packaging should be considered. It can be used to attract customers' attention and encourage them to examine the product. Packaging design is critical in supermarket products, where its most important function is to help differentiate the products and consumer spend less time planning the shopping trip and reading than ever, visual images are crucial to attracting them. Promoting the contents is an important packaging objective, especially in self-service retailing (Novack *et al.*, 2014).

Package must serve as a silent salesperson and attract the shopper's attention. Packaging is becoming an increasingly important aspect of marketing strategy. Companies are seeing packaging as a way to attract customers to new and existing brands. Packages use design, colors, shapes, pictures, and materials to try to influence consumer's perceptions and buying behavior (Gautam *et al.*, 2019). Facilitation of storage, use, and convenience of products. A major benefit of packaging is the information on it conveyed to the consumer, such as directions on how to use the product and the composition of the product, which is needed to satisfy legal requirements of product disclosure. Packaging convenience is defined by how consumers use the package. Simply put, convenience in packaging starts with a package that is easy to open as well as easy to close (Narayanan, 2014).



Consumers' requirements for storage, use, and convenience cover, Consumers are constantly seeking items that are easy to handle, open, and reclose, although some consumers want packages that are tamperproof or childproof, also want reusable and disposable packages (Huang et al., 2019). Surveys conducted by sales and marketing management magazine revealed that consumers dislike-and avoid buying-leaky ice cream boxes, overly heavy or fat vinegar bottles, immovable pry-up lids on glass bottles, key-opener sardine cans, and hard-to-pour cereal boxes. Attractiveness, convenience, and economy are some aspects of a product's utility to final buyers. Reuse packaging means the package can serve other purposes after the contents have been consumed (Kulkarni et al., 2010).

A major goal of reuse packaging is to stimulate repurchases. Convenience is another function of packaging that consumers often look for at the point of purchase, the size or shape of a package may relate to the product's storage, convenience of use, or replacement rate. Defining convenience in flexible packaging is essential to fully leveraging all of its benefits and ensuring long-lasting consumer-brand relationships. Flexible packaging offers many advantages to consumer, product, and to companies. Flexible packaging can be effective in helping brand owners build a close relationship with consumers. For consumers, convenience is even more critical serving that draws an initial sale and retains consumer brand loyalty (Liu *et al.*, 2019).

Kamau, Makokha, and Pattasio (2022) did a study on the effect of product packaging as an outsourced service on the performance of manufacturing firms in Kenya. The study assessed the role played by the packaging materials, the descriptive labeling and the consistent branding on the performance of manufacturing firms. The study utilized a cross-sectional research approach and collected data from 378 respondents using a structured questionnaire. The findings revealed that through continued embrace of outsourcing product packaging, the manufacturing firms stood a better chance to steer their effectiveness and presence in the market. Moreover, Kamau, Makokha, and Pattasio (2022) noted that products packaging enabled the organizations to have a more profession packaging process that embraced consistent branding and descriptive labeling for more visible products in the market.

Clear and Consistent Branding

#### **2.4.5 Internal Policy Framework and Firm Performance**

Managing logistics require key policies and appropriate internal policy framework that provide the guidelines and operational approaches. It is the set of guidelines and regulations that a company puts internally to describe how its logistics processes and supply chain operations are to be carried out. An internal policy framework on logistics outlines the activities involved in movement of any goods or finished products from suppliers to a facility or to warehouses and sales locations (Muazu, 2019). It is included because it was a major part of the supply chain due to its power to add value to some goods by moving them from their current location to a more advantageous location. According to Atos (2019), internal logistics policy framework has been found to be a major factor in logistics processes as it ensures appropriate management of the logistics activities and how well they can be aligned to enhance performance.

Internal policy framework is essential in ensuring that the organization has a properly aligned set of guidelines to run its logistics and supply chain processes for effectiveness (Wang & Kim, 2017). Internal policy framework on logistics comprises of the planning, controlling and decision making on operational area of logistics that geographically moved and positioned inventory. Because of its fundamental importance, transportation had traditionally received considerable managerial attention and almost all enterprises, big and small, had managers responsible for transportation. Internal policy framework determines how well the logistics of an organization will be properly managed and run to achieve the effectiveness in customer satisfaction and cost-saving (Musau *et al.*, 2017).

Internal policy framework is required in the whole production procedures, from manufacturing to delivery to the final consumers and returns. Only a good management and coordination between each component would bring the benefits of logistics to a maximum. A good internal policy on logistics provides better logistics efficiency, reduce operation cost, and promote service quality on firms (Radicic, 2019). Obviously, a product has more value at a retail store than it did in a firm's warehouse, because in the retail store it is available for sale. At the store it could generate revenue, while in the warehouse it is simply sitting there waiting to be moved (Zhang *et al.*, 2019). This is where transportation added value to goods.

Whether the good was moved from the manufacturer to the warehouse and then to a retail store, straight from the manufacturer to the retail store, or simply from one warehouse to the next, the product became more valuable to the company as it moved closer to the end user. From the logistical system point of view, three factors were fundamental to transportation performance: cost, speed, and consistency (Aloo & Ongwae, 2021).

The internal policy framework on logistics is meant to provide the logistical system and structure that a company ought to follow during its supply chain processes. Logistical systems utilize transportation that minimized total system cost. According to Bauknight *et al.* (2015) speed of transportation was the time required to complete a specific movement. Speed and cost of transportation were related in two ways. First, transport firms capable of offering faster delivery typically charged higher rates for their services. Second, the faster the transportation service was, the shorter the time interval during which inventory were on transit and the higher the charges (Ahmed & Zhang, 2021). Thus, a critical aspect of selecting the most desirable method of transportation to a firm is to balance speed and cost of service.

Internal policy framework in logistics refers to variations in time required to perform a specific movement over a number of shipments and the aspects pointed out in the internal operational frameworks of the organizations. Consistency reflected the dependability of the system. For years, logistics managers had identified consistency as the most important attribute of quality logistics management (Kenyon & Meixell, 2011; Hong *et al.*, 2021). When internal policies in logistics lack consistency, inventory safety stocks are required to protect against service failure, impacting both the sellers and buyers overall inventory commitment. With the advent of advanced information technology to control and report shipment status, logistics managers had begun to seek faster movement while maintaining consistency. Speed and consistency combined to create the quality aspect of transportation (Aydin *et al.*, 2022).

In Africa, Periukao and Rashitau (2019) addressed the role played by internal policy framework on the effectiveness of organizational performance in Ghana. The authors indicate that when crafting an internal policy framework for logistics, it was imperative to

strike a delicate balance between transportation expenses and service quality. In certain scenarios, economical yet slower transportation sufficed (Periukao & Rashitau, 2019). Conversely, in other instances, swifter service was crucial for attaining operational objectives. The task of identifying and overseeing the optimal transportation blend throughout the supply chain fell squarely under the purview of logistics policy and governance. The efficiency of the internal policy framework hinged on how much value a company could derive relative to their available resources and willingness to invest. Ultimately, it is the management of logistics that facilitated the movement of company goods and products with reduced cost, enhanced speed, and unwavering reliability, ensuring the prompt and efficient delivery of firm-produced items (Chopra & Meindl, 2013).

Kinyua, Maluthe, and Kabatia (2021) addressed the role played the role-played internal policy framework on moderating the firm's ability to embrace their key strategies to steer performance. The study utilized a mixed method analysis and surveyed 291 firms using a semi-structured questionnaire and analysed using SPSS. The findings revealed that the internal policy framework determined the extent to which firms embraced key strategies to align their operations with the changing market for better performance. Further, Kinyua, Maluthe, and Kabatia (2021) noted that through continued integration of robust internal policies that make firms ore liberal in embracing new strategies, it becomes easier for firms to adopt to changes thus enhance their continued performance.

## **2.5 Critique of the Existing Literature**

Majid et al. (2019) concluded in their study on logistics and firm performance that customer-focused and information-focused logistics capabilities were the primary factors directly and indirectly influencing firm performance. However, their study primarily focused on capabilities and did not account for other crucial logistics factors like efficiency and effectiveness, which are key measures of firm performance. Additionally, the study did not address the relationship between logistics flexibility and dimensions of firm performance. This study aims to provide an exploratory characterization of logistics efficiency, effectiveness, and flexibility, and test hypotheses linking aspects of logistics management with firm performance.

Öz and Özyörük (2021) examined the relationship between logistics capabilities, logistics performance, and firm financial performance. Their results showed a positive direct influence of both logistics capability and performance on firm financial performance. However, this study did not take into consideration other factors affecting firm performance measurements, such as growth, market share, and customer satisfaction. Neglecting these variables could potentially lead to inaccurate results in assessing firm performance.

The study conducted by Hubner et al. (2013) focused on the use of communication tools like websites in industrial organizations to enhance value in supply chain relationships. They found that firms could effectively manage costs, provide high customer service, and excel in supply chain management even without the use of cutting-edge information technologies. However, both researchers did not factor in human participation in their research. Without understanding the users of information technology, the results could have been different. Many previous studies, including Lai & Cheng (2012), emphasized the importance of a supply chain focus for transport logistics service providers. These providers play a critical role in connecting suppliers, manufacturers, sellers, and customers in the supply chain. However, these studies predominantly concentrated on the broader concept of transport logistics and did not specifically address the context of fourth-party logistics. Freight logistics exhibit distinct features based on the level of logistics party involved. To bridge this gap, this present study centers on freight logistics within the context of fourth-party logistics.

Tan et al. (2011) and Grover (2013) attempted to link specific supply chain management practices with firm performance, particularly examining the effects of quality management, supply base management, and customer relations practices on firm financial performance. Nevertheless, these studies also primarily focused on the broader concept of customer relations management and did not delve into the context of fourth-party logistics.

Similarly, Frost (2014) linked logistics information system management to continuous improvement in firm performance, emphasizing the importance of robust logistics information system metrics. However, these metrics were not tailored to the context of fourth-party logistics and may not be as effective in this context. Ngonela et al. (2016)

asserted that logistics, including product packaging, has become crucial for organizations seeking competitive advantages. They highlighted the challenge of delivering the right packaging to the correct audience. However, their assertions were general and not specific to the context of fourth-party logistics or the manufacturing industry. The reviewed literature also examined the relationship between knowledge sharing and outsourcing success (Lee et al., 2013). However, these studies did not consider the potential moderating influence of governance and policy framework in the relationship between fourth-party logistics and firm performance, which is a focus of the present study.

## **2.6 Summary of Literature Reviewed**

Nowadays, there is increasing number of manufacturing firms focusing their efforts on their core competencies and outsourcing their logistics functions to one or more logistics providers. The extent to which a firm may effectively control an outsourced logistics business is determined by the information received and the early detection of problems (Gil-Gomez, Guerola-Navarro, Oltra-Badenes, & Lozano-Quilis, 2020). Fourth party logistics providers have a significant impact on not only the past and the present, but also the future because cost is a primary motivator and fourth party logistics has evolved into a strategic partner in firm's performance.

Fourth Party Logistics providers are not merely a means to make the supply chain operation effective and efficient, but also a strategic tool for creating competitive advantage through increased service and flexibility. To become successful in an intense competitive environment, fourth party logistics providers should device new strategies of resolving logistics problems by developing skills, competencies and value-added activities.

Nowadays, fourth party logistics s are putting more attention on building a long-term contractual relationship with their customers by providing lead time logistics services. In other parts of the world especially the developed countries a lot of research has been done in this area, but there is scanty literature in Kenya. Therefore, there is a need to conduct research in the outsourcing of fourth party logistics providers in Kenya to understand their benefits in the performance of manufacturing firms. Given the importance of fourth party

logistics and steady growth of the manufacturing sector in Kenya, there is need to establish the effect of fourth party logistics on performance of manufacturing firms in Kenya.

## **2.7 Research Gaps**

There were three major reasons driving this study; lack of empirical evidence on fourth party logistics management concept and performance link targeting manufacturing firms in Kenya, low performance by manufacturing firms 'in Kenya in terms of efficiency and competitiveness and finally the current literature largely focusing outside Africa (Grover & Malhotra, 2013). A review of the various studies shows that manufacturing firms seek different fourth party logistics; and the reasons why companies decide to outsource logistics services vary greatly. However, majority of the available studies have been conducted mostly in developed countries where companies have extensively adopted or hired logistics service providers on various logistics services. These include the study by Arkhipov *et al.* (2020) carried out in China, study by Fisher (2013) in United States of America, and a study by Ghoumrassi and Tigu (2018) in Netherlands. The fourth part logistics service in these countries may not face the same challenges as they do in a Kenyan context, where the logistics processes are not yet developed and advanced as it is for the developed countries. Fabbe-Costes *et al.* (2014) while assessing the role played by supply chain management practices focused on the need for customer relationship management and how it effectively contributes to overall firm performance. The study however was carried out in a different context and leaves out the concept of customer relationship management as far as fourth party logistics is concerned. Further, a study by Gautam (2019) focused on fourth party logistics in the context of developed countries. The first world such as Europe, America and part of Asia have more developed infrastructure and systems, thus fourth party logistics could work effectively in such countries as compared to the Kenyan systems. This shows the need for a local study to elaborate the essence of fourth party logistics in enhancing firm performance.

Jiang et al. (2021) addressed the need for fourth party logistics through product packaging and logistics information systems management. The study, however, focused on processing industry in China, which may not be duplicated to a Kenyan industry where the manufacturing industry is still developing and not as advanced as the one in China.

Moreover, a study by Dewnarain et al. (2019) addressed the need for customer relationship management through outsourcing logistics, but focused on the role played by the manufacturing entities to management customer relationships by outsourcing their core mandates. The current study, however, focused on customer relationship management as a function carried out by the fourth party logistics providers outsourced by the food and beverage manufacturing firms.

In a local context, Kairui et al. (2021) conducted a study examining the impact of logistics management practices on organizational performance in Kenya. The study did not point out on the essence of outsourcing customer relationship management function from the fourth party logistics service providers. Meanwhile, Mathenge (2011) found that manufacturing firms in Kenya tend to exhibit suboptimal performance in terms of operational efficiency and effectiveness, casting uncertainty on the sector's ability to align with Vision 2030 objectives. This underscores the need to explore innovative management approaches that can enhance firm performance in Kenya. Thus, this study introduces the concept of fourth-party logistics management with the aim of addressing performance challenges and supply chain issues faced by manufacturing firms in Kenya. Notably, none of the prior studies have investigated the influence of fourth-party logistics on supply chain performance within the steadily growing Kenyan manufacturing sector in recent years.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter explores the research techniques that were used in the study. It articulates the research design that was used, the population and sample targeted, as well as how data was collected subsequently analyzed. The chapter also provides the preliminary practices that were performed to ascertain reliability and validity of the research instrument as well as to ensure normality and linearity of the study findings.

#### **3.2 Research Design**

Research design refers to a detailed outline of how the overall strategy integrates the different components of the study in a coherent and logical way to effectively address the research problem. It is the plan on how to answer research questions (Saunders, 2019). This study adopted the descriptive-cross sectional research design using both quantitative and qualitative approaches. Descriptive research design allows the researcher to gather, summarize, present and interpret information for the purpose of clarification. It is mainstreamed to fact finding and may result in the formulation of important principles of knowledge and solution to significant problems. The cross-sectional design on the other hand enables the researcher to establish the relationship between two or more study variables, thus accommodating the regression model analysis. The cross-sectional research design as elaborated by Kothari (2019) enables the researcher to compare two or more variables at the same time, thus enabling the testing of hypotheses. This justifies the choice of the design to examine the relationship between fourth-party logistics providers and performance of food and beverage manufacturing firms in Kenya.

The combination of the two designs was considered essential since as much as one design (descriptive) provided numeric description of the population and described events as they were cross-sectional enabled comparison of the variables through inferential statistics. According to Creswell (2017), combining descriptive and cross-sectional research design

enables the researcher to describe events both qualitatively and quantitatively and at the same time compare how variables relate to each other through cross-sectional design.

### **3.2.1 Research Philosophy**

The study was informed by a positivism paradigm as the research philosophy. The paradigm uses a quantitative approach which involves data collection and the analysis of numerical data. Paradigms are the basic belief system that guides the investigation, not only in choices of methods but in ontologically and epistemologically fundamental ways (Saunders, 2019). They posit that epistemology is the branch of philosophy that studies knowledge (Christensen *et al.*, 2017). Epistemology is concerned with determination of the nature and extent of human knowledge and attempts to address the distinction of adequate and inadequate knowledge. There are two major philosophical schools of thought that guide research in social sciences that is; positivism and phenomenology. Using a positivism paradigm implies that the study can embrace a methodology that has both the qualitative and quantitative approaches of collection and analysis of data.

### **3.3 Target Population**

A population is the total of all the individuals or items that have certain characteristics which are of interest to a researcher. Sekaran and Bougie (2019) describe target population as a complete set of individual cases object with some common characteristics to which researchers want to generalize the result of the study. The target population of this study was 197 registered food and beverages manufacturing companies in Kenya as per KAM (2021). Food sector constitutes about 33% of the manufacturing sector in Kenya and the sector adds value to agricultural produce and therefore growth of this sector can have a direct significant impact on the whole Kenya's economy.

**Table 3.1: Distribution of Target Population**

<b>Location</b>	<b>Number of Manufacturing of Firms</b>	<b>Percentage %</b>
Nairobi	101	51.26
Mombasa	24	12.18
Thika	21	10.66
Kisumu	8	4.06
Nakuru	8	4.06
Eldoret	6	3.05
Kericho	3	1.52
Nyeri	3	1.52
Ruiru	3	1.52
Towns with < 3	20	10.15
<b>Total</b>	<b>197</b>	<b>100.00</b>

Source: KAM (2021)

### **3.4 Sampling Frame**

This frame defines a researcher's population of interest. A sampling frame is a list of all items where a representative sample is drawn for the purpose of research (Patron, 2012). In this study, the sampling frame was a list of all 197 registered food and beverages manufacturing companies in Kenya (KAM, 2021). These manufacturing firms are located in Nairobi, Mombasa, Kisumu, Thika, Nakuru, Eldoret, Kericho, Nyeri, Ruiru and other 16 towns with less than three firms. The sampling frame was obtained from the directory of Kenya Association of Manufacturers and exporter (KAM, 2019). The researcher used the head supply chain or the head of procurement from each of the food and beverages manufacturing companies who responded to issues concerning the influence of fourth party logistics on performance of firms.

### **3.5 Sampling Technique and Sample Size**

#### **3.5.1 Sampling Technique**

The study used stratified random sampling technique where the subjects were selected in such a way that the existing subgroups in the population are more or less reproduced in the sample (Kombo & Tromp, 2013). Dunn (2018) defines stratified random sampling as a method of sampling that involves the division of a population into smaller groups known as strata. In this study, food and beverages manufacturing companies from different locations formed strata and stratified random was used to select sample size from each stratum. This stratified random sampling technique guaranteed each stratum to be represented in the sample and was more accurate in reflecting the characteristics of the population.

#### **3.5.2 Sample Size**

A sample is a portion or part of the population of interest. Oso and Onen (2016), states that an ideal sample should be large enough so that the validity and reliability of the data is achieved. That is if the same study is conducted with different sample size same data was collected. Kasomo (2015), states that there is no exact size of the sample but these depend on the purpose of the study and the nature of the population under scrutiny. In general, though, the larger the sample the more reliable it is.

Where  $n$  is the sample size,  $N$  is the population (197) and  $\beta$  denotes the error, set at 0.05

$$N / \{1 + N (\beta^2)\} = n$$

$$197 / \{1 + 197(0.05^2)\} = 132$$

The equation gives sample size of 132 food and beverage manufacturing firms. Therefore, the study sought to gather information from 132 food and beverage manufacturing firms located in across the country, where the heads of procurement were used. This sample was deemed good representation of the populations since the sample size was greater than 10% of the target population. Creswell and Creswell (2017) argue that for a sample to be a good representative of the population it should be at least 10% of the target population.

This study used probability sampling since the population and location of food and beverage manufacturing firms is known. Specifically, the study used stratified random sampling in order to account for the uneven distribution of firms in various towns. Based on distribution of firms in the 10 towns (table 3.1), the researcher used proportions calculated in the population distribution to come up with a representative sample distribution as shown in table 3.2. The proportions calculated gave the number of firms to be included in the sample for each segment. Thereafter simple random sampling was used to select the names of food and beverage manufacturing firms in which data was collected concerning the influence of fourth party logistics on performance of firms.

**Table 3.2: Sample Size**

<b>Location</b>	<b>Population of Firms</b>	<b>Sample Size</b>	<b>Percentage %</b>
Nairobi	101	68	51.5
Mombasa	24	16	12.1
Thika	21	15	11.3
Kisumu	8	5	3.8
Nakuru	8	5	3.8
Eldoret	6	4	3.0
Kericho	3	2	1.5
Nyeri	3	2	1.5
Ruiru	3	2	1.5
Towns with < 3	20	13	9.9
<b>Total</b>	<b>197</b>	<b>132</b>	<b>100</b>

Source: KAM (2021)

### **3.6 Data Collection Instruments**

A questionnaire was used to collect primary data for the study. The questionnaire was developed to capture the various variables under study, and for the independent variables. A questionnaire is a research instrument that gathers data over a large sample and its objective

is to translate the research objectives into specific questions, and answers for each question provide the data for hypothesis testing (John & Johnson, 2012). The advantages of a questionnaire over other instruments include: information can be collected from large samples, no opportunity for bias since it is presented in paper form and confidentiality is upheld (Kothari, 2014). According to Saunders (2019), through use of a questionnaire, the researcher is able to provide a guidance on how to respond to the questions thus confining the respondents to the main thematic areas of the study. The questionnaire contained both closed and open-ended questions. The closed ended questions were aimed at giving precise information which minimized information bias and facilitate data analysis, while the open-ended questions gave respondents freedom to express themselves.

### **3.7 Pilot Study**

Pilot test refers to the preliminary study which in this study was conducted to evaluate feasibility and statistical variability in an attempt to predict an appropriate sample size and improve upon the study design prior to performance of a full-scale investigation. The aim of pilot study was to test the reliability of the questionnaires. According to George and Mallery (2013) a pilot test is necessary for testing the reliability of data collection instruments. Pilot study is thus conducted to detect weakness in design and instrumentation and to provide accurate data for selection of a sample (Patron, 2012). According to Chih-Pei and Chang (2017), 10% of the sample size should constitute the pilot test which should not be included in final study. Piloting of the research instrument means administering the instrument to a small representative sample identical to but not including the group one is going to survey. In this study, 10% of the sample size was 13 heads of procurement. Kothari (2014) contends that using between 5% and 10% of the sample size for the pilot study is adequate, while Saunders (2017) alludes that a 10% of the sample size is enough for a pilot study. This justifies the choice of 10% in this study.

#### **3.7.1 Reliability of Research Instruments**

Bobbert (2017) defines reliability as the precision and accuracy of a measurement procedure. In the present study, errors likely to affect reliability are interviewer/ interviewee fatigue, bias from the interviewer and inaccuracy of the instrument in use, inaccuracy in scoring by

the researcher and finally, unexplained errors whose source cannot be determined. In this regard, the study conducted a pilot study using 13 heads of procurement to pre-test the questionnaire prior to the main data collection exercise with a view to check for errors and test the tools for reliability. The study used the Cronbach Alpha Reliability coefficient value to test for internal consistency of the questionnaire. An alpha coefficient of 0.7 or higher indicates that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population. The questionnaire was modified based on the feedback from the pilot test and a final one developed in conformance with the threshold.

### **3.7.2 Validity of Research Instruments**

Validity is defined as the degree to which true differences among respondents being tested is reflected in differences found with a measuring tool reflect (Kasomo, 2011). Validity can be measured by the extent the data obtained accurately reflects the theoretical or conceptual concepts; that is if the measurements gotten are consistent with the expectations. In this study, three types of validity were tested. These include face validity, content validity and construct validity. Face validity was tested using expert's opinion drawn from the logistics and supply chain. The opinion of the experts was used to rate the face validity based on how well the questions used in the questionnaire were appropriate to answer to the research questions.

Content validity was assessed through review and verification of the extant literature for the items contained in the questionnaire. Construct validity was assessed from the correlation of items using Principal Component Analysis (PCA). There is construct validity and content validity. Construct validity was ascertained through the data that is collected from the pilot sample to find out whether the data collected is accurate and meaningfully represented in the theoretical concepts (Bauer, 2018).

### **3.8 Data Collection Procedures**

The study used the primary data and it was collected using questionnaires which were administered individually by the researcher with the help of research assistants to all

respondents. Care and control were exercised to ensure that most of the questionnaires issued to the respondents are received. To achieve this, a register of questionnaires was maintained showing the ones which are issued and the ones received. The questionnaire was administered using a drop and pick later method to the respondents. A research permit from the National Commission for Technology and Innovation (NACOSTI) was obtained as well as an authorization letter from the university. This was to introduce the respondent to the respondents thus support the aim of the data collected. The respondents were given two weeks to respond to the questionnaire and give it back to the researcher for analysis. Two trained research assistants were used to collect the data so as to make the process more seamless and effective.

### **3.9 Data Analysis and Presentation**

After data collection, screening was performed for the following; levels of measurements, sample size, assumptions of normality, linearity, independence of errors and homoscedasticity. Further screening was covered outlier detection and establishing presence of Multicollinearity. Testing for compliance with statistical assumptions of multivariate analysis provided a pillar for making statistical inferences and results (Kothari, 2014).

#### **3.9.1 Descriptive Statistics**

Descriptive statistics including frequencies, percentages, mean and standard deviations was used in data analysis. Descriptive statistics was utilized with a view to summarize, reduce data and analyze constructs and items. This form of analysis gave insights into the sample attributes. Descriptive statistics were further offer a basis for inferential statistics using multiple regressions and correlation.

#### **3.9.2 Diagnostic Tests**

Diagnostic tests are meant to ensure that the assumptions of the regression model are met in the data obtained in a study. The main assumptions of the regression model include: normal distribution of the data (normality), predictor variables are not strongly correlated (multicollinearity), the error terms are not exaggerated across the variables



(heteroscedasticity) and the data is not autocorrelated across the population (autocorrelation).

To check for normality this, study the normality was tested using the Shapiro-Wilk and Kolmogorov-Smirnov Tests for defining Skewness and Kurtosis to check for symmetry and peakedness of the distribution thereof. The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2013). Tests of normality help to confirm whether the data follows an asymmetrical or normal distribution (John & Johnson, 2012).

According to Dunn (2010), multicollinearity test is an evaluation of the level of correlation of the independent variables. In the present study, the Variance Inflation Factor (VIF) was used. Where  $VIF = 1 / (1 - R^2)$ ;  $R^2 =$  Coefficient of Determination. If any of the VIF is greater than 10, as a rule of thumb, multicollinearity is significantly large and consequently they are poorly estimated. Hence the variable was dropped from the model. If  $5 < VIF < 10$ , then multicollinearity is moderate, if  $5 < VIF$ , then Multicollinearity is insignificant

Homoscedasticity assumes that there is constant variance of the errors. Heteroscedasticity, which is a violation of homoscedasticity makes it problematic to measure the true forecast errors' standard deviation, and too narrow or too wide are usually the result. A plot of residuals versus predicted values was used to check for the convergence.

### **3.9.3 Inferential Analysis**

Multiple regression analysis is specifically preferred as it contained a model goodness of fit to show the percent of firm performance being attributed to the conceptualized study variables (Kothari, 2014). The 5% level of significance was compared with the p-value and significance of the predictor variables (freight management, logistics information system management, customer relations management, product Packaging and Internal policy framework) concluded if the latter is less than 5%. P-value is the exact lowest probability of rejecting the null hypothesis when it is true (Larry, 2013).

The coefficient of determination ( $R^2$ ) was used to rank explanatory variable's contribution to the response variable in an attempt to validate or invalidate the pecking order theory.  $R^2$

is the proportion of variation of the response variable that is explained by the variation of the predictor variable(s) and as such the higher it is the better (Neuman, 2017).

The multiple regression model was:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon \dots\dots\dots i$$

Where:

Y = Performance of Food and Beverage Manufacturing Firms

$\alpha$  is the y-intercept or model coefficient;

$\beta_1 - \beta_4$  = the coefficients of the independent variables;

$X_1$  = Freight Management

$X_2$  = Logistics Information System Management

$X_3$  = Customer Relations Management

$X_4$  = Product Packaging

$\varepsilon$  is the error term;

To aid in testing for moderation, model II was used:

$$Y = \alpha + \beta_1X + \beta_2M + \beta_3 (X * M) + \varepsilon \dots\dots\dots ii$$

Where:

X = A computed independent variable from all the four independent variables

M = Moderating Variable (Internal policy framework)

To aid in testing for moderation, the moderating variable was computed by multiplying X by M. A z –score was computed for both X and M to specify the precise location of each value within the distribution by indicating whether the score is above the mean (positive) or below the mean (negative). The numerical value of the z-score specifies the distance from

the mean by counting the number of standard deviations between  $X$  and  $\mu$ . The resultant scores give a distribution that has a mean score of zero and a standard deviation of one.

The  $z$ -score is calculated as:

$$Z = \frac{X - \mu}{\sigma}$$

Where:

$Z$  = the standardized score

$X$  = the  $X$  value

$\mu$  = the mean of the distribution

$\sigma$  = the standard deviation of the distribution.

After the  $z$  score is computed, the following regression model was employed:

There as a significant moderating effect if  $\beta_2 (X * M)$  is statistically significant in the second model.

### **3.10 Operationalization of Study Variables**

The variables in this study were operationalized to enable quantitative measurement. The variables were operationalized in line with the objectives of the study. They have been illustrated in Table 3.3.

**Table 3.3: Operationalization of Study Variables**

Variable	How Variable was Measured	Statistical Model	Main Tools of Analysis
To establish the influence of freight management on performance of food and beverage manufacturing firms in Kenya.	<ul style="list-style-type: none"> <li>Track and Trace</li> <li>Fuel Management</li> <li>Fleet Scheduling and Routing</li> </ul>	$Y = \beta_0 + \beta_1 X_1 + \epsilon$ Where: $Y =$ Firm Performance $\beta_0 =$ Constant $\beta_1 =$ Coefficient of $X_1$ $X_1 =$ Freight Management $\epsilon =$ Error term	Regression and Correlation Analysis; If P value is $\leq 0.05$ research hypothesis is true
To determine the influence of logistics information system management on performance of food and beverage manufacturing firms in Kenya.	<ul style="list-style-type: none"> <li>Database Design and Management</li> <li>Inventory Management</li> <li>Supplier Management</li> </ul>	$Y = \alpha + \beta_2 X_2 + \epsilon$ Where: $Y =$ Firm Performance $\beta_0 =$ constant $\beta_2 =$ Coefficient of $X_2$ $X_2 =$ Logistics Information System Management $\epsilon =$ Error term	Regression and Correlation Analysis; If P value is $\leq 0.05$ research hypothesis is true
To examine the influence of customer relations management on performance of food and beverage manufacturing firms in Kenya.	<ul style="list-style-type: none"> <li>Feedback Channels</li> <li>Customization &amp; Value Addition</li> <li>Product Returns &amp; Recalls</li> </ul>	$Y = \alpha + \beta_3 X_3 + \epsilon$ Where: $Y =$ Performance of Firms $\beta_0 =$ constant $\beta_3 =$ Coefficient of $X_3$ $X_3 =$ CRM $\epsilon =$ Error term	Regression and Correlation Analysis; If P value is $\leq 0.05$ research hypothesis is true

Variable	How Variable was Measured	Statistical Model	Main Tools of Analysis
To assess the influence of product packaging on performance of food and beverage manufacturing firms in Kenya.	<ul style="list-style-type: none"> <li>• Protective and Attractive Pack Design</li> <li>• Illustrative and Descriptive Label</li> <li>• Clear and Consistent Branding</li> </ul>	$Y = \alpha + \beta_4 X_4 + \varepsilon$ <p>Where:  <math>Y =</math> Firm Performance  <math>\beta_0 =</math> constant  <math>\beta_4 =</math> Coefficient of <math>X_4</math>  <math>X_4 =</math> Product Packaging  <math>\varepsilon =</math> Error term</p>	Regression and Correlation Analysis; If P value is $\leq 0.05$ research hypothesis is true
To determine the moderating influence of Internal policy framework on relationship between fourth party logistics service and performance of food and beverage manufacturing firms.	<ul style="list-style-type: none"> <li>• Supply chain policies</li> <li>• Level of Control</li> <li>• Management Policies</li> </ul>	$Y = \alpha + \beta_1 X + \beta_2 (X * M) + \varepsilon$ <p>Where:  <math>Y =</math> Firm Performance  <math>\beta_0 =</math> Constant  <math>\beta =</math> Beta Coefficients of X &amp; M  <math>X =</math> 4PL  <math>M =</math> Policy framework  <math>\varepsilon =</math> Error term</p>	Regression and Correlation Analysis

In each case the joint effect of the independent variables was tested.

## **CHAPTER FOUR**

### **RESEARCH FINDINGS AND DISCUSSIONS**

#### **4.1 Introduction**

This chapter contains research findings and discussions of the study. The section contains the results on demographics characteristics, descriptive results both for secondary and primary data, diagnostic tests and inferential results which include correlation test, univariate and multivariate regression analysis results and moderated multivariate regression analysis results. The chapter further contains the optimal model results and summary of the tested research hypotheses. The presentation of the results was done using charts and tables.

#### **4.2 Response Rate**

The study sampled 132 food and beverage manufacturing firms in Kenya. One hundred and thirty-two (132) questionnaires were dropped in all the sampled food and beverage manufacturing firms and picked after a period of between two and five days depending on the responses. The questionnaires were filled by the supply chain managers in charge of procurement departments in the sampled firms. A response rate of 89% was obtained where 117 questionnaires were collected back for analysis. This was considered an adequate representation of the sample size as backed by Kothari (2014) and Saunders (2019) who allude that a response rate of 60% and above is a good representation of the sample size in a social science study. Table 4.1 presents the results for response rate obtained.

**Table 4.1: Response Rate**

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
Successful	117	89%
Unsuccessful	15	11%
<b>Total</b>	<b>132</b>	<b>100%</b>

### **4.3 Results of the Pilot Study**

Pilot test of the study was carried out prior to implementation of the study to ensure that the questionnaires measured what was intended (Cooper & Schindler, 2010). According to Kothari (2014), 10% of study population is appropriate for pilot test. The study used 10% of the targeted population to carry out pilot test. This helped identify any ambiguous and unclear questions. Feedback received was used to fine tune the questionnaire before embarking on the actual data collection. Research experts were also consulted to review the instrument to ascertain face validity.

#### **4.3.1 Reliability Test Results**

Reliability is an indication of the stability and consistency with which the instrument measures a concept and helps to assess the goodness of a measure (Cooper & Schindler, 2011). According to Bell, Bryman, and Harley (2018), Cronbach's Alpha of 0.70 or higher indicated that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population (Bell, et al., 2018). Xian and Meng-Lewis (2018) points out that a value of 0.70 is the minimum acceptable value for Cronbach's Alpha reliability.

The Cronbach's alpha was used in this study to measure the internal consistency of the variables. Reliability test was done where Cronbach's Coefficient Alpha was used. According to Kline (2014) a value of 0.8 is generally acceptable for cognitive test as an indicator of reliability. For social-science constructs values below 0.7 can be expected

because of the diversity of the construct being measured. The items on each of the variables in the questionnaire were subjected to Cronbach’s Coefficient Alpha test of all the items were found to be reliable for measurement because the reliability coefficient was found to be above the recommended threshold of 0.7 (Kline, 2014) as indicated in Table 4.2.

**Table 4.2: Reliability Test Results**

<b>Variable</b>	<b>No of Items</b>	<b>Respondents</b>	<b><math>\alpha</math>=Alpha</b>	<b>Comment</b>
Freight Management	13	11	0.893	Reliable
Logistics Information System Management	13	11	0.987	Reliable
Customer Relations Management	13	11	0.974	Reliable
Product Packaging	13	11	0.987	Reliable
Performance of Food and Beverage Processing Firms	8	11	0.815	Reliable
Internal Policy Framework	10	11	0.793	Reliable
Overall Reliability	70	11	0.908	Reliable

#### **4.3.2 Validity of the Research Instruments**

Validity is the ability of the research instrument to measure what it is supposed to measure (Berényi & Deutsch, 2018). There are several types of validity tests that can be conducted on an instrument namely construct, content, face and criterion related validity (Trochim, Donnelly & Arora, 2016). Content validity can be determined by pre-testing the questionnaire. Face validity was tested using expert’s opinion. Two experts in the field of logistics and supply chain were given the questionnaire to review and give their opinions



regarding its ability to obtain the intended data. They agreed that the questionnaire met the threshold to answer to the research questions.

Content validity was assessed through review and verification of the extant literature for the items contained in the questionnaire. Construct validity was assessed from the correlations of items. Positive and significant correlations are expected for convergent validity while for divergent validity, items are expected to positively and significantly correlate with one another, but not with items from other dimensions (Daniel, 2012).

The questionnaire was pilot tested in selected respondents to establish if the respondents can answer the questions without difficulty. The feedback received has been used to fine tune the questionnaire before embarking on the actual data collection.

Construct validity was further tested by use of factor analysis using Principal Component Analysis (PCA). The items were run into the SPSS to come up with the extractions and the findings are as herein shown. The first variable, freight management had a PCA coefficient of 0.881 while the logistics management information systems had a factor loading of 0.770, customer relations management had 0.895 and product packaging and labelling had a factor loading coefficient of 0.921. The moderating variable; Internal policy framework had a factor loading coefficient of 0.842 while the dependent variable; performance of food and beverage manufacturing companies had a factor loading coefficient of 0.702. The results imply that the items under study variables had factor loadings above 0.30 with the overall factor loadings being above 0.70 hence they were deemed valid. According to Merlirt (2014), extractions of more than 0.30 are considered valid for the data collection provided the overall factor loading for the items is 0.70 and above.

**Table 4.3: Principle Component Analysis**

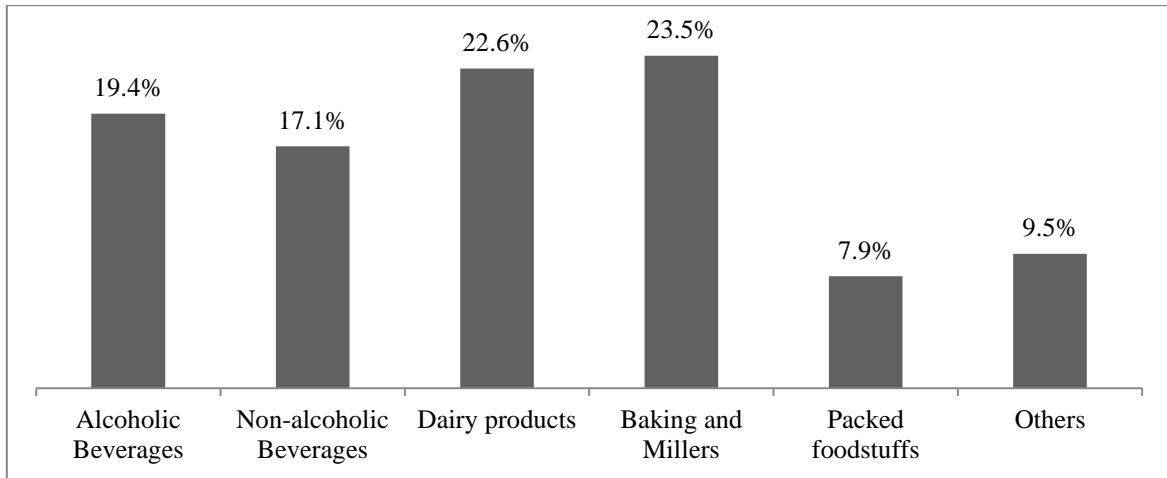
<b>Variable</b>	<b>PCA Coefficient</b>
Freight Management	0.881
Logistics Information System Management	0.770
Customer Relations Management	0.895
Product Packaging	0.921
Internal policy framework	0.842
Firm Performance	0.702

#### **4.4 Demographic Information of the Respondents**

Demographic information is important as indicated by David (2014) is crucial in a study in that it enhances the ability by the respondents to establish the underlying issues that could shape the trend of the responses in a study. Through demographic analysis, the researcher is able to identify the background focus of the organization as well as form a basis of introduction of the respondent to the main questions of the study. The study sought to find the demographic characteristics of the respondents. These included the number of products the companies deal with, the category of the firm's main products, and the organization's period of service in the Kenyan Market. The results were presented in tables.

##### **4.4.1 Category of the Firm**

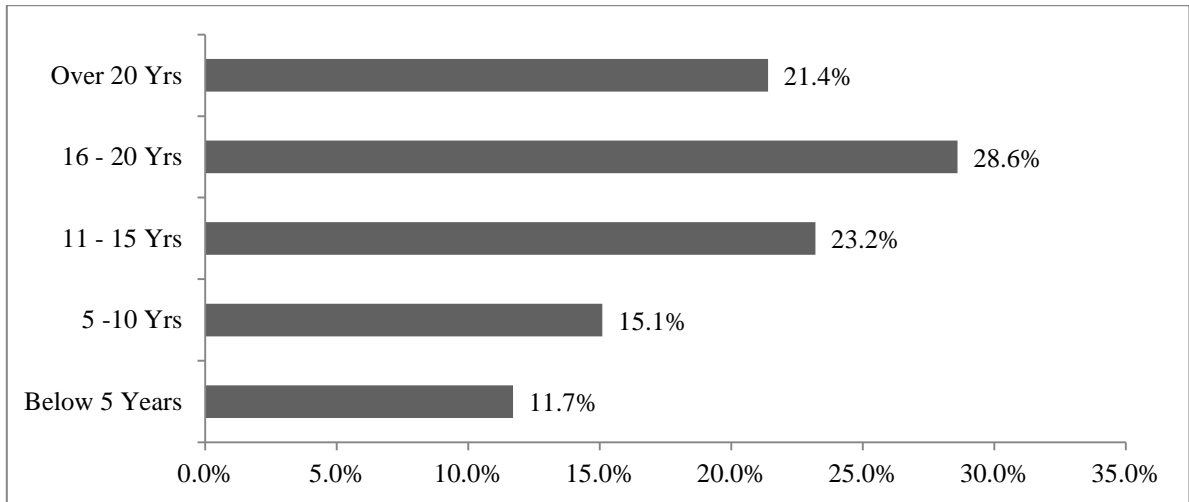
The respondents were asked to indicate the category of their respective food and beverage processing firms. According to KAM (2017), the food and beverage processing firms are further categorized into five specific categories based on their specialization. These categories include: dairy products, non-alcoholic beverages, alcoholic beverages, bakers and millers, packed foodstuffs, and others category which has all other small-scale food products. The findings as shown in Figure 4.1 revealed that 23.5% of the companies were under bakers and millers, 22.6% were dairy products dealing companies, 19.4% belonged to the category of alcoholic beverages and 17.1% belonged to the category of non-alcoholic beverages. The distribution shows that the study cut across the entire sector of the food and beverage processing firms hence their views would be captured during the main study.



**Figure 4.1: Category of the Firms**

#### **4.4.2 Firms' Period of Operation**

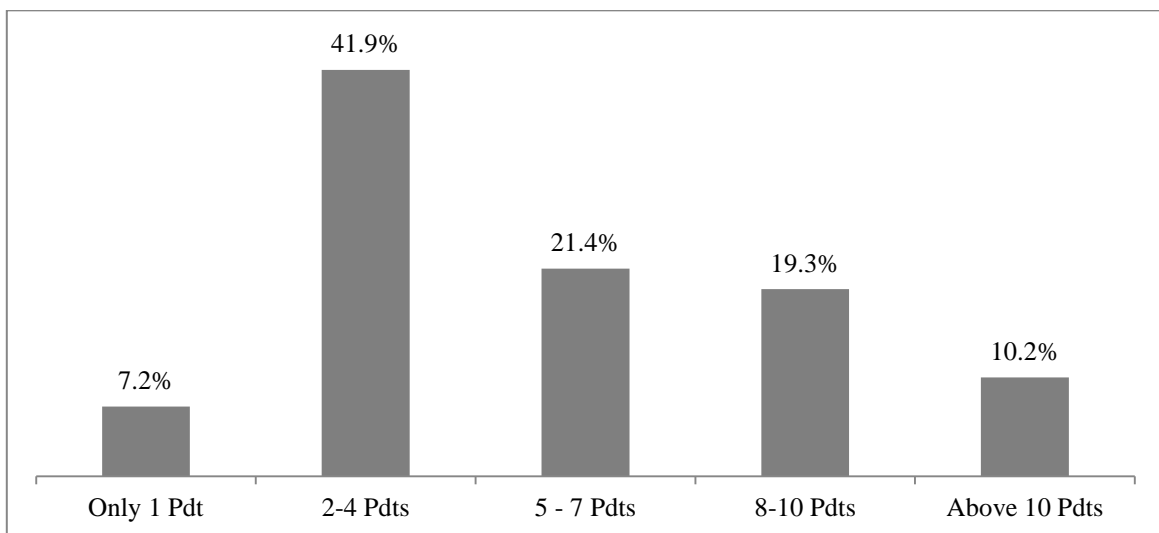
The respondents were asked to indicate the period of operation for their respective firms in years. The findings as shown in Figure 4.2 revealed that 28.6% of the firms had been in operation for a period of between 16 and 20 years, 21.4% had operated for over 20 years while 23.2% had been in operation for a period of between 11 and 15 years. On the other hand, 15.1% of the respondents indicated that their respective food and beverage processing firms had been in operation of a period between 5 and 10 years while 11.7% indicated that their firms had been in operation for less than 5 years. The findings implied that most of the surveyed food and beverage processing firms in Kenya had been in operation for a reasonable number of years hence they were likely to be facing the supply chain concerns and understood how to turn around and enhance performance.



**Figure 4.2: Firms’ period of Operation**

#### 4.4.3 Firms’ Number of Products

The respondents were asked to indicate the number of products that their respective food and beverage processing firms deal in. The findings revealed that most of the companies were dealing in between 2 and 4 products, 21.4% dealt in between 5 and 7 products, 19.3% were producing over 10 products. Only 7.2% of the companies were dealing with one product. The findings imply that the food and beverage processing firms were extensively diversifying in the food and beverage products hence their logistics ought to be appropriately streamlined to enhance performance.



**Figure 4.3: Firms’ Number of Products**

## **4.5 Descriptive Analysis of the Findings**

Descriptive statistics according to Kaur, PStoltzfus, and Yellapu (2018), covers the description of the study findings as observed. They describe what was observed and give the researcher the direction to give inferences and implication of the study findings. Through descriptive statistics the researcher is able to show the extent to which the research findings have answered the research questions (Mishra, Pandey, Singh, Gupta, Sahu, & Keshri, 2019). This sub-section captures the descriptive analysis of the study variables. Descriptive analysis was carried out where the respondents' views of the research questions were reported as they were. The main statistics included in the standard deviation, means and percentages. The analysis is done systematically based on the research objectives of the study.

### **4.5.1 Freight Management**

The first objective of the study was to assess the influence of freight management on performance of food and beverage manufacturing firms in Kenya. The study sought to assess the respondents' views on the freight management as it has been applied in their respective organizations and how it contributed to performance of their respective firms. The respondents were asked to indicate their level of agreement or disagreement with key statements drawn from the sub-constructs of freight management which were: track and trace systems, fuel management systems, and fleet scheduling and routing. A 5-points Likert's scale was used where 1 was strongly disagree, 2 = disagree, 3- neutral, 4= agree and 5= strongly agree. The scores of 'strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'neutral' has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5. The findings are as shown in Table 4.4.

As the findings portray, majority of the respondents agreed that their respective companies had embraced a tracking system for their trucks and other mobile equipment (Strongly Agree = 56%; Agree = 29.1%, Mean = 4.48, standard deviation = 0.65). The measure of dispersion around the mean of the statements was 0.65 indicating the responses were varied. The

findings revealed that majority of the respondent as indicated by a mean of 4.02 agreed with the statement that the trace systems were monitored to ensure they were effective and up-to-date. The findings compare with those by Gruchmann et al. (2020) who established that the tracking systems continue to be embraced in manufacturing sector owing to their ability to strengthen the effectiveness in freight management and steering effectiveness and efficiency.

The result revealed that majority of the respondent (4.63) agreed with the statement there have been minimal cases of freight loss after the track systems are put in place. The results were varied as shown by a Standard Deviation of 0.56. Findings also showed that majority of the respondent (4.06) agreed with the statement Installing track and trace systems significantly influences cost reduction. The results were varied as shown by a Standard Deviation of 0.56. Further results indicated there were proper mechanisms of ensuring the fuel management system is effectively utilized. The mean for this comment was 3.61 accompanied by a varied response of 0.75. The findings are in line with the findings of Aziz et al. (2020) that revealed the essence of trace and track systems in reducing the loss of freight as well as building confidence among the customers for enhanced security of their freight.

Results indicated that embracing systems for managing fuel had enabled the company to save on fuel wastage. The mean for this comment was 3.59 accompanied by a varied response of 0.73 results indicated that organization upheld effective scheduling of delivery routes as shown by a mean of 4.48. Results indicated that fleet in their respective companies were scheduled in a manner that saved on time and cost. The mean for this comment was 3.39 accompanied by a varied response of 0.55. The respondents further indicated that framework of scheduling fleet and routes had enabled their respective firms to enhance effectiveness as evidenced by a mean of 3.96 and a standard deviation of 0.16.

The findings imply that freight management is a key aspect of fourth party logistics that has been essential in enhancing the effectiveness of logistics management thus leading to enhanced firm performance among the food and beverage manufacturing companies in Kenya. The findings that freight management has been instrumental in the food and beverage manufacturing firms concur with those by Saliba (2013) who found out that embracing the

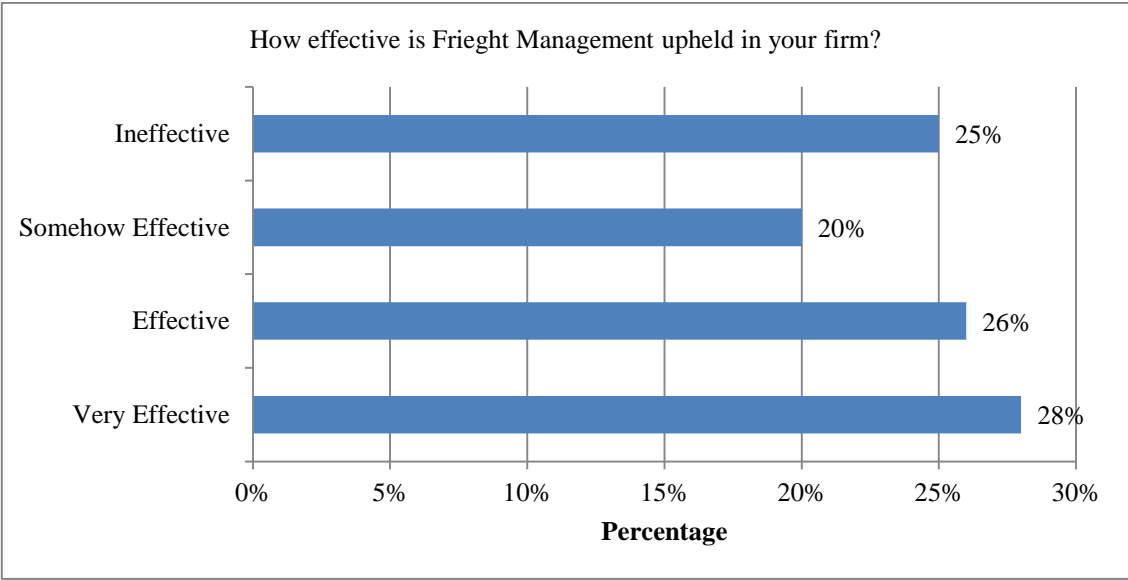
appropriate systems such as fuel management and tracking systems enhances the management of the freight which is important in ensuring effective transportation and delivery of freight as designated thus saving costs and promoting efficiency and performance.

**Table 4.4: Descriptive Analysis for Freight Management**

<b>Statements</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
The company has embraced a tracking system for its trucks and other mobile equipment	4.3%	4.3%	6.4%	29.1%	56.0%	4.48	0.65
The trace systems are monitored to ensure they are effective and up-to-date	3.4%	7.7%	7.7%	29.1%	52.1%	4.02	0.49
There have been minimal cases of freight loss after the track systems are put in place	7.7%	9.4%	9.4%	61.5%	12.0%	4.63	0.56
The company has embraced systems for managing fuel in all its vehicles	6.0%	8.5%	4.3%	23.9%	57.3%	4.06	0.56
There are proper mechanisms of ensuring the fuel management systems is effectively utilized	11.1%	11.1%	8.5%	53.0%	16.2%	3.61	0.75
Embracing systems for managing fuel has enabled the company to save on fuel wastage	9.4%	5.1%	48.7%	22.2%	14.5%	3.59	0.73
The organization upholds effective scheduling of delivery routes	5.1%	7.7%	44.4%	28.2%	14.5%	4.48	0.67
The fleet in our company are scheduled in a manner that saves on time and cost	3.4%	3.4%	10.3%	27.4%	55.6%	3.39	0.55
The framework of scheduling fleet and routes has enabled our firm to enhance effectiveness	10.9%	5.9%	56.3%	24.4%	2.5%	3.96	0.16

**Key:** SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree

The respondents were further asked to indicate how effective freight management was upheld in their respective organizations. As the findings in Figure 4.4 reveal, 28% of the respondents indicated that freight management system was very effective in their respective companies, 26% indicated that it was effective, 20% considered freight management to be neutral while 25% of the respondents considered freight management to be ineffective in their respective firms. This is an indication that there are a significant number of food and beverage processing firms that are yet to uphold freight management systems in their logistics. The findings are in line with those by Ketokivi, and Schroeder (2014) who established that freight management in the manufacturing sector was an essential supply chain driver that streamlined and enhanced the management of the logistics thus enhancing firm performance.



**Figure 4.4: Adoption of Freight Management**



#### **4.5.2 Logistics Information System Management**

The second objective of the study was to establish the influence of logistics information system management on performance of manufacturing firms in Kenya. The key measures of logistics information system management used were: database design and management, inventory management systems, and supply and production management systems. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these sub-constructs. A five-points Likert's scale was used where 1 was strongly disagree, 2 = disagree, 3- neutral, 4= agree and 5= strongly agree. Table 4.5 shows the descriptive findings. The scores of 'strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'neutral' has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5. Table 4.5 shows the findings.

As the findings portray, majority of the respondents agreed that their respective companies had an active database for keeping all logistics information as evidenced by a mean of 3.29 and a standard deviation of 1.00. The respondents further stated that available database was designed in a secure and easily accessible manner (Strongly agree = 36.8%; Agree = 6.8%). The study further revealed that majority of the respondents were of the opinion that through a well-managed and designed database we are able to monitor the logistics of the company as evidenced by a mean of 4.00 and a standard deviation of 1.20. The findings are in line with those by Atos (2019) who established that logistics information systems through a well-designed database enhances the prospects of ensuring that the information and other materials regarding database management are appropriately managed for better performance.

The findings further revealed that majority of the respondents were of the opinion that through effective system for monitoring the inventory management systems had a significant impact on reducing the operational costs and costs of handling inventory (Agree = 12.0%; strongly agree = 67.5%; mean= 3.4.28; standard deviation = 1.22 It was further

established that inventory levels and flow were appropriately controlled using the adopted system as shown by a mean of 3.82 and a standard deviation of 0.88. The respondents further agreed that their respective companies through the management was committed towards embracing the best systems of managing inventory (mean= 3.56; standard deviation = 1.16). Most of the companies had company had an active system for engaging and sharing information with suppliers (Mean = 3.49; standard deviation = 0.92) and that product process in their companies was monitored by effective systems (mean = 4.02; standard deviation = 1.25) and the management of the organizations had been committed on embracing information technology in key supplier chain frameworks (Mean = 3.59; standard deviation = 1.01). Rao and Young (2015) intimate that fourth party logistics are based on the development of fourth party logistics and it is an extension of fourth party logistics, it provides value added service such as planning, information technology integration, transport planning, order tracking and tracing, logistics consulting, application solution, and financial services. From the logistic company to its consigners, as a logistics company its task is to transport the goods from consigner to consignee, and to be a fourth party logistics provider, logistics need to find ways to build strong relations between themselves and their customers, with the above-mentioned supporting function to reach the highest level of service efficiency that is fourth party logistics are integrated logistics management (Wang, Huang, Ip & Wang, 2021).

Database design and management and inventory management systems were also found to contribute to the reduction of turnaround time which is essential in enhancing organizational performance. The findings imply that logistics information systems management is an essential driver to the effectiveness of supply chain in the food and beverage processing firms in Kenya. The findings compare with those by Tilokavichai, and Sophatsathit (2011) who found out that through extensive management of the logistics information systems and integration of the appropriate technology in the supply chain process, modern organizations are more likely to meet the customer needs and enhance efficiency thus gaining more performance and competitiveness.

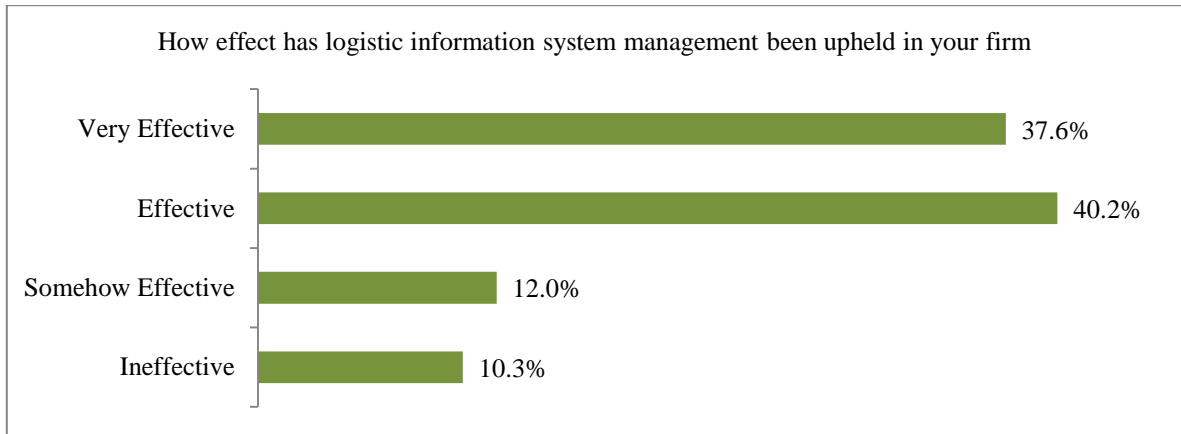
**Table 4.5: Descriptive Analysis for Logistics Information System Management**

<b>Statements</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
Our company has an active database for keeping all logistics information	7.7%	4.3%	20.4%	55.6%	12.0%	3.29	1.00
The available database is designed in a secure and easily accessible manner	3.4%	5.1%	47.9%	36.8%	6.8%	3.38	.82
Through a well-managed and designed database, we are able to monitor the logistics of the company	2.6%	16.2%	7.7%	24.8%	48.7%	4.00	1.20
Our company has an effective system for monitoring the inventory	7.7%	3.4%	9.4%	12.0%	67.5%	4.28	1.23
The inventory levels and flow are appropriately controlled using the adopted system	5.1%	4.3%	6.0%	72.6%	12.0%	3.82	.88
The company through the management is committed towards embracing the best systems of managing inventory	13.7%	3.4%	6.8%	65.0%	11.1%	3.56	1.16
The company has an active system for engaged and sharing information with suppliers	2.6%	4.3%	52.1%	23.1%	17.9%	3.49	.92
The product process in our company is monitored by effective systems	7.7%	5.1%	15.4%	20.5%	51.3%	4.02	1.25

<b>Statements</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
The management of the organization has been committed on embracing information technology in key supplier chain frameworks	6.0%	11.1%	10.3%	62.4%	10.3%	3.59	1.01

**Key:** SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree

The study further sought to establish the extent to which the surveyed firms had upheld logistics information system management. The respondents were asked to indicate how effective the logistic information system management was in use in their respective firms. The findings as shown in Figure 4.5 revealed that 37.6% of the respondents believed that their respective firms were very effective in logistics information system management, 40.2% of the respondents believed that they were effective in logistics information system management, 12% indicated somehow effective in logistics information system management, while 10.3% indicated logistics information system management was ineffective in their respective firms. The findings imply that still a significant number of the food and beverage firms surveyed had not effectively upheld logistics information system management which could mean poor management of their fourth party logistics thus affecting their performance. This also compares with what has been indicated Fabbe-Costes, Jahre, and Roussat (2014) that integrating logistics information systems management is a core function in fourth party logistics that steers the flow of information and how logistics are effectively delivered for continued customer satisfaction and organizational performance.



**Figure 4.5: Upholding Logistics Information System Management**

### 4.5.3 Customer Relations Management

The third objective of the study was to establish the influence of customer relations management on the performance of food and beverage processing firms in Kenya. The key sub-constructs used in the study to assess customer relations management were: customer feedback channels, customization and value addition of products, product returns and recalls management. The respondents were asked to indicate their level of agreement or disagreement with specific statements on customer relations management drawn from these sub-constructs. The scores of ‘strongly disagree’ and ‘disagree’ have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of ‘neutral’ has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4. The score of ‘agree’ and ‘strongly agree’ have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5. The findings are as shown in Table 4.6.

The findings revealed that majority of the respondents (strongly agree = 53%; agree = 23.1%; mean = 4.10) agreed that their respective companies had active platforms for sharing information with the customers. They further agreed that customers were given feedback to their queries timely (84.6%; Mean = 4.26). The respondents further agreed that there were approaches where employees could share their views to any individual within the company as shown by a mean of 3.73 and a standard deviation of 1.06. The findings compare with those by Johannessen (2020) who established that through customer

relations management and giving the right attention to the customer, the logistics management becomes easier and to the standards expected by the customers thus enhancing organizational performance.

The findings further revealed that the products were designed and produced as per the customer specifications (Mean =3.17; standard deviation = 1.16); and that the companies upheld value adding the products and services to exceed the customer expectations (Mean = 3.79; standard deviation = 0.967). The respondents further agreed that customers were involved in every stage of delivering their orders (Agree = 59.8%; strongly agree = 16.2%; mean = 3.70; standard deviation= 1.05). The respondents agreed that customers were always free to return any products that do not meet their specifications as shown by a mean of 3.76 and a standard deviation of 1.42. The respondents indicated that customers were always free to return any products that do not meet their specifications and that their respective companies had a policy for recalling any products that were delivered to the customers without meeting the expectations (mean = 3.23; standard deviation = 1.00) and management of their companies had been committed towards enhancing the relations of the customers and quality services/products as shown by a mean of 4.19 and a standard deviation of 1.21.

The findings imply that most of food and beverage processing firms are committed towards ensuring customer relationship management is enhanced through addressing key concerns that dissatisfy customers and embracing the customer service strategies. The findings compare with those by Paul, Knemeyer, and Thomas (2013) who established that logistics outsourcing is done with the main aim of enhancing the satisfaction of customers and ensuring that the customers are able to access the required products and services more effectively. Gencer (2019) also felt that focusing on customers ought to be the main agenda upheld by modern businesses especially in supply chain and logistics as a way of enhancing customer satisfaction and firm performance.

**Table 4.6: Descriptive Results on Customer Relations Management**

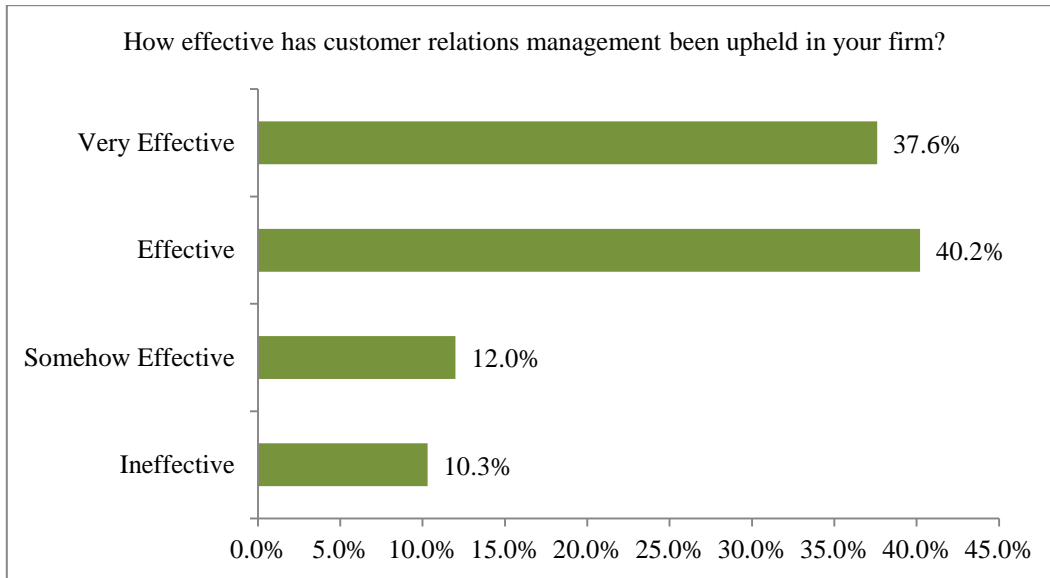
<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mea n</b>	<b>Std. Dev.</b>
The company has an active platform for sharing information with the customers	6.0%	6.8%	11.1%	23.1%	53.0%	4.10	1.20
The customers are given feedback to their queries timely	5.1%	2.6%	7.7%	29.9%	54.7%	4.26	1.06
There are approaches where employees can share their views to any individual within the company	5.1%	12.0%	6.8%	56.4%	19.7%	3.73	1.06
The products are designed and produced as per the customer specifications	14.4%	4.2%	48.3%	17.8%	15.3%	3.17	1.16
The company upholds value adding the products and services to exceed the customer expectations	6.0%	5.1%	7.7%	65.8%	15.4%	3.79	.967
The customers are involved in every stage of delivering their orders	6.8%	7.7%	9.4%	59.8%	16.2%	3.70	1.05
The customers are always free to return any products that do not meet their specifications	10.3%	15.4%	6.8%	22.2%	45.3%	3.76	1.42

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mea n</b>	<b>Std. Dev.</b>
The company has a policy for recalling any products that are delivered to the customers without meeting the expectations	6.8%	7.7%	53.8%	18.8%	12.8%	3.23	1.00
The management of our company has been committed towards enhancing the relations of the customers and quality services/products	8.5%	1.7%	9.4%	22.2%	58.1%	4.19	1.21

**Key:** *SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree*

The study further sought to establish the extent to which customer relations management was upheld in the surveyed food and beverage manufacturing firms. The respondents were asked to indicate how effective their respective organizations utilized and adopted customer relations management. As the findings on Figure 4.6 reveal, 37.6% of the respondents indicated that their respective firms had upheld customer relations management to a very effective score, 40.2% of the respondents believed that they were effective in adopting customer relations management, 12% of the respondents believed that they were somehow effective in embracing customer relations management while 10.3% were of the opinion that customer relations management was not effectively upheld in their respective firms. According to Buyukozkan et al. (2015), upholding customer relations in a fourth part logistics is essential in promoting the performance of the supply chain and enhancing the competitiveness of modern organizations.





**Figure 4.6: Upholding Customer Relations Management**

#### 4.5.4 Product Packaging

The fourth objective of the study was to establish the influence of product Packaging on performance of food and beverage manufacturing firms in Kenya. The responses were rated on a Likert's scale and the results presented in Table 4.7 below. It was rated on a 5-point Likert scale ranging from; 1 = strongly disagree to 5 = strongly agree. The scores of 'strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'neutral' has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.

The results revealed that majority of the respondents agreed that packaging materials used in their respective companies' products were not harmful to individuals or environment as shown by a mean of 3.94 and a standard deviation of 1.05. Further majority of the respondents (78.7%) agreed that their companies adopted product designs that ensured the products were protected from any external damage (mean = 4.06; standard deviation = 0.98). The respondents indicated that the designs used in packaging enhanced in order to be appealing to the customers (agree= 59%; strongly agree = 23.1%; mean = 3.84). The

findings concur with the argument by Joiner (2012) who established that product design through appropriate branding and adopting attractive products designs, more customers are attracted and this enhances organizational performance and competitiveness.

The findings further revealed that the companies' products were labelled appropriately to capture all the required information and that the information given when describing the products was truthful and adequate. This is shown by mean of 3.59 and 3.85 respectively. The respondents agreed that their respective organizations the labels used were coherent with their customers language and level of understanding (strongly agree = 57.3%; agree= 19.7%; mean = 4.06). The findings further revealed that most of the respondents were of the opinion that the products were branded in clear design that customers were able to distinguish (Mean = 3.90; standard deviation = 0.88) and that the branding of their companies' products were consistent across all the categories of the products (Mean = 4.08; standard deviation = 1.31). The respondents further agreed that most of the customers were familiar with their products' brand as shown by a mean of 3.95 and a standard deviation of 0.85). The findings imply that through appropriate focus on products and designing them in a more attractive way, the organization gains more competitiveness and performance is enhanced. According to Ketokivi, and Schroeder (2014), companies in dynamic industries such as the manufacturing industry ought to be focused in designing products that are well advanced as per the advancing technology as a way of meeting customer preference and ensuring continued improvement.

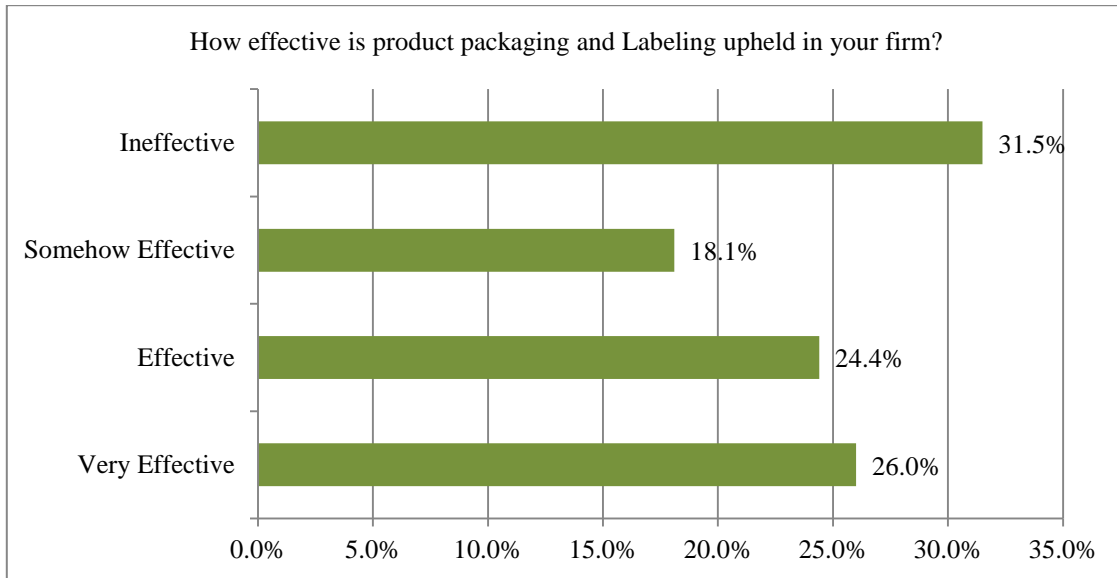
**Table 4.7: Descriptive Analysis for Product Packaging**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
The packaging materials used in our products are not harmful to individuals or environment	16.2%	19.4%	9.6%	13.7%	41.1%	3.94	1.05
The company adopts product designs that ensure the product is protected from any external damage	9.4%	5.1%	6.8%	27.4%	51.3%	4.06	0.98
The designs used in packaging enhance in order to be appealing to the customers	6.8%	6.8%	4.3%	59.0%	23.1%	3.84	1.07
Our company's products are labeled appropriately to capture all the required information	11.1%	8.5%	7.7%	54.7%	17.9%	3.59	1.20
The information given when describing our products is truthful and adequate	5.1%	3.4%	8.5%	66.7%	16.2%	3.85	0.91
The labels used are coherent with our customers language and level of understanding	12.0%	4.3%	6.8%	19.7%	57.3%	4.06	1.37

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
Our products are branded in clear design that customers are able to distinguish	4.3%	5.1%	56.4%	23.9%	10.3%	3.90	0.88
The branding of the company's products is consistent across all the categories of the products	10.3%	2.6%	12.0%	18.8%	56.4%	4.08	1.31
Most of the customers in our company are familiar with our products' brand	2.6%	6.8%	13.0%	27.4%	50.3%	3.95	0.85

**Key:** *SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree*

The respondents were further asked to rate the extent to which product packaging was effectively embraced in their respective organizations. As the findings in Figure 4.7 portray, 31.5% of the respondents indicated that the product Packaging was ineffectively upheld in their respective firms, 18.1% indicated somehow effective, 24.4% said that the aspects was effectively upheld while 26% indicated that product labelling and packaging was very effectively upheld in their respective organizations. The findings imply that while a good number of the food and beverage processing firms upheld product Packaging, there was a significant number of firms that did not uphold the aspect which could affect their performance. This compares with the argument by Lieb and Butner (2013) who established that logistics management is about ensuring that the right products get to the customers and this can be obtained through continued improvements in product designing and labelling.



**Figure 4.7: Effectiveness of Product Packaging**

#### **4.5.5 Descriptive Analysis for Internal Policy Framework**

The fifth objective of the study was to assess the moderating effect of internal policy framework on the relationship between fourth party logistics services and the performance of food and beverage manufacturing firms in Kenya. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these sub-constructs. A five-points Likert's scale was used where 1 was strongly disagree, 2 = disagree, 3- neutral, 4= agree and 5= strongly agree. The scores of 'strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'neutral' has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5. The findings are as shown in Table 4.8.

The findings revealed that most of the respondents disagreed that their companies were always alert on changes in policies and regulations (Mean = 2.99; standard deviation = 0.97). The respondents indicated that the companies through the management always ensures that it has well-set policies on supply chain processes as evidenced by a mean of 3.98 and a standard deviation of 1.33. The findings further had it that the companies

emphasized on carrying out logistics with partners who have adhered to the existing policies (Agree = 17.9%; strongly agree = 50.4%; mean = 3.76). The findings imply that some aspects of internal policy framework have a hand in reducing lead time than others. This shows the need for companies to keenly analyse on how to integrate the policies in their logistics planning for effectiveness and efficiency (Mathenge & Dihel, 2011).

The findings further revealed that majority of the respondents agreed that their respective firms always ensured that there was a control framework for the logistics operations (Agree = 57.3%; strongly agree = 16.2%; Mean = 3.67). It was also established that level of the company's control in fourth party logistics has been high (Mean= 3.82; standard deviation = 1.01); the management of the companies had set out a standard for adhering to the existing logistics policies (Mean = 3.49; standard deviation = 1.25) and that there was a significant level of transparency between our company and its logistics partners (mean = 3.76; standard deviation = 1.48). The respondents further indicated that their respective companies frequently carried out assessed the situation when formulating internal policies on the fourth party logistics partners as shown by a mean of 3.15 and a standard deviation of 0.97 and that through adherence to the existing policies, the companies enhanced their effectiveness as evidenced by a mean of 4.01 and a standard deviation of 1.18. Generally, the findings imply that internal policy framework had a moderate extent of influencing the role of fourth party logistics on the performance of food and beverage processing firms in Kenya. In a study on the effect of partner collaboration in logistics, McNichols, and Brennan (2016) established that the policies set to govern the way logistics operations are carried out in organizations define how effective the logistics framework adopted can become hence the need for continued focus on policies before having given logistic frameworks put in place.

**Table 4.8: Descriptive Analysis for Internal Policy Framework**

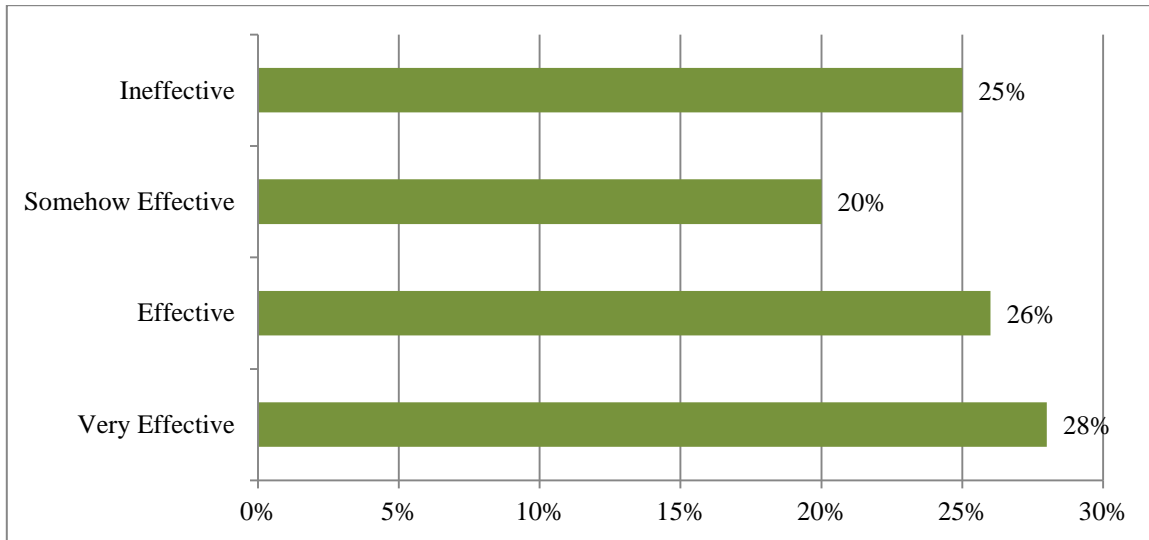
<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
Our company is always alert on changes in policies and regulations	9.4%	13.7%	51.3%	19.7%	6.0%	2.99	0.97
The company through the management always ensures that there are policies on supply chain processes	7.7%	12.8%	4.3%	23.9%	51.3%	3.98	1.33
The company has emphasized on carrying out logistics with partners who have adhered to the existing policies	17.9%	6.8%	6.8%	17.9%	50.4%	3.76	1.55
The company always ensures that there is a control framework for the logistics operations	3.4%	15.4%	7.7%	57.3%	16.2%	3.67	1.03
The level of our company's control in fourth party logistics has been high	41.4%	3.0%	4.0%	5.6%	33.3%	3.82	1.01
The management has set out a standard for adhering to the existing logistics policies	15.4%	6.0%	5.1%	60.7%	12.8%	3.49	1.25
There is a significant level of transparency between our company and its logistics partners	12.8%	12.8%	7.7%	17.9%	48.7%	3.76	1.48

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
The company frequently carries out assessments to ensure internal policies align with fourth party logistics partners	8.5%	6.8%	53.8%	22.2%	8.5%	3.15	0.97
Through adherence to the existing policies in logistics, the company has enhanced its effectiveness	6.0%	4.3%	19.7%	22.2%	47.9%	4.01	1.18

**Key:** *SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree*

The respondents were further asked to indicate the effectiveness in which they upheld the aspect of logistic management policy in their respective organizations. The findings as shown in Figure 4.8 revealed that policy governance framework was ineffective in 25% of the surveyed firms, 20% somehow effectively upheld it while 54% effectively upheld the internal policy framework as a key driver to their organizational performance. According to Wardaya, Hadiwidjoyo, and Surachman (2013), logistics policies are essential in defining the flow of the logistics in modern firms hence the need for continued focus on policies set on logistics.





**Figure 4.8: Effectiveness of Internal Policy Framework**

#### **4.5.6 Performance of Food and Beverage Manufacturing Firms**

The study sought to find out the performance of the food and beverage manufacturing firms in Kenya. The respondents were asked to indicate their level of agreement on specific statements drawn from the key measures of performance used in the study. The scores of ‘strongly disagree’ and ‘disagree’ have been taken to represent a statement not agreed upon, equivalent to a mean score of 0 to 2.5. The score of ‘neutral’ has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4. The score of ‘agree’ and ‘strongly agree’ have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5. The findings are as shown in Table 4.9.

The results revealed that majority of the respondents were of the opinion that their respective companies had not seen an increase in the customer satisfaction index over the past five years (Strongly agree = 5.1%, agree = 66.7%, mean = 3.51 and standard deviation = 1.01). The findings further revealed that most of the food and beverage manufacturing firms had not ensured that the customers’ waiting time is reduced over the time as shown by a mean of 2.77 and a standard deviation of 0.76. The findings further revealed that most of the respondents disagreed that the sales volumes in their respective companies had increased for the past five years as shown by a mean of 2.81 and a standard deviation of 1.09.

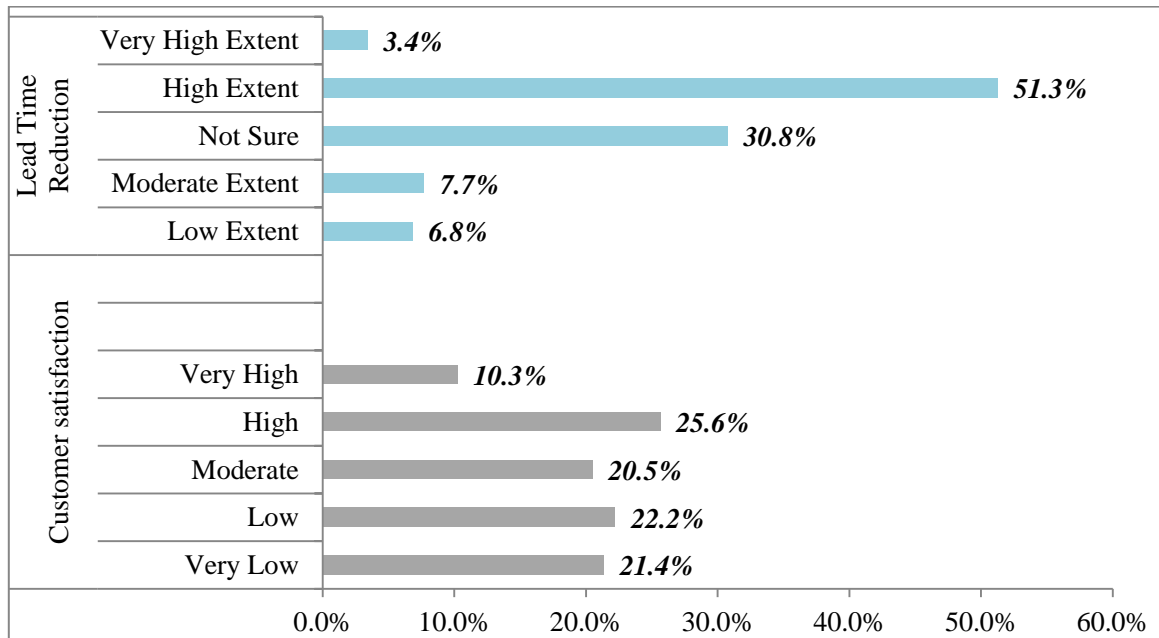
The respondents disagreed that their respective companies' level of production had been optimized to meet market demand for the past five years as shown by a mean of 2.51 and a standard deviation of 0.98 and that the distribution of the products was effectively done to minimize on poor quality on transit (mean = 2.61; standard deviation = 1.16). The respondents further disagreed that the costs of managing inventories have reduced in our company due to focus on lead time management as shown by a mean of 2.64 and a standard deviation of 1.48. The findings imply that as per the opinions of the respondents, the food and beverage manufacturing firms are fairly and unstably performing thus calling for a high need for improvement and continued focus on key logistics management frameworks that could enhance their performance. The findings imply that the performance of the food and beverage manufacturing firms has not been effective as far as their productivity, profit margins and sales revenue are concerned. Firm level performance indicates the firm's ability to design, produce and market products superior to those offered by competitors, where superiority can be evaluated from several factors, like price, quality, technological advancement, etc (Viviers *et al.*, 2018).

**Table 4.9: Descriptive Results on Firm Performance**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
The customer satisfaction index in our company has continually increased over the past five years	6.8%	12.0%	9.4%	66.7%	5.1%	3.51	1.01
The company has ensured that the customers' waiting time is reduced over the time	10.3%	72.3%	10.6%	5.1%	1.7%	2.77	0.76
Sales volumes in our company have increased for the past five years	63.8%	15.0%	6.4%	6.7%	8.1%	2.81	1.09

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std. Dev.</b>
Our company's level of production has been optimized to meet market demand for the past five years	9.4%	50.4%	25.6%	8.5%	6.0%	2.51	0.98
The company has significantly reduced its production costs for the past five years	23.9%	21.4%	24.8%	29.1%	0.9%	2.61	1.16
The lead time in our company has been significantly reduced for the past five years	37.6%	10.3%	12.8%	29.1%	10.3%	2.64	1.48
<b>Measurement Aspects</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	
Customer Satisfaction Index (%)	16.4%	21.7%	23.5%	19.5%	20.3%	19.2%	
Sales Volume in Kshs '000'	356M	319M	356M	209M	259M	258M	
Average Lead time in weeks	28	22	19	31	34	32	
Cost of Production materials in Kshs. '000'	481M	409M	519M	467M	511M	603M	
Value of produced goods in Kshs. '000'	756M	623M	677M	712M	723M	744M	
Operational costs in Kshs. '000'	122M	109M	178M	162M	119M	189M	
Average waiting time in weeks	34	37	41	49	43	39	

The respondents were further asked to rate customer satisfaction and the extent to which their respective companies were able to reduce the lead time. The findings as shown in Figure 4.9 revealed that majority of the organizations were able to reduce the lead time to a high extent while majority were unable to enhance customer satisfaction. The findings imply that most of the companies could be upholding logistic aspects that reduce lead time but not focusing on those that enhance the customer satisfaction and this could lead to poor performance.



**Figure 4.9: Firm Performance**

#### 4.6 Factor Analysis

Factor analysis was carried out to show the strength of each factor (item/question) in the variables. The need for factor analysis is so as to show the contribution of each item in a variable to the overall variance of the said variable. Yammit (2012) argue that factor analysing is the best way for a researcher to establish the questions in a questionnaire that are likely to give a reliable outcome in the model analysis hence enhance the ability of the model to give a correct prediction. Factor analysis in this study is done systematically as per the study variables and the findings are as herein shown. According to Wiid and Diggins (2015), the rule of thumb in factor analysis is 0.40 where a factor with a factor loading

coefficient of less than 0.40 is ruled inappropriate and insignificant to be included in the final model analysis of the study. This is the threshold that was used in this study.

#### 4.6.1 Factor Analysis on Freight Management

To examine whether the data collected was adequate and appropriate for inferential statistical tests such as the factor analysis, regression analysis and other statistical tests, two main tests were performed namely; Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. For a data set to be regarded as adequate and appropriate for statistical analysis, the value of KMO should be greater than 0.5 (Field, 2000).

Findings in Table 4.10 showed that the KMO statistic was 0.612 which was significantly high; that is greater than the critical level of significance of the test which was set at 0.5 (Field, 2000). In addition to the KMO test, the Bartlett's Test of Sphericity was also highly significant (Chi-square = 614.364 with 36 degree of freedom, at  $p < 0.05$ ). The results of the KMO and Bartlett's Test are summarized in Table 4.10. These results provide an excellent justification for further statistical analysis to be conducted.

**Table 4.10: Freight Management KMO Sampling Adequacy and Bartlett's Sphericity Tests**

Kaiser-Meyer-Olkin Measure	0.612
Bartlett's Chi- Square	614.364
Bartlett's df	36
Bartlett's Sig.	0

Factor analysis was conducted after successful testing of validity and reliability using KMO coefficient and cronbach alpha results. Factor analysis was conducted using Principal Components Method (PCM) approach. The extraction of the factors followed the Kaiser Criterion where an Eigen value of 1 or more indicates a unique factor. Total Variance analysis indicates that the 10 statements on Freight Management can be factored into 1

factor. The total variance explained by the extracted factor is 69.577% as shown in Table 4.11.

**Table 4.11: Factor Analysis on Freight Management**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of	Cumulative	Total	% of	Cumulative
		Variance	%		Variance	%
1	4.283	42.829	42.829	4.283	42.829	42.829
2	1.416	14.16	56.989	1.416	14.16	56.989
3	1.259	12.588	69.577	1.259	12.588	69.577
4	0.947	9.469	79.046			
5	0.643	6.431	85.477			
6	0.519	5.19	90.667			
7	0.426	4.261	94.927			
8	0.293	2.93	97.857			
9	0.214	2.143	100			
10	1.53E-15	-1.53E-14	100			

Extraction Method: Principal Component Analysis.

Factor analysis was conducted on statements regarding Relational Behavior (Table 4.12) and all the ten statements attracted a coefficient of more than 0.4 hence were retained for further analysis. According to Rahn (2010) and Zandi (2006) a factor loading equal to or greater than 0.4 is considered adequate. This is further supported by Black (2002) who asserts that a factor loading of 0.4 has good factor stability and deemed to lead to desirable and acceptable solutions

**Table 4.12: Freight Management Total Variance Explained**

<b>Communalities</b>	<b>Extraction</b>
The company has embraced a tracking system for its trucks and other mobile equipment	0.605
The trace systems are monitored to ensure they are effective and up-to-date	0.77
There have been minimal cases of freight loss after the track systems are put in place	0.869
The company has embraced systems for managing fuel in all its vehicles	0.771
There are proper mechanisms of ensuring the fuel management systems is effectively utilized	0.772
Embracing systems for managing fuel has enabled the company to save on fuel wastage	0.651
The organization upholds effective scheduling of delivery routes	0.732
The fleet in our company are scheduled in a manner that saves on time and cost	0.719
The framework of scheduling fleet and routes has enabled our firm to enhance effectiveness	0.702

Extraction Method: Principal Component Analysis.

#### **4.6.2 Factor Analysis on Logistics Information System Management**

The KMO and Bartlett's Test of Sphericity are as shown in Table 4.13. The findings revealed that the Kaiser-Meyer-Olkin Measure had a statistic of 0.845. This is an indication that the data met the 0.50 threshold, hence the data was fit for factor analysis. This is also proved by the Bartlett's Test of Sphericity which shows a significant level of 0.000 which is less than the standard significant level of 0.05. This is an indication that the data could be ran for factor analysis.

**Table 4.13: Logistics Information System Management KMO Sampling Adequacy and Bartlett's Sphericity Tests**

Kaiser-Meyer-Olkin Measure	0.845
Bartlett's Chi- Square	465.491
Bartlett's df	36
Bartlett's Sig.	0. 0

Table 4.14 shows the results for variance analysis for the logistics information systems management. The findings indicated that a total of 4 factors could explain a variance of 75.371% which implies that the factors have the strongest significance in the variable. The results further indicated that a total of 10 factors could be narrowed down into one factor, thus enabling a regression analysis

**Table 4.14: Logistics Information System Management Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.413	34.127	34.127	3.413	34.127	34.127
2	1.661	16.608	50.735	1.661	16.608	50.735
3	1.356	13.563	64.298	1.356	13.563	64.298
4	1.107	11.073	75.371	1.107	11.073	75.371
5	0.968	9.678	85.05			
6	0.583	5.833	90.883			
7	0.393	3.928	94.811			
8	0.325	3.245	98.056			
9	0.194	1.944	100			
10	7.20E-16	7.20E-15	100			

Extraction Method: Principal Component Analysis.

Table 4.15 shows the factor analysis results. The findings revealed that the factor “The management of the organization has been committed on embracing information



technology in key supplier chain frameworks” had the least factor loading of 0.405, while the factor “The inventory levels and flow are appropriately controlled using the adopted system” had the highest factor loading of 0.885. This is an indication that they all met the threshold of 0.40 hence the factors were all adopted in the preceding analysis.

**Table 4.15: Logistics Information System Management Factor Analysis Component Matrix**

<b>Communalities</b>	<b>Extraction</b>
Our company has an active database for keeping all logistics information	0.634
The available database is designed in a secure and easily accessible manner	0.708
Through a well-managed and designed database, we are able to monitor the logistics of the company	0.698
Our company has an effective system for monitoring the inventory	0.877
The inventory levels and flow are appropriately controlled using the adopted system	0.885
The company through the management is committed towards embracing the best systems of managing inventory	0.751
The company has an active system for engaged and sharing information with suppliers	0.771
The product process in our company is monitored by effective systems	0.822
The management of the organization has been committed on embracing information technology in key supplier chain frameworks	0.405

### **4.6.3 Customer Relations Management**

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity were carried out to establish whether the data was suitable for factor analysis. The findings as shown in Table 4.16 revealed that the KMO statistic was 0.866. This is higher

than the 0.5 threshold, hence the data could be ruled to be suitable for factor analysis. The Bartlett's Test of Sphericity on the other hand showed a P-value of 0.000 which is lower than the 0.05 threshold. This is an indication that the data could significantly be factored out to give the appropriate factors for preceding analysis.

**Table 4.16: Customer Relations Management KMO and Bartlett's Sphericity Tests**

Kaiser-Meyer-Olkin Measure	0.866
Bartlett's Chi- Square	421.228
Bartlett's df	36
Bartlett's Sig.	0.000

Analysis of variance was carried out to establish the total variance explained by the factors in the variable. As the results in Table 4.17 reveal, a total of five factors explained up to 86.47% of the variance for the entire variable. Therefore, retaining the other four factors out of the nine factors would require a factor analysis for individual item, so as to establish whether they are within the threshold.

**Table 4.16: Customer Relations Management Total Variance Explained**

Component	Initial			Extraction Sums of Squared		
	Eigenvalues			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.259	36.215	36.215	3.259	36.215	36.215
2	1.312	14.581	50.797	1.312	14.581	50.797
3	1.16	12.892	63.689	1.16	12.892	63.689
4	1.046	11.627	75.316	1.046	11.627	75.316
5	1.004	11.16	86.476	1.004	11.16	86.476
6	0.506	5.617	92.093			

Component	Initial			Extraction Sums of Squared		
	Eigenvalues			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
7	0.362	4.021	96.114			
8	0.312	3.465	99.58			
9	0.038	0.42	100			

Extraction Method: Principal Component Analysis.

Factor analysis results are as shown in Table 4.18. As the findings revealed, the factor (The company has a policy for recalling any products that are delivered to the customers without meeting the expectations), had the lowest factor loading of 0.736 while the factor “The management of our company has been committed towards enhancing the relations of the customers and quality services/products” had the highest factor loading of 0.986. This implies that all the factors met the threshold of 0.40 hence the factors were used for preceding analysis in the study.

**Table 4.18: Customer Relations Management Factor Analysis Component Matrix**

Communalities	Extraction
The company has an active platform for sharing information with the customers	0.807
The customers are given feedback to their queries timely	0.915
There are approaches where employees can share their views to any individual within the company	0.837
The products are designed and produced as per the customer specifications	0.928
The company upholds value adding the products and services to exceed the customer expectations	0.971
Product returns and recalls management the customers are involved in every stage of delivering their orders	0.812
The customers are always free to return any products that do not meet their specifications	0.791

Communalities	Extraction
The company has a policy for recalling any products that are delivered to the customers without meeting the expectations	0.736
The management of our company has been committed towards enhancing the relations of the customers and quality services/products	0.986

Extraction Method: Principal Component Analysis.

#### 4.6.4 Factor Analysis on Product Packaging

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were carried out to establish the ability of the data to undergo factor analysis. The value of KMO should be greater than 0.5 for a data set to be regarded as adequate and appropriate for statistical analysis. Findings in Table 4.19 showed that the KMO statistic was 0.751 which was significantly high; that is greater than the critical level of significance of the test which was set at 0.5. The Bartlett's Test of Sphericity was also highly significant (Chi-square = 565.239 with 36 degree of freedom, at  $p < 0.05$ ). The results of the KMO and Bartlett's test revealed that the items met the threshold, hence the data was suitable for factor analysis.

**Table 4.17: Product Packaging KMO Sampling Adequacy and Bartlett's Sphericity Tests**

Kaiser-Meyer-Olkin Measure	0.751
Bartlett's Chi- Square	565.239
Bartlett's df	36
Bartlett's Sig.	0.000

The extraction of the factors was established using total variance explained analysis. The results as shown in Table 4.20 revealed that a total of 3 items had a cumulative variance explained of 73.44%. This implies that other six items only accounted for 26.6%. Retaining

these items in the preceding analysis for the variable would require a factor analysis for individual items.

**Table 4.18: Product Packaging Total Variance Explained**

<b>Total Variance Explained</b>						
Component	Initial			Extraction Sums of Squared		
	Eigenvalues			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.585	39.833	39.833	3.585	39.833	39.833
2	1.637	18.19	58.024	1.637	18.19	58.024
3	1.388	15.419	73.443	1.388	15.419	73.443
4	0.737	8.193	81.636			
5	0.612	6.798	88.435			
6	0.427	4.748	93.183			
7	0.287	3.186	96.369			
8	0.274	3.049	99.417			
9	0.052	0.583	100			

Extraction Method: Principal Component Analysis.

Factor analysis was conducted on statements regarding product packaging. The findings are as shown in Table 4.21. The findings revealed that the factors “The company adopts product designs that ensure the product is protected from any external damage “had the least factor loading of 0.574 while the highest factor loading was on factor “Most of the customers in our company are familiar with our products’ brand” which had a factor loading of 0.877. This implies that all the factors had factor loading higher than the 0.40 threshold, hence they were all retained for subsequent analysis.

**Table 4.19: Product Packaging Factor Analysis Component Matrix**

<b>Communalities</b>	<b>Extraction</b>
The packaging materials used in our products are not harmful to individuals or environment	0.759
The company adopts product designs that ensure the product is protected from any external damage	0.574
The designs used in packaging enhance in order to be appealing to the customers	0.777
Our company's products are labelled appropriately to capture all the required information	0.822
The information given when describing our products is truthful and adequate	0.718
The labels used are coherent with our customers language and level of understanding	0.717
Our products are branded in clear design that customers are able to distinguish	0.749
The branding of the company's products is consistent across all the categories of the products	0.616
Most of the customers in our company are familiar with our products' brand	0.877

Extraction Method: Principal Component Analysis.

#### **4.6.5 Factor Analysis on Internal Policy Framework**

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity to examine whether the data collected was adequate and appropriate for the factor analysis. For a data set to be regarded as adequate and appropriate for statistical analysis, the value of KMO should be greater than 0.5. As the findings in Table 4.22 show, the KMO statistic was 0.845 which was higher than the 0.50 threshold. On the other hand, the Bartlett's Test of Sphericity was significant (Chi-square = 0.751 with 36 degree of freedom, at  $p < 0.05$ ). This rules in that the data was viable for factor analysis.

**Table 4.20: Internal Policy Framework KMO and Bartlett's Sphericity Tests**

Kaiser-Meyer-Olkin Measure	0.751
Bartlett's Chi- Square	565.239
Bartlett's df	36
Bartlett's Sig.	0

An analysis for the variance was carried out to establish the variance explained by each individual item under the internal policy framework. Table 4.23 shows the findings. As the results portray, only two items explained a cumulative variance of 57.10%, with the other seven factors explaining the remaining 43%. To further determine which factors to retain for subsequent analysis in the study, factor analysis was carried out.

**Table 4.21: Internal Policy Framework Total Variance Explained**

<b>Total Variance Explained</b>							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance		Cumulative %
					%	%	
1	3.608	40.086	40.086	3.608	40.086	40.086	40.086
2	1.532	17.023	57.109	1.532	17.023	57.109	57.109
3	0.992	11.022	68.131				
4	0.916	10.176	78.307				
5	0.746	8.292	86.599				
6	0.493	5.477	92.076				
7	0.403	4.475	96.552				
8	0.239	2.651	99.203				
9	0.072	0.797	100				

Extraction Method: Principal Component Analysis.

Table 4.24 shows the results for the factor analysis was conducted on statements regarding operations and processes and assess the items that attracted a coefficient of more than 0.4. As the results portray, two items had factor loadings of less than 0.40 with the first factor “Our company is always alert on changes in policies and regulations” having a factor loading of 0.101 and the factor “the level of our company’s control in fourth party logistics has been high” having a factor loading of 0.306. The two items were deleted from the data set in the preliminary analysis, since they do not meet the threshold.

**Table 4.22: Internal Policy Framework Factor Analysis Component Matrix**

<b>Communalities</b>	<b>Extraction</b>
Our company is always alert on changes in policies and regulations	0.101
The company through the management always ensures that there are policies on supply chain processes	0.489
The company has emphasized on carrying out logistics with partners who have adhered to the existing policies	0.514
The company always ensures that there is a control framework for the logistics operations	0.565
The level of our company’s control in fourth party logistics has been high	0.306
The management has set out a standard for adhering to the existing logistics policies	0.738
There is a significant level of transparency between our company and its logistics partners	0.754
The company frequently carries out assessments to ensure internal policies align with fourth party logistics partners	0.784



<b>Communalities</b>	<b>Extraction</b>
Through adherence to the existing policies in logistics, the company has enhanced its effectiveness	0.888

Extraction Method: Principal Component Analysis.

#### **4.7 Diagnostic Tests**

The researcher conducted various diagnostic tests to ensure that the assumptions of Classical Linear Regression Model (CLRM) were not violated. Estimating the regression models when the CLRM assumptions are violated would result in inefficient, inconsistent and biased parameter estimates (Franzese & Kam, 2009). This section presents the results of the following diagnostic tests: linearity test, normality test, multicollinearity test and autocorrelation test.

##### **4.7.1 Normality Test**

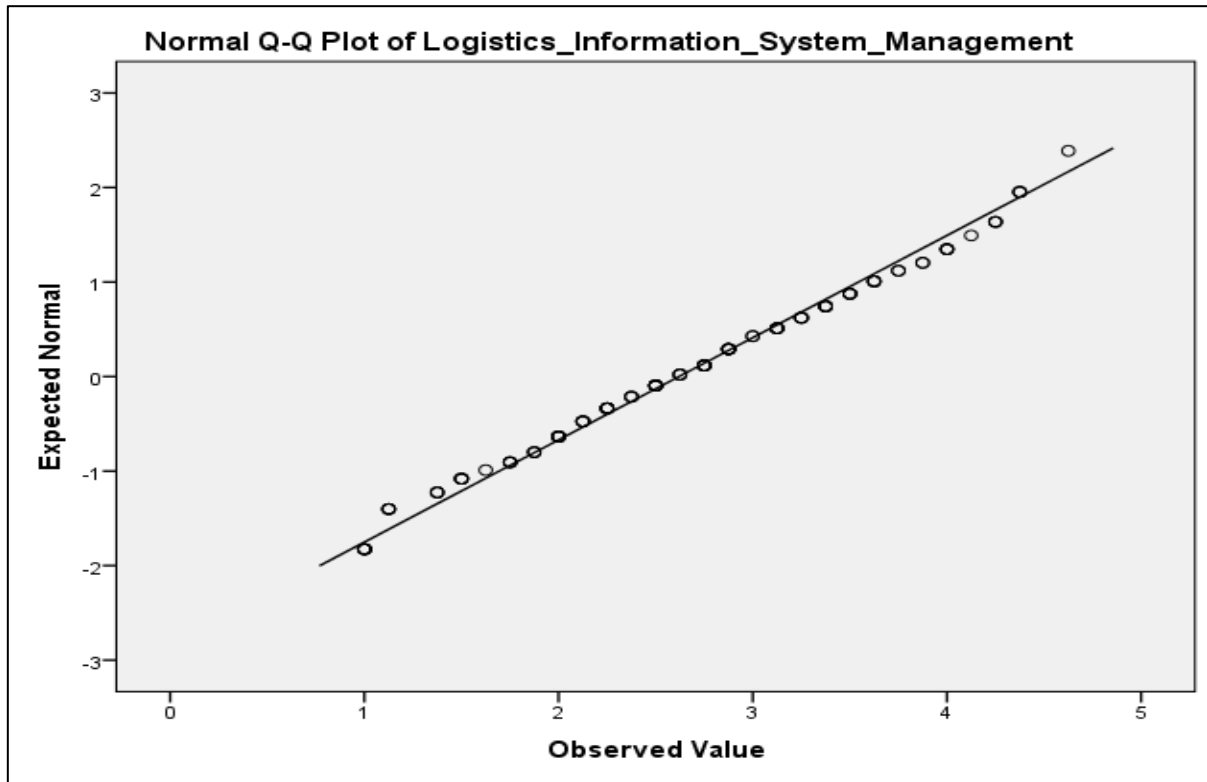
Normality can be defined as the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution, the benchmark for statistical methods (Hair et al., 2010). Normality is one of three assumptions for multivariate analysis. Regression assumes normality between the variables under analysis (Hair et al., 2010). Skewness and kurtosis measures of the distributions should be calculated (Tabachnick & Fidell, 2007).

Many of the statistical procedures in parametric tests are based on the assumptions that the data follows a normal distribution (Ghasemi & Zahediasl, 2012). The normal distribution peaks in the middle and is symmetrical about the mean. Data does not need to be perfectly normally distributed for the tests to be reliable. According Ghasemi and Zahediasl (2012), Kolmogorov-Smirnov (K-S) test is the most popular and appropriate test for normality test. A Normally distributed data when using Kolmogorov-Smirnov should have a significant value of above the standard value of 0.05 to exemplify that the variable under consideration is not statistically significant to normal distribution. Table 4.25 shows all variables with the distribution of the variables of the study with reference to K-S test. The findings show that the variables have significance values higher than 0.05 thus implying that they are normally distributed.

**Table 4.23: Kolmogorov-Smirnov Test for Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Freight Management	.087	117	.031	.950	117	.107
Logistics Information System Management	.057	117	.200*	.977	117	.143
Customer Relations Management	.244	117	.102	.867	117	.090
Product Packaging	.331	117	.403	.826	117	.112
Internal Policy Framework	.115	117	.171	.956	117	.411
Firm Performance	.069	117	.200*	.982	117	.111

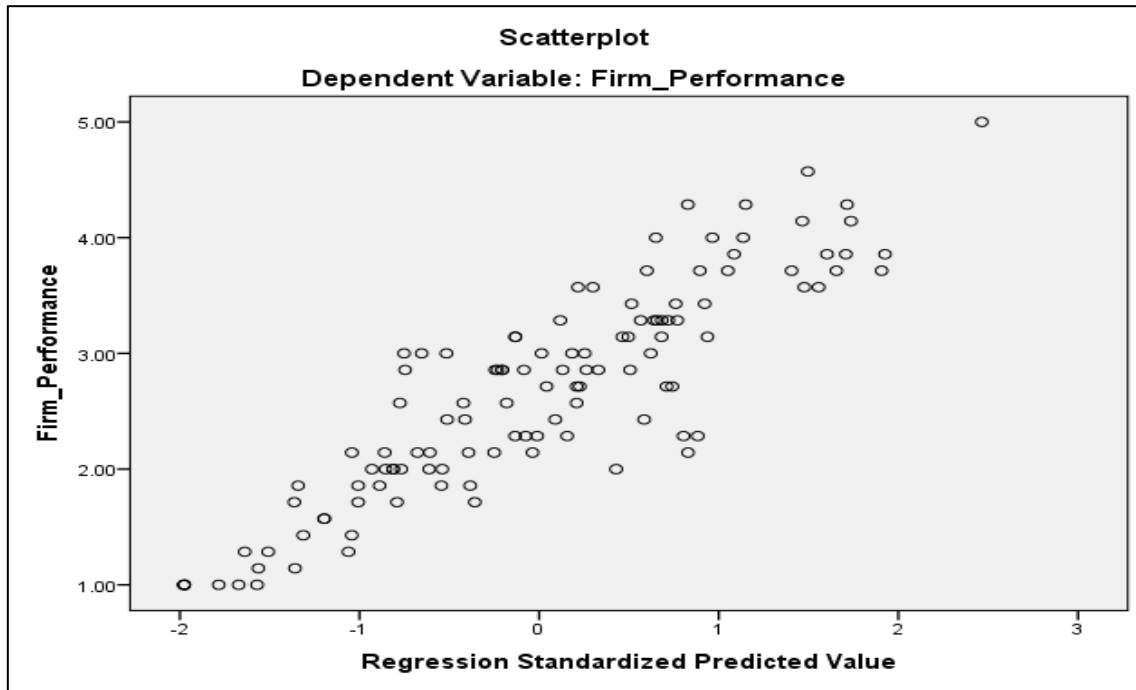
Q-Q Plot was used to test for the normality distribution in the study variables. The findings as shown in Figure 4.10 indicated that the points on the plot formed a linear pattern passing through the origin with a unit slope. It is visually clear that the residuals were normally distributed and therefore, the model could be applied in the analysis (Brooks, 2008).



**Figure 4.10: Q-Q Plot for Normality Test**

#### **4.7.2 Test for Heteroscedasticity**

Homoscedasticity assumes that there is constant variance of the errors. Heteroscedasticity, which is a violation of homoscedasticity makes it problematic to measure the true forecast errors' standard deviation, and too narrow or too wide are usually the result. A plot of residuals versus predicted values was used to check for the convergence. From the scatter plot below, it is evident that there is no heteroscedasticity from the data set in that the plots do not take a given shape and there is a positive trend in the flow of the scatters.



**Figure 4.11: Scatter Plot for Heteroscedasticity**

#### **4.7.3 Test for Multicollinearity**

Multicollinearity exists when the standard errors of estimated coefficients of two or more independent variables are inflated (Simon, 2004). To test for multicollinearity the study adopted Variance Inflation Factor (VIF) approach to test for multicollinearity. This study adopted the rule of thumb for VIF value of 10 as the threshold (Neter, Kutner, Wasserman and Nachtsheim, 1996; Porter and Gujarat, 2010). The VIF values of greater than 10 would indicate presence of multicollinearity. These results as indicted in Table 4.26 revealed that the VIF values of the independent variables were within the threshold of 10 (ten). The tolerance value was greater than 0.1 ruling out the possibility of multicollinearity (Field, 2009). The result, therefore implied non- existence of a multicollinearity problem among the independent variables and hence the level of multicollinearity in the model could be tolerated. The multicollinearity diagnosis indicated that there was no threat of multicollinearity problem and therefore, all the independent variables could be used for further analysis using the regression model. A VIF of less than five and tolerance greater than 0.2 are recommended and in the study, values for tolerance and VIF were within an acceptable range.

**Table 4.24: Results for Multicollinearity Test**

<b>Variables</b>	<b>Tolerance</b>	<b>VIF</b>
Freight Management	.707	1.415
Logistics Information System Management	.673	1.485
Customer Relations Management	.849	1.178
Product Packaging	.733	1.363
<b>Mean Tolerance/VIF</b>	<b>0.7405</b>	<b>1.36025</b>

#### 4.7.4 Correlation Analysis

A correlation analysis was carried out using Pearson correlation coefficients. The linearity test is the assumption that the independent variables are uncorrelated. The rule of thumb is that independent variables should not be highly correlated and there should be correlated with the dependent variable. When the Pearson Correlation coefficient of below 0.50 shows weak linearity between independent variables which is acceptable in a regression model while correlation coefficient of 0.70 and above shows strong linearity between independent variables which is not acceptable in a regression model. The findings as shown in Table 4.28 revealed that the independent variables had Pearson correlation coefficients of less than 0.50 an indication that the linearity was weak between the independent variables hence the analysis was carried out.

From the findings, the correlation between freight management and firm performance was found to have a Pearson Correlation coefficient ( $r$ ) of 0.702 implying that freight management has a strong correlation with the performance of food and beverage manufacturing firm in Kenya. Moreover, logistics information systems management had a Pearson correlation coefficient ( $r$ ) of 0.600 implying that logistics information systems management had a strong correlation with the performance of food and beverage manufacturing firm in Kenya. The customer relationship management had a Pearson

correlation coefficient (r) of 0.561 implying that customer relationship management had a strong correlation with performance of food and beverage manufacturing firm in Kenya. Product packaging had a Pearson correlation coefficient (r) of 0.642. This is an implication that product packaging had a strong relationship with performance of food and beverage manufacturing firm in Kenya.

**Table 4.25: Linearity Test**

	<b>Firm Performanc e</b>	<b>Freight Managemen t</b>	<b>Logistics Information System Managemen t</b>	<b>Customer Relations Managemeng</b>	<b>Product Packagin g</b>	<b>Internal Policy Framework k</b>
Firm Performanc e	Pearson Correlatio n Sig. (2- tailed) N 117					
Freight Managemen t	Pearson Correlatio n Sig. (2-.000 tailed) N 117	.702** 1				
Logistics Information System Managemen t	Pearson Correlatio n Sig. (2-.000 tailed) N 117	.600**	.442** 1			

		<b>Firm Performanc e</b>	<b>Freight Managemen t</b>	<b>Logistics Information System Management</b>	<b>Customer Relations Managemeng t</b>	<b>Product Packagin g</b>	<b>Internal Policy Framewor k</b>
Customer Relations Managemen t	Pearson Correlatio n Sig. (2-tailed) N	.561** (2-.000)	.233* .012	.378** .000	1 .156		
Product Packaging	Pearson Correlatio n Sig. (2-tailed) N	.642** (2-.000)	.458** .000	.411** .000	.132 .156	1	
Internal Policy Framework	Pearson Correlatio n Sig. (2-tailed) N	-.003 (2-.972)	.014 .878	.005 .954	-.066 .481	.028 .767	1 117

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

#### 4.8 Regression Analyses

The research used multiple regression analysis to determine the linear statistical relationship between the independent and dependent variables of this study. According to Young (2014), regression analysis helps to explain the statistical relationship between variables thus enhancing the ability of the study to make substantive conclusions and recommendations.

The statistical objective of regression analysis is to show high  $R^2$  and significant t-values, thus rejecting the null hypothesis of no influence. Parameters with an absolute t-value greater than 1.96 indicate a significance level of 0.05 (i.e.  $p < 0.05$ ). The entire six null hypotheses as stated in chapter one of this study were tested using regression models.

#### 4.8.1 Freight Management

The study sought to establish the influence of freight management on the performance of food and beverage manufacturing firms in Kenya. From this, the first hypothesis of the study was drawn:

*H<sub>01</sub>: Freight management has no significant influence on performance of food and beverage manufacturing firms in Kenya.*

To test for this hypothesis, a univariate regression model was adopted. The model was of the form:

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

Model summary, Analysis of Variance (ANOVA), and regression coefficients were used to show whether to reject or accept the hypothesis. The results are as shown in Table 4.29.

As the model summary results reveal, the  $R^2$  for the model was 0.493. This implies that the variation in the performance of the food and beverage processing firms can be explained by up to 48.8% as a result of freight management. This shows that there is a possibility for freight management to significantly influence the performance of the firms. However, this is confirmed further by the ANOVA analysis.

The ANOVA results on the other hand show that at a F-statistic of 111.606, the significance of the model is at 0.000. This being less than the standard P-value of 0.05, the study draws that the model can significantly predict the relationship between freight management and the performance of food and beverage processing firms in Kenya.

The regression coefficient results are also shown. The results reveal that the Beta ( $\beta$ ) coefficient for the freight management is 0.560. From the results, the model can now be presented as follows:

$$Y = 1.141 + 0.560X_1 + e$$

The findings imply that a unit change in freight management can influence up to 56% of the performance of food and beverage processing firms. Further, the results show that the P-



value for the model is 0.000 which is less than the standard p-value of 0.05. This implies that there is a significant relationship between freight management and the performance of food and beverage processing firms. The study therefore rejects the null hypothesis that freight management has no significant influence on the performance of food and beverage processing firms in Kenya, and accepts the alternative hypotheses that freight management has a significant influence on the performance of food and beverage manufacturing companies in Kenya. The findings are in line with those by Ketokivi, and Schroeder (2014) who established that freight management in the manufacturing sector was an essential supply chain driver that streamlined and enhanced the management of the logistics thus enhancing firm performance.

**Table 4.26: Regression Model Results on Freight Management**

**Model Summary**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.702 <sup>a</sup>	.493	.488	.65815

a. Predictors: (Constant), Freight Management

**ANOVA**

<b>Model</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
	Regression	48.343	1	48.343	111.606	.000 <sup>b</sup>
1	Residual	49.813	115	.433		
	Total	98.156	116			

a. Dependent Variable: Firm Performance

b. Predictors: (Constant), Freight Management

### Regression Coefficients

	Model	Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	1.141	.157		7.277	.000
	Freight Management	.560	.053	.702	10.564	.000

a. Dependent Variable: Firm Performance

### 4.8.2 Logistics Information Systems Management

The study sought to assess the influence of logistics information systems management on the performance of food and beverage manufacturing firms in Kenya. From this objective, the second hypothesis of the study was drawn:

*H<sub>02</sub>: Logistics information system management does not significantly influence the performance of food and beverage manufacturing firms in Kenya.*

Model summary, ANOVA test, and regression coefficients were used to display the results on the regression model for the second hypothesis of the study. The model was as follows:

$$Y = \beta_0 + \beta_2 X_2 + e$$

The model summary results as shown in Table 4.30 revealed that the R-square(R<sup>2</sup>) for the model was 0.360. This implies that logistics information system management has 36% impact on the variation in the performance of food and beverage processing firms in Kenya.

The ANOVA results on the other hand revealed that the F-statistic was 64.617 at a significant level of 0.000. This being less than the standard P-value of 0.05, the findings imply that the model could significantly predict the relationship between logistic information system management and the performance of food and beverage processing firms in Kenya.

The regression model results revealed that the  $\beta$  for the variable (logistics information system management) was 0.597. From the findings, the following model can be deduced:

$$Y = 1.105 + 0.597X_2 + e$$

The results imply that when regressed alone with the dependent variable (performance of food and beverage processing firms), a unit change in logistics information systems management would influence up to 59.7% of the performance of food and beverage processing firms in Kenya. The P-value for the variable in the model was 0.000 which implies that being less than the standard p-value of 0.05, logistics information systems management has a significant and positive influence on the performance of food and beverage processing firms in Kenya. The findings compare with what has been indicated Fabbe-Costes, Jahre, and Roussat (2014) that integrating logistics information systems management is a core function in fourth party logistics that steers the flow of information and how logistics are effectively delivered for continued customer satisfaction and organizational performance.

**Table 4.27: Regression Results on Logistics Information System Management**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.600 <sup>a</sup>	.360	.354	.73924

a. Predictors: (Constant), Logistics Information System Management

**ANOVA**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	35.312	1	35.312	64.617	.000 <sup>b</sup>
1 Residual	62.845	115	.546		
Total	98.156	116			

a. Dependent Variable: Firm Performance

b. Predictors: (Constant), Logistics Information System Management

### Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
	(Constant)	1.105	.206	5.361	.000	
1	Logistics Information System Management	.597	.074	.600	8.038	.000

a. Dependent Variable: Firm Performance

### 4.8.3 Customer Relations Management

The third objective of the study was to assess the influence of customer relationship management as one of the services by the fourth party logistics on the performance of food and beverage manufacturing companies in Kenya. Based on this objective, the study had a hypothesis that:

*H<sub>03</sub>: Customer relations management has no significant influence on performance of food and beverage manufacturing firms in Kenya.*

$$Y = \beta_0 + \beta_3 X_3 + e$$

The regression model was used to test for this hypothesis. The findings were presented in model summary, ANOVA test and regression coefficients. The findings are as shown in Table 4.31.

The findings from the model summary revealed that the R<sup>2</sup> for the third null hypothesis was 0.315. This indicates that the variation of performance of food and beverage processing firms as a result of customer relations management is 31.5%. This is an indication that customer

relations management could be a significant factor influencing the performance of the food and beverage processing firms in Kenya.

The ANOVA results on the other hand revealed that at a F-statistic of 52.798, the P-value for the model is 0.000. This being lower than the standard p-value of 0.05, the study can deduce that the model can significantly predict the relationship between the customer relations management and the performance of food and beverage processing firms.

The regression coefficients were also used to depict the relationship between the two variables. The findings as shown revealed that the Beta ( $\beta$ ) coefficient for the variable was 0.370. The model now becomes as herein shown:

$$Y = 1.650 + 0.370X_3 + e$$

The findings imply that a unit change in customer relations management would influence up to 37% of the performance of food and beverage processing firms in Kenya. The findings also show that the P-value for the variable is 0.000 which is less than the standard p-value of 0.05 implying that a customer relations management has a significant influence on the performance of food and beverage processing firms in Kenya. To this end, the third null hypothesis is thus rejected, and the alternative hypothesis that customer relations management has a significant influence on the performance of food and beverage manufacturing companies in Kenya accepted. According to Buyukozkan et al. (2015), upholding customer relations in a fourth part logistics is essential in promoting the performance of the supply chain and enhancing the competitiveness of modern organizations.

**Table 4.28: Regression Results on Customer Relations Management**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.561 <sup>a</sup>	.315	.309	.76483

a. Predictors: (Constant), Customer Relations Management

**ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	30.885	1	30.885	52.798	.000 <sup>b</sup>
1	Residual	67.271	115	.585		
	Total	98.156	116			

a. Dependent Variable: Firm Performance

b. Predictors: (Constant), Customer Relations Management

**Regression Coefficients**

Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
		B	Beta	Std. Error	
	(Constant)	1.650		.157	10.516 .000
1	Customer Relations Management	.370	.561	.051	7.266 .000

a. Dependent Variable: Firm Performance

#### 4.8.4 Product Packaging

The study assessed the influence of product packaging on the performance of food and beverage manufacturing companies in Kenya. From this objective, the fourth null hypothesis of the study was drawn:

*H<sub>04</sub>: Product packaging has no significant influence on the performance of food and beverage manufacturing firms in Kenya*

The hypothesis was tested using regression model through the model summary, ANOVA test, and the regression coefficients. The findings are as shown in Table 4.32.

As the model summary results portray, the R-square (R<sup>2</sup>) value was 0.413. This is an indication that product Packaging could influence up to 41.3% of the variation in the performance of food and beverage processing firms in Kenya. The findings therefore provide a basis of there being a relationship between product Packaging and the performance of food and beverage processing firms.

The ANOVA results on the other hand revealed that at the F-statistic of 80.748, the P-value for the model was at 0.000. This is lower than the standard p-value of 0.05. This therefore implies that the model has the probability of predicting the relationship between product Packaging and the performance of food and beverage processing firms.

The Regression coefficients are as shown. The results reveal that the Beta coefficient for the variable –product Packaging is 0.466. The results from the regression coefficients also portray the model as shown:

$$Y = 1.420 + 0.466X_4 + e$$

The results imply that a unit change in product Packaging would influence up to 46.6% of the performance of food and beverage processing firms in Kenya. The P-value on the other hand show that the variable has a P-value (0.00) less than the p-value of 0.05. This therefore implies that product Packaging has a significant influence on the performance of food and beverage processing firms. This leads to the decision to reject the null hypothesis of the study

that product Packaging has no significant influence on the performance of food and beverage processing firms in Kenya. Therefore, the alternative hypothesis is accepted that product packaging has a significant influence on the performance of food and beverage manufacturing companies in Kenya. The findings compare with the argument by Lieb and Butner (2013) who established that logistics management is about ensuring that the right products get to the customers and this can be obtained through continued improvements in product designing and labelling.

**Table 4.29: Regression Results on Product Packaging**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.642 <sup>a</sup>	.413	.407	.70813

a. Predictors: (Constant), Product Packaging

**ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	40.490	1	40.490	80.748	.000 <sup>b</sup>
1	Residual	57.666	115	.501		
	Total	98.156	116			

a. Dependent Variable: Firm Performance

b. Predictors: (Constant), Product Packaging

**Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.429	.153		9.360	.000
	Product Packaging	.466	.052	.642	8.986	.000

a. Dependent Variable: Firm Performance



#### **4.8.5 Multiple Regression Model**

The study carried out multiple regression model analysis (multivariate) to establish the combined effect of the fourth-party logistics aspects (Product Packaging, Customer Relations Management, Freight Management, Logistics Information System Management) on the performance of food and beverage processing firms in Kenya. The findings are shown as per the model summary, ANOVA test and the regression coefficients. Table 4.33 shows the findings.

The Model Summary result revealed that the R-square for the model is 0.795. This implies that when combined, Product Packaging, Customer Relations Management, Freight Management, Logistics Information System Management can lead up to 79.5% variation of the performance of food and beverage processing firms in Kenya.

The ANOVA results are as also as shown. The results revealed that the F-statistic for the model as 108.447 at a significant level of 0.000. This being less than the standard p-value of 0.05 implies that the model could significantly predict the relationship between Product Packaging, Customer Relations Management, Freight Management, Logistics Information System Management and the performance of food and beverage processing firms in Kenya. The regression coefficients results are also as herein shown. The results lead to the following model:

$$Y = 0.93 + 0.311X_1 + 0.140X_2 + 0.244X_3 + 0.259X_4 + \epsilon$$

The findings imply that a unit change in freight management influences up to 31.1% of the performance of food and beverage manufacturing firms in Kenya. A unit change in logistics information system management on the other hand influences up to 14% of the performance of food and beverage manufacturing firms in Kenya while a unit change in customer relations management influences up to 24.4% of the performance of food and beverage manufacturing firms in Kenya. A unit change in product Packaging influences up to 25.9% increase in the performance of food and beverage manufacturing firms in Kenya.

**Table 4.30: Multiple Regression Model Results (Unmoderated)****Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.892 <sup>a</sup>	.795	.787	.42408

**ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	78.014	4	19.503	108.447	.000 <sup>b</sup>
1	Residual	20.142	112	.180		
	Total	98.156	116			

a. Dependent Variable: Firm Performance

**Regression Coefficients**

Model		Unstandardized Coefficients	Standardized Coefficients		Sig.
		B	Std. Error	Beta	
	(Constant)	.093	.135		.687
	Freight Management	.311	.041	.390	7.658
1	Logistics Information System Management	.140	.052	.141	2.702
	Customer Relations Management	.244	.031	.370	7.957
	Product Packaging	.259	.036	.357	7.140

a. Dependent Variable: Firm Performance

**4.8.6 Moderated Model**

The study sought to establish the moderating effect of internal policy framework on the relationship between fourth party logistics services (freight management, logistics

information systems, customer relationship management and product packaging) and the performance of food and beverage manufacturing companies in Kenya. From the objective, the following null hypothesis was drawn:

*H<sub>05</sub>: Internal Policy framework does not significantly moderate the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya.*

The model for the moderating effect was:

$$Y = \beta_0 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + \beta_4 X_4 * Z + \epsilon$$

Where Z is the moderator (Internal Policy Framework), X<sub>1</sub> – X<sub>4</sub> are the independent variables

The R<sup>2</sup> for the overall model before the moderation was 0.795 and after the moderator, it was increased to 0.872. This is an implication that following the introduction internal policy framework as the moderator, the strength of the four aspects of fourth-party logistics management towards the variation of the performance of the food and beverage processing companies increased by 0.077 equivalent to 7.7%. This is an indication that internal policy framework has a moderating effect on the combined effect of product Packaging, customer relations management, freight management, logistics information system management.

The ANOVA results on the other hand revealed that following the introduction of the moderator, the model was statistically significant at a F-statistic of 150.589 and a P-value of 0.000 < 0.05. The regression coefficients are also as shown. From the coefficients, the new model now becomes:

$$Y = 0.325 + 0.442X_1 + 0.422X_2 + 0.391X_3 + 0.0950X_4$$

The findings imply that the moderator (internal policy framework) had a moderating effect on the relationship between fourth party logistics services (product Packaging, customer relations management, freight management, logistics information system management) and the performance of food and beverage processing firms. However, the findings revealed that internal policy framework has no direct relationship with the performance of food and

beverage processing companies. The P-value under the regression coefficients however revealed that internal policy framework on logistics information system management was insignificant.

**Table 4.31: Results of the Overall Moderated Model (Moderated)**

*Model Summary*

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.934 <sup>a</sup>	.872	.866	.37646

a. Predictors: (Constant), Internal policy framework, Logistics Information\*Internal policy framework, Product Packaging\*Internal policy framework, Customer Relations Management\*Internal Policy framework, Freight Management\*Internal policy framework

*ANOVA*

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	
1	Regression	106.709	5	21.342	150.589	.000 <sup>b</sup>
	Residual	15.731	111	.142		
	Total	122.440	116			

a. Dependent Variable: Performance

b. Predictors: (Constant), Internal policy framework, Logistics Information\*Internal policy framework, Product Packaging\*Internal policy framework, Customer Relations Management\*Internal policy framework, Freight Management\*Internal policy framework

*Regression Coefficients*

<b>Model</b>	<b>Unstandardized Coefficients</b>	<b>Standardized Coefficients</b>	<b>t</b>	<b>Sig.</b>
	<b>B</b>	<b>Std. Beta</b>	<b>Error</b>	

(Constant)	.325	.224		1.449	.150
Freight Management* Internal policy framework	.442	.046	.445	9.588	.000
Logistics Information* Internal policy framework	.095	.046	.082	2.065	.031
Customer Relations Management* Internal policy framework	.391	.040	.386	9.769	.000
Product Packaging* Internal policy framework	.422	.043	.404	9.702	.000

a. Dependent Variable: Performance

#### 4.0 Hypotheses Testing

The hypotheses for this study were tested as summarized in Table 4.10 below. On the first hypothesis that freight management had no significant influence on performance of food and beverage manufacturing firms in Kenya, it was established that the P-value was  $0.000 < 0.05$ , thus the hypothesis was rejected. The second hypothesis that logistics information systems management had no significant relationship with performance of food and beverage manufacturing firms in Kenya, the P-value of  $0.000 < 0.05$  implied that logistics information systems management had a significant relationship with performance of food and beverage manufacturing firms in Kenya, hence the hypothesis was rejected. This was also the case for the third and fourth hypotheses, where the results revealed that the P-values were less than the standard P-value of 0.05, hence the hypotheses rejected.

**Table 4.10: Hypotheses Testing Results**

<b>Hypothesis</b>	<b>R<sup>2</sup></b>	<b>Beta</b>	<b>P- Value</b>	<b>Decision</b>
H <sub>01</sub> : Freight management has no significant influence on performance of food and beverage manufacturing firms in Kenya.	0.493	0.560	0.000	Reject the Null Hypothesis
H <sub>02</sub> : Logistics information system management does not significantly influence the performance of food and beverage manufacturing firms in Kenya	0.360	0.597	0.000	Reject the Null Hypothesis
H <sub>03</sub> : Customer relations management has no significant influence on performance of food and beverage manufacturing firms in Kenya	0.315	0.370	0.000	Reject the Null Hypothesis
H <sub>04</sub> : Product Packaging has no significant influence on the performance of food and beverage manufacturing firms in Kenya	0.413	0.466	0.000	Reject the Null Hypothesis
H <sub>05</sub> : Internal policy framework does not significantly moderate the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya	0.872		0.000	Reject the Null Hypothesis

#### **4.10 Optimal Model**

From the optimal model, the following revised conceptual framework has been drawn. The conceptual framework shows the flow of variables as per the findings from the overall model. The variables are arranged systematically based on their influence to the dependent variable (performance of the food and beverage processing firms). The variable with the highest Beta coefficient has the strongest influence on the performance. Figure 4.12 shows the revised conceptual framework.

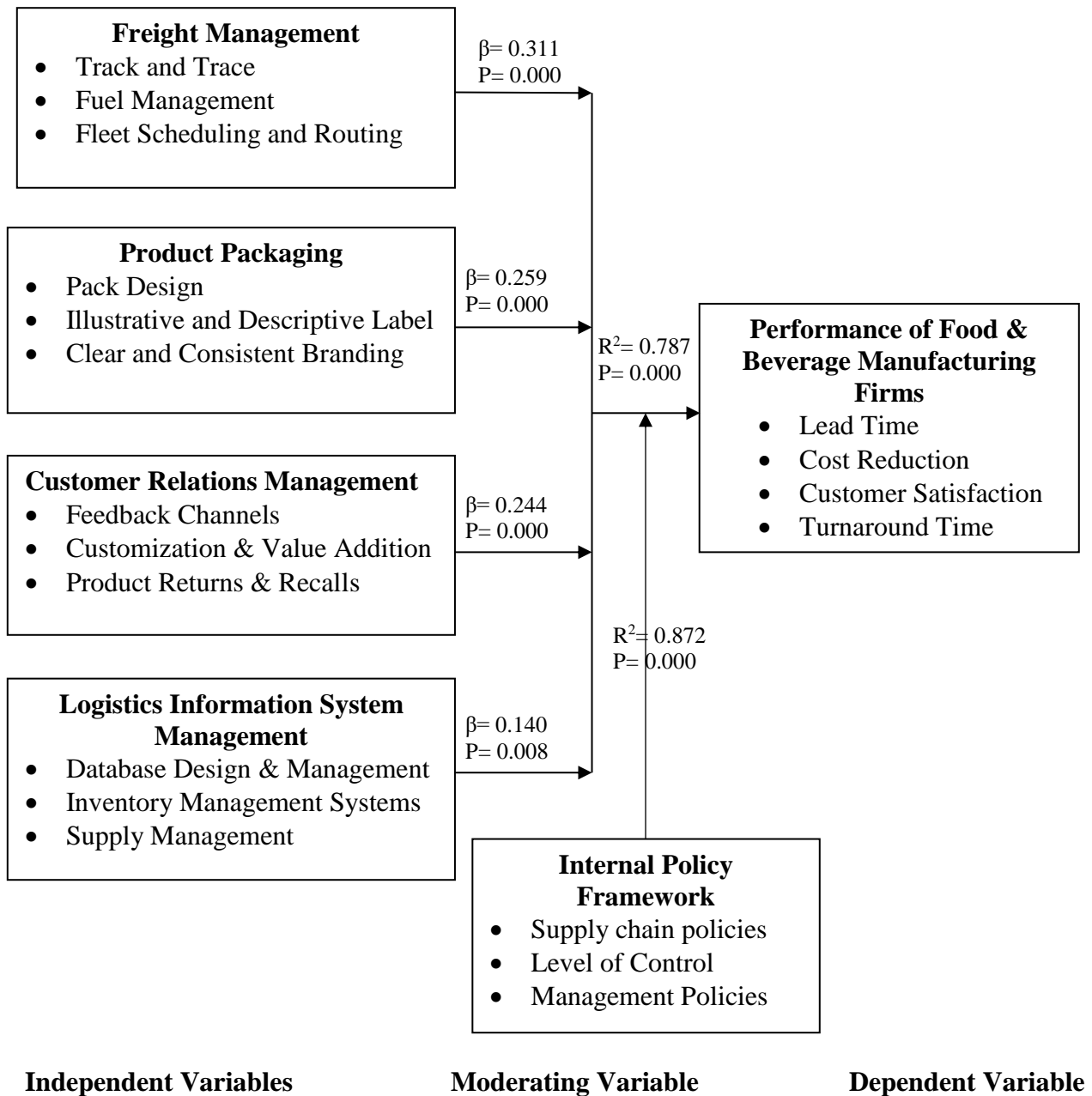


Figure 4.12: Revised Conceptual Framework

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the findings of the study on the relationship between fourth party logistics and performance of food and beverage manufacturing firms in Kenya. The chapter also captures the conclusions and recommendations. This was done in line with the objectives of the study. Areas of further research were suggested and contributions of the study to the existing knowledge were also captured.

#### **5.2 Summary of Findings**

The study sought to establish the relationship between fourth party logistics services on the performance of food and beverage manufacturing firms in Kenya. The study sought to establish the role played by freight management, logistics information systems management, customer relations management and product packaging on the performance of food and beverage manufacturing firms in Kenya. The study obtained a response rate of 89% which was considered adequate for analysis and making conclusions and recommendations in the study. The demographic results revealed that most of the firms had been in operation for a period of over ten years, and majority dealt with between one and seven products. The results implied that the firms surveyed were diverse and a good representational of the food and beverage manufacturing sector in Kenya.

##### **5.2.1 Freight Management and Firm Performance**

The first objective of the study was to determine the influence of freight management on performance of food and beverage manufacturing firms in Kenya. The findings of the study revealed that majority of the firms had no tracking and tracing system. Having tracking and tracing system improves performance and lack of tracking and tracing system decreased performance. The study findings also indicated that the nature of the fuel management system in majority of firms was proficient. Proficient fuel management system improves performance while inefficient fuel management system decreases performance.



The results further reveal that fleet scheduling and routing had a positive and significant relationship with turnaround time. The odds of observing a low turnaround time was higher for firms which have a proficient fleet scheduling and routing compared to firms do not. This implies that fleet scheduling and routing results to a low turnaround time. The relationship between freight management and performance was significant. The p-value indicated that the null hypothesis failed to be accepted hence freight management has significant influence on performance of food and beverage manufacturing firms in Kenya.

### **5.2.2 Logistics Information System Management and Firm Performance**

The second objective of the study was to establish the influence of logistics information system management on performance of food and beverage manufacturing firms in Kenya. The findings of the study revealed that majority of the firms had a database design and management, good inventory management system in their firms and also their supply and production management systems. Having a database design and management, good inventory management system in their firms and also their supply and production management systems improves performance.

The results also revealed that supply and production management systems had a positive and significant relationship with the odds of low turnaround time. The odds of observing low turnaround time were higher for those firms where supply and production management systems existed. This implies that supply and production management systems result to low turnaround time. The relationship between logistics information system management and performance was significant level. The p-value indicated that the null hypothesis failed to be accepted at level of significance hence logistics information system management has significant influence on performance of food and beverage manufacturing firms in Kenya.

### **5.2.3 Customer Relations Management and Firm Performance**

The third objective of the study was to determine the influence of customer relations management on performance of food and beverage manufacturing firms in Kenya. The findings of the study revealed that majority of the firms had posited customer relations

management through, customer feedback channels, customization and value addition of products, majority had a strong product returns and recalls management.

The results further revealed that product returns and recalls management and turnaround time had a positive and significant relationship. The odds of observing a low turnaround time was higher for those firms which had product returns and recalls management. This implies that product returns and recalls management results to low turnaround time. The relationship between customer relations management and performance was significant. The p-value indicated that the null hypothesis failed to be accepted hence customer relations management have a significant influence on performance of food and beverage manufacturing firms in Kenya.

#### **5.2.4 Product Packaging and Labelling and Firm Performance**

The fourth objective of the study was to assess the influence of product packaging and labelling on performance of food and beverage manufacturing firms in Kenya. The findings of the study revealed that majority of the manufacturing firms in Kenya have protective and attractive pack design, illustrative and descriptive labels, clear and consistent branding. The findings also indicated that having protective and attractive pack design, illustrative and descriptive labels, clear and consistent branding improve performance.

On the relationship between protective and attractive pack design and turnaround time, the study findings indicated that the relationship between illustrative and descriptive labels and turnaround time is positive. The results revealed that clear and consistent branding is positively and significantly related to turnaround time. The odds of observing a low turnaround time were higher for those firms whose leaders have clear and consistent branding as compared to those firms without. This implies that having clear and consistent branding leads to a low turnaround time. The relationship between product packaging and labelling and performance of food and beverage manufacturing firms in Kenya was significant implying that product packaging and labelling has significant influence on the performance of food and beverage manufacturing firms in Kenya.

### **5.2.5 Internal Policy Framework and Firm Performance**

The fifth objective of the study was to explore the moderating influence of internal policy framework on the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya. The findings of the study revealed that majority of the manufacturing firms have effective control levels, are have high levels of control and have transparency and risk assessments. The findings also revealed that having effective control levels, levels of control and have transparency and risk assessment improves performance. Furthermore, the findings of the study revealed that effective control levels are positively and significantly related to lead time.

The results for joint influence of fourth party logistics services indicated that fourth party logistics services are positively associated with performance of food and beverage manufacturing firms. The results further indicated that fourth party logistics services explain the changes in performance of food and beverage manufacturing firms in Kenya. The regression results also revealed that the relationship between fourth party logistics services and performance of food and beverage manufacturing firms is positive and significant implying that an improvement in fourth party logistics services leads to an improvement in performance of food and beverage manufacturing firms in Kenya. The findings indicated that internal policy framework has a moderating effect on the relationship between fourth party logistics services and performance.

### **5.3 Conclusion of the Study**

Based on the study findings, the study concluded that freight management influences performance. Freight management has significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of freight management that is tracking and tracing system, fuel management systems, fleet scheduling and routing influences performance positively.

The study concluded that logistics information system management has significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of logistics information system management that is database design and management,

inventory management system and supply and production management systems influence performance positively.

The study also concluded that customer relations management have a significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of customer relations management namely customer feedback channels, customization and value addition of products, product returns and recalls management influence performance positively.

Based on the study findings, the study concluded that product packaging and labelling have a significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of product packaging and labelling that is protective and attractive pack designs, illustrative, descriptive label, and clear consistent branding influence performance positively.

The study also concluded that Internal policy framework has a moderating influence on the relationship between fourth party logistics services and performance of food and beverage manufacturing firms in Kenya. The study also concluded that fourth party logistics services are positively associated with performance of food and beverage manufacturing firms.

#### **5.4 Recommendations of the Study**

The study recommendations are in line with the objectives, findings and conclusions of the study.

The study recommended that the management of manufacturing firms in Kenya should put in place freight management strategies as it leads to high performance. The firms should ensure they have a tracking and tracing system, fleet scheduling and routing and fuel management system in the company. The study also recommends that future scholars and researchers should aim to test the relationship between freight management and performance using different sub constructs apart from tracking and tracing system, fleet scheduling and routing and fuel management.

It is recommended that manufacturing firms in Kenya should have an improved logistics information system management system as it leads to high performance. The firms should have a database design and management, an inventory management system and a supply and production management systems.

The study also recommends that future scholars and researchers should aim to test the relationship between logistics information system management system and performance using different sub constructs apart from database design and management, an inventory management system and a supply and production management systems. This can bring rigour and offer platforms for comparison of findings.

The study also recommended that manufacturing firms should invest in customer feedback channels, customization and value addition of products, product returns and recalls management since it affects performance positively. Customer relations management being the ability to integrate, build and reconfigure internal and external competencies to address rapidly- changing customer needs, can also take the form of various ways apart from the ones discussed in the current study and hence the future scholars can seek to explore other measures of this factor.

Based on product packaging and labelling, the study recommended that manufacturing should put in place strategies to have product packaging and labelling as it has a positive effect on performance. The firms should encourage and put in place measures that promote protective and attractive designs, illustrative and descriptive label, clear and consistent branding as they influence performance positively.

### **5.5 Contribution of the Study to Theory and Existing Knowledge**

The study developed a conceptual framework for underpinning future research work on the influence of fourth party logistics services on performance of food and beverage manufacturing firms in Kenya. The study successfully tested hypothesis related to the original conceptual framework developed in chapter two.

Based on research findings, it was found that future conceptual frameworks should focus on all the four fourth party logistics services as well the moderating influence of Internal policy

framework. The study also contributed regarding prioritizations of fourth party logistics services. The study noted that both freight management and logistics information system management are the most vital fourth party logistics services in the manufacturing sector because they explain a higher change in performance.

The findings of the study can be linked to the logistics theory. The logistics theory presents the link between the parties for gaining the best possible results from logistics cooperation. Over time, mutual adjustments improve administrative and logistical systems, making them more efficient. By entering into close cooperation with fourth party logistics providers who possess complementary competencies, the individual firm is able to utilize freight resources and skills controlled by other players. Thus, managers of manufacturing companies in Kenya need to ensure efficient and effective logistical integration of all logistics activities to gain competitive advantage from the fourth party logistics providers by managing their lead-time.

The study findings can also be linked to the principle agency theory. This theory is based on the separation of ownership and control of economic activities between the agent and the principal. Various agent and principal problems may arise including conflicting objectives; differences in risk aversion, outcome uncertainty, and behavior based on self-interest, and bounded rationality. This may for example entail an agent having a different concept of database design and inventory systems that do not concur with the principles needs.

The contract between the principal and the agent governs the relationship between the two parties, and the aim of the theory is to design a contract that can mitigate potential agency problems. The “most efficient contract” includes the right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal.

Creating contracts with supply chain partners that balance rewards and penalties, misalignment can be mitigated. Balancing the need of the shipper and the capability of the fourth party logistics provider is a well-known managerial issue that explicitly implies the risk of agency problems. The logistics information system management by an agent for the principle should ensure there is no misalignment between the two and a balance of rewards should be reached.

## **5.6 Areas for Further Research**

Further studies can be done to establish the influence of fourth party logistics services on performance of firms in other sectors other than manufacturing firms in Kenya. A study can also be done to establish other factors that influence performance of food and beverage manufacturing firms other than fourth party logistics services factors. The results indicated that fourth party logistics services explain 74.8% of the changes in performance of food and beverage manufacturing firms in Kenya. This implies that the remaining 25.2% of the change in performance of food and beverage manufacturing firms is explained by other factors not investigated in the current study. A study can be conducted in future to establish the other factors.

## REFERENCES

- Abrahamsson, M. (2008). The role of Logistics in Corporate Strategy. *Business Process Management Journal*, 10(2), 54-68.
- Achuora, J. O., Guyo, W., Arasa, R. & Odhiambo, R., (2015). *Effect of Green Supply Chain Management Practices on the Performance of Manufacturing Firms in Kenya*, Ph.D (SCM) Dissertation. Jomo Kenyatta University of Agriculture and Technology: Kenya
- Aggarwal, R., & Singh, S. P. (2019). An integrated NPV-based supply chain configuration with third-party logistics services. *Journal of Revenue and Pricing Management*, 18(5), 367-375.
- Agyabeng-Mensah, Y., Afum, E., Acquah, I. S. K., Dacosta, E., Baah, C., & Ahenkorah, E. (2020). The role of green logistics management practices, supply chain traceability and logistics ecocentricity in sustainability performance. *The International Journal of Logistics Management*, 16(2); 318-327.
- Ahmed, R. R., & Zhang, X. (2021). Multi-stage network-based two-type cost minimization for the reverse logistics management of inert construction waste. *Waste Management*, 120, 805-819.
- Akinnuli, B. O., Farayibi, P. K., & Ojo, O. O. (2020). Manufacturing procurement cost allocation as dominant factor under limited available manufacturing equipment budget. *International Journal of Mathematics in Operational Research*, 17(2), 278-299.
- Alavi, M., & Carlson, P. (2012). A review of MIS research and disciplinary development: *Journal of Management Information Systems*, 8 (4), 45–62.
- Aldin, N., Brehmer, O., & Johansson, A. (2004). Business development with electronic commerce: refinement and repositioning. *Business Process Management Journal*, 10(1), 44-62.



- Alnahhal, M., Tabash, M. I., & Ahrens, D. (2021). Optimal selection of third-party logistics providers using integer programming: A case study of a furniture company storage and distribution. *Annals of Operations Research*, 302(1), 1-22.
- Aloo, B. A., & Ongwae, G. J. (2021). Relationship Between Fourth Party Logistics Services And Performance Of Manufacturing Firms In Kenya. *International Research Journal of Business and Strategic Management*, 2(1).
- Arkhipov, D. I., Wu, D., Wu, T., & Regan, A. C. (2020). A parallel genetic algorithm framework for transportation planning and logistics management. *IEEE Access*, 8, 106506-106515.
- Armistead, G. & Mapes, J. (2013). The impact of supply chain integration on operating performance: *International Journal of Logistics Information Management*, 6 (4), 9-14.
- Atalik, O., & Arslan, M. (2009). A study to determine the Effects of Customer Value on Customer Loyalty in Airline Companies Operating: Case of Turkish Air Travelers: *International Journal of Business and Management*, 4(6), 154-159.
- Atos, K. (2019). The elements of a successful logistics partnership: *International Journal of Physical Distribution & Logistics Management*, 26(3), 7-15.
- Audy, F., D'Amours, S. & Ronnqvist, M. (2012). An empirical study on coalition formation and cost/savings allocation: *International Journal of Production Economics*, 136 (1), 13-27
- Awino, Z. B. (2011). *Strategic Management: An Empirical Investigation of Selected Strategy Variables on Firms Performance: A Study of Supply Chain Management in Large Private Manufacturing Firms in Kenya*. 1(1), 9-18.
- Aydın, S., Yörükoğlu, M., & Kabak, M. (2022). Fourth party logistics firm assessment using a novel neutrosophic MCDM. *Journal of Intelligent & Fuzzy Systems*, 42(1), 529-539.

- Aziz, A., Memon, J. A., & Ali, S. (2020). Logistics capability, logistics outsourcing and firm performance in manufacturing companies in Pakistan. *The Journal of Asian Finance, Economics and Business*, 7(8), 435-444.
- Bagchi, P. & Skjoett-Larsen, T. (2012). Integration of Information Technology and Organizations in a Supply Chain: *International Journal of Logistics Management*, 4(1), 89-108.
- Baiman, S., & Rajan, M. (2012). Incentive issues in inter-firm relationships. *International Journal of Accounting Organizations* 27(2), 213-238.
- Ballot, B., & Fontane, F. (2010). Reducing transportation Co2 emissions through pooling of supply networks: perspectives from a case study in French retail chains: *International Journal of Production Planning & Control*, 21 (6), 640-650.
- Bask, A. H. (2011). Relationships among TPL providers and members of supply chains- a strategic perspective. *The Journal of Business and Industrial Marketing*, 16(6), 470-486.
- Bauer, M. (2018). Ethnographic study of business students' information-seeking behavior: Implications for improved library practices. *Journal of Business & Finance Librarianship*, 23(1), 1-10.
- Bauknight, D., & Miller, R. J., (2015). Re-engineering Global Supply Chain. *International Journal of Physical Distribution & Logistics Management* 30 (1), 13-34.
- Bedeman, M., & Gattorna, J. L. (2017). 4 Third-and Fourth-party logistics service providers. In *Gower handbook of supply chain management* (pp. 487-503). Routledge.
- Bell, E., Bryman, A., & Harley, B. (2018). *Business research methods*. Oxford university press.
- Berényi, L., & Deutsch, N. (2018). Effective teaching methods in business higher education: a students' perspective. *International journal of education and information technologies*, 12, 37-45.

- Bobbert, Y. (2017). On Exploring Research Methods for Business Information Security Alignment and Artefact Engineering. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 8(2), 28-41.
- Bolumole, Y. (2011). The Supply Chain Role of Third-Party Logistics Providers. *International Journal of Logistics Management*, 12(2), 87-102.
- Borgström, B., Hertz, S., & Jensen, L. M. (2021). Strategic development of third-party logistics providers (TPLs): “Going under the floor” or “raising the roof”? *Industrial Marketing Management*, 97, 183-192.
- Bourlakis, C. & Bourlakis, M. (2015). Information technology safeguards, logistics asset specificity and fourth-party logistics network creation in the food retail chain, *The Journal of Business & Industrial Marketing*, 20 (2), 88–99.
- Bowersox, J., Closs, J., & Cooper, M. (2010). *Supply Chain Logistics Management* (3rd Ed); Boston, Mass: McGraw-Hill.
- Bumstead, J. & Cannons, K. (2012). *From 4PL to managed supply-chain operations*, *Logistics & Transport Focus*, 4(4), 18–24
- Buyukozkan, G., Feyzioglu, O. & Ersoy, M. (2015). Evaluation of 4PL operating models: A decision making approach based on 2-additive integral, *International Journal of Production Economics*, 121 (5), 112-120.
- CCG. (2010). *National Development Fund Report Instructional Structures and Reforms*. Nairobi: Centre for Corporate Governance.
- Chang, W., Chiang, M., & Pai, Y. (2012). Cooperative Strategy in Supply Chain Networks. *International Journal of Industrial Marketing Management* 12 (1), 11-19.
- Chang, Y.H. (2011). *Logistical Management*. Hwa-Tai Bookstore Ltd., Taiwan.
- Chiappinelli, O. (2020). Decentralization and public procurement performance: New evidence from Italy. *Economic Inquiry*, 58(2), 856-880.

- Chih-Pei, H. U., & Chang, Y. Y. (2017). John W. Creswell, research design: Qualitative, quantitative, and mixed methods approach. *Journal of Social and Administrative Sciences*, 4(2), 205-207.
- Chopra, S., & Meindl, P. (2013). *Supply Chain Management: Strategy, Planning, & Operation*. (3th ed) NJ: Prentice-Hall. Inc
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Crujssen, F., Cools, M., & Dollaert, W. (2013). *Horizontal Cooperation in logistics: Opportunities and Pediments*. *Logistics and Transportation Review*, 4(2), 129-147
- Deloitte (2012). *Strategic Review of Logistics Outsourcing in Kenya*. Nairobi: International finance Corporation-World Bank Group Press. Retrieved February 2017
- Deloitte (2016). *Optimizing supply chain management*. Turning a Cost into a Value Proposition Accessed on 30<sup>th</sup> June 2017
- Dewnarain, S., Ramkissoon, H., & Mavondo, F. (2019). Social customer relationship management: An integrated conceptual framework. *Journal of Hospitality Marketing & Management*, 28(2), 172-188.
- Dirksen, M., & Magnin, G. (2017). Evaluation of synergy potentials in transportation networks managed by a fourth party logistics provider. *Transportation research procedia*, 25, 824-841.
- Dunn, S. D. (2010). *Statistics and Data analysis for the Behavioural Science*: Mc Graw Hill
- Eisenhardt, M., & Martin, J. A. (2010). Dynamic capabilities: what are they? *Strategic Management Journal*, 21(10/11), 1105-1121.
- Ekeskär, A., & Rudberg, M. (2022). Third-party logistics in construction: perspectives from suppliers and transport service providers. *Production Planning & Control*, 33(9-10), 831-846.

- Fabbe-Costes, N., Jahre, M. & Roussat, C. (2014). Supply chain integration: the role of logistics service providers, *International Journal of Productivity and Performance Management*, 58(1), 71- 91.
- Fawcett, E., Gregory, M., & Mathew, W, (2008). Benefits, barriers, and bridges to the effective supply chain management, Supply Chain Management. *International Journal of Operations Management*, 9 (2), 188-196.
- Fernando, Y., & Tew, M. M. (2016). Reverse logistics in manufacturing waste management: the missing link between environmental commitment and operational performance. *International Journal of Integrated Supply Management*, 10(3-4), 264-282.
- Fernando, Y., Sharon, S. S. T., Wahyuni-Td, I. S., & Tundys, B. (2017). The effects of reverse logistics on cost control abilities: an insight into manufacturing companies in Malaysia. *International Journal of Value Chain Management*, 8(4), 285-306.
- Finch, P. (2014). Supply Chain Risk Management, Supply Chain Management: *International Journal of Operations Research*, 9 (2), 183-196.
- Fisher, M. L. (2010). *The New Science of Retailing: How Analytics are Transforming Supply Chains and Improving Performance*, Harper, New York, USA.
- Foltean, F. S., Trif, S. M., & Tuleu, D. L. (2019). Customer relationship management capabilities and social media technology use: Consequences on firm performance. *Journal of Business Research*, 104, 563-575
- Fredriksson, A., Janné, M., & Rudberg, M. (2021). Characterizing third-party logistics setups in the context of construction. *International journal of physical distribution & logistics management*.
- Frost, J. & Sullivan, M. (2014). *Fourth-Party Logistics: Turning a Cost into a Value Proposition*, Supply Chain Management, 5(10), 1-2.
- Fu, H. (2017). Integration of Logistics Simulation Technology and Logistics Learning Factory in a Two-stage Teaching Method for Logistics Management Courses. *International Journal of Emerging Technologies in Learning*, 12(9).

- Gautam, N., Ojha, M. K., Swain, P., Aggarwal, A., & Jamwal, A. (2019). Informal investigation of fourth-party and third-party logistics service providers in terms of Indian context: an AHP approach. In *Advances in industrial and production engineering* (pp. 405-413). Springer, Singapore.
- Gencer, Y. G. (2019). Supply Chain Modernization: The Case of Turkish Companies in 3PL and 4PL Logistics Applications. In *The Circular Economy and Its Implications on Sustainability and the Green Supply Chain* (pp. 168-176). IGI Global.
- George, D., & Mallery, P. (2013). *SPSS for Windows step by step: A simple guide* Longman Publishers, Nairobi, Kenya Debt structure [Electronic Version]
- Ghosh, M. (2019). Determinants of green procurement implementation and its impact on firm performance. *Journal of Manufacturing Technology Management*, 13(9); 109-123.
- Ghoumrassi, A., & Tigu, G. (2018). The impact of the logistics management in customer satisfaction. In *Proceedings of the International Conference on Business Excellence* (Vol. 12, No. 1, pp. 407-415). Sciendo.
- Gil-Gomez, H., Guerola-Navarro, V., Oltra-Badenes, R., & Lozano-Quilis, J. A. (2020). Customer relationship management: digital transformation and sustainable business model innovation. *Economic research-Ekonomska istraživanja*, 33(1), 2733-2750.
- Grover, V. & Malhotra, M. (2013). Transaction cost framework in operations and supply chain management research: theory and measurement, *Journal of Operations Management*, 21(4), 457-473
- Gruchmann, T., Pratt, N., Eiten, J., & Melkonyan, A. (2020). 4PL digital business models in sea freight logistics: The case of Freighthub. *Logistics*, 4(2), 10.
- Haakansson, H., & Ford, D. (2012). How companies interact in business networks? *Journal of Business Research*, 55(1), 133-139
- Haffer, R. (2018). Supply Chain Performance Measurement System of Logistics Service Providers. A Conceptual Framework and Research Agenda. *Business Logistics in Modern Management*.

- Hameed, W. U., Nisar, Q. A., & Wu, H. C. (2021). Relationships between external knowledge, internal innovation, firms' open innovation performance, service innovation and business performance in the Pakistani hotel industry. *International Journal of Hospitality Management*, 92, 102745.
- Harland, C. M. (2009). Supply Chain Management: Relationships, Chains and Networks. *British Journal of management*, 21(14), 457-473
- Harrison, A., Skipworth, H., van Hoek, R. I., & Aitken, J. (2019). *Logistics management and strategy: competing through the supply chain*. Pearson UK.
- Hendricks, K. & Singhal, V. (2013). The Effect of Supply Chain glitches on Shareholder Wealth, *Journal of Operations Management* 45 (21), 501 – 522
- Herbert, K., Juliana, H., Mikkola, W., & Tage, S. (2013). Complementary theories to supply chain management. *International Journal of Supply Chain Management* 12(4), 284–296.
- Hertz, S., & Alfredsson, M. (2013). Strategic development of third-party logistics providers. *Industrial Marketing Management Journal*, 32(4), 139-149
- Hirakubo, N., & Kublin, M., (2011). The relative importance of supplier selection criteria: the case of electronic components procurement in Japan. *International Journal of Purchasing and Materials Management*, Spring, 35(4), 19-24.
- Hoekman, B., & Sanfilippo, M. (2018). Firm performance and participation in public procurement: Evidence from Sub-Saharan Africa. *Robert Schuman Centre for Advanced Studies Research Paper No. RSCAS, 16*.
- Hong, W., Xu, Z., Liu, W., Wu, L., & Pu, X. (2021). Queuing theory-based optimization research on the multi-objective transportation problem of fourth party logistics. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 235(8), 1327-1337.
- Horzela, A., Kolinski, A., Domanski, R., & Osmolski, W. (2018). Analysis of use of communication standards on the implementation of distribution processes in fourth party logistics (4PL). *Business Logistics in Modern Management*.

- Huang, M., Dong, L., Kuang, H., Jiang, Z. Z., Lee, L. H., & Wang, X. (2021). Supply chain network design considering customer psychological behavior-a 4PL perspective. *Computers & Industrial Engineering*, 159, 107484.
- Huang, M., Tu, J., Chao, X., & Jin, D. (2019). Quality risk in logistics outsourcing: A fourth party logistics perspective. *European Journal of Operational Research*, 276(3), 855-879.
- Hubner, A. & Elmhurst, M.A., (2013). “*E-business in Purchasing: From E-Procurement to Supply Chain Management*”, Published by Springer, 7 (5), 44-45
- Islam, D.Z. & Zunder, T. H. (2013). Performance evaluation of an online benchmarking tool for European freight transport chains, *Benchmarking: An International Journal* 20 (2), 233-250
- ISO (2010). ‘*Quality management and quality assurance vocabulary*, International Organization for Standardization, Geneva
- Ji, Y. (2021). Research on the Operation Mode of Financing Warehouse with the Participation of the Fourth Party Logistics. *Journal of Sociology and Ethnology*, 3(5), 114-118.
- Jiang, S., Chen, J., Huang, M., Zhang, Y., & Yin, M. (2021, May). Fourth party logistics network design considering quantity discount. In *2021 33rd Chinese Control and Decision Conference (CCDC)* (pp. 6049-6054). IEEE.
- Job, M. L., Njihia, M., Maalu, J., & Iraki, X. (2020). Reverse logistics and competitive advantage: the mediating effect of operational performance among manufacturing firms in Kenya.
- Johannessen, P. B. (2020). *4th Party Logistics Problem Optimizer* (Master's thesis, The University of Bergen).
- John, G & Johnson, P. (2012). *Research methods for Managers, 4th Edition*. Sage Publications: London.



- Joiner, T. (2012). Product Packaging management and performance: the role of organization support and co-worker support. *International journal of quality & reliability management*, 24(6), 617-627
- Jones, E., & Rashid, M. (2020). Fourth Party Logistics-Enlarging 3PL a Step Further. *International Supply Chain Technology Journal*, 6(04).
- Jovčić, S., Průša, P., Dobrodolac, M., & Švadlenka, L. (2019). A proposal for a decision-making tool in third-party logistics (3PL) provider selection based on multi-criteria analysis and the fuzzy approach. *Sustainability*, 11(15), 4236.
- Kairui, C. M. Wairimu, D., & Ouma, C. A. (2021). Influence of Customer relationship Management Performance of Service Firms in Kenya. *International Academic Journal of Human Resource and Business Administration*, 3(9), 246-255.
- Kamau, P., Makokha, A. K., & Pattasio, S. C. (2022). Product Packaging as an Outsourced Logistics Service and Performance of Manufacturing firms in Kenya. *Benchmarking: An International Journal*, 29(2), 551-572.
- Kasomo, D. (2011). *Research Methods in Humanities and Education*, Eldoret; Zapf Chancery
- Kaur, P., Stoltzfus, J., & Yellapu, V. (2018). Descriptive statistics. *International Journal of Academic Medicine*, 4(1), 60.
- Kaynak, H. (2010). The relationship between packaging management practices and their effects on firm performance. *Journal of Operations Management*, 21(4), 405–435.
- Kazemi, M., & Hooshyar, V. (2009). *Determining the Readiness Levels of University Chancellors to Use TQM- Case Study: A State University*; Higher Education Magazine, 8(7), 85-108
- Kenya Association of Manufacturers, (2016). *Kenya manufacturers & Exporters Directory*. (11th ed.). Nairobi: Kenya Association of Manufacturers
- Kenya Institute for Public Policy Research and Analysis. (2013). *Kenya Economic Report*. Nairobi: KIPPRA

- Kenyon, G. & Meixell, M. (2011). Success factors and cost management strategies for logistics outsourcing. *Journal of Management and Marketing Research*, 8(7), 1-17
- Kersten, W., Bemeleit, B., & Blecker, T., (2016). “*Managing Risks in Supply Chains: How to Build Reliable Collaboration in Logistics*”, Published by Eric Schmidt, 5(8), 67-105
- Ketokivi, M., & Schroeder, R. (2014). Manufacturing practices, strategic fit and performance: a routine-based view. *International Journal of Operations & Production Management*, 24(1/2), 171-191.
- Kinyua, S., Maluthe, C., & Kabatia, A. (2021). Internal Policy Framework, Firms’ adoption of New strategies and firm performance: The Kenyan evidence. *International Journal of Finance & Economics*, 26(4), 5704-5719.
- Kiprono, K. & Alexis, A. (2021). Third Party Logistics Adoption on Supply Chain Performance of Supermarkets in Eldoret Town, Kenya. *Target Journals*, 3 (2), 77-95. ISSN 1569- 9986.
- Kiruja, A. K., & Ngugi, P. K. (2019). Influence Of Third Party Logistics Management On Performance Of Level Four and Five Hospitals In Kenya. *International Journal of Social Sciences and Information Technology*, Vol V Issue IV,86-102.
- KNBS (2010). *Kenya Manufacturing Firms Survey*. Nairobi:
- Kombo, D. & Tromp, D. (2013). *Proposal and Thesis Writing, an introduction*. Nairobi: Pauline Publications Africa.
- Kothari, C. R. (2014). *Research Methodology Methods and Techniques* (2nd ed.). New Delhi: New Age Publishers
- Kothari, C.R. (2014). *Research Methodology; Methods & Techniques* (2<sup>nd</sup> ed.). New Delhi; New Age International Press Limited
- Kulkarni, N., Shaikh, A., Kurkure, N., & Bagul, U. (2019). A Secure Healthcare System using Blockchain Technology. *International Research Journal of Engineering and Technology (IRJET)*, 6(12), 2395-0056.

- Kwai-Sang, Tammala, V., Leung, J. & Tang, X. (2014). A study on supply chain management practices: The Hong Kong manufacturing perspective. *International Journal of Physical Distribution and Logistics Management*, 34 (6), 505-524
- Laarhoven, V., Berglund, M., & Peters, M. (2010). Third-party logistics in Europe five years later. *International Journal of Physical Distribution & Logistics Management* 30(5), 425- 442
- Lai, H., Ngai, T., & Cheng, E. (2012). Measures for evaluating supply chain performance in transport logistics: *International Journal of Transportation Research* 3(8), 439-56
- Laraib, M., Asim, M., & Manzoor, S. (2021). A Correlation between Process Management and Procurement Efficiency in Manufacturing Sector. *European Journal of Business and Management Research*, 6(2), 187-192.
- Lau, H. & Goh, Y. (2014). *An intelligent brokering system to support multi-agent web-based 4th-party logistics*, In Proceedings of the 14th IEEE international conference on tools with artificial intelligence, 30(5), 154–161
- Lau, K.H. & Zhang, J. (2016). Drivers and Obstacles of Outsourcing Practices in China. *International Journal of Physical Distribution & Logistics Management* 36 (10), 776-792
- Lee, M., Rho, H., & Lee, S. (2013). Impact of Malcolm Baldrige National Quality Award criteria on organizational quality performance. *International Journal of Production Research*, 41(9), 2003–2020.
- Lieb, R. C., & Lieb, K. J. (2010). The North American Third-Party Logistics Industry in 2010- The Provider CEO Perspective *Transportation Journal* 53 (2), 49-65
- Lieb, R., & Butner, K. (2013). The North American Third-Party Logistics Industry in 2016: The Provider CEO perspective. *Transportation Journal*, 46 (3), 40-52
- Liker, J. K., and Choi, T.Y., (2014). *Building deeper supplier relationships*. Harvard Business Review. 82 (12), 104-113

- Liu, C., & Lyons, A. (2011). *An analysis of third-party logistics performance and service provision*. *Transportation Research Part E: Logistics and Transportation Review* 34(47), 547-570.
- Liu, J., Shi, B., Xue, J., & Wang, Q. (2019). Improving the green public procurement performance of Chinese local governments: From the perspective of officials' knowledge. *Journal of Purchasing and Supply Management*, 25(3), 100501.
- Liu, L. & Yao, J. (2013). *Multi-objective optimization algorithm analysis on supply chain resources integration decision in 4PL*, In IEEE International Conference on Automation and Logistics, 7(8), 1852–1857
- Ljungberg, D., & Gebresenbet, G. (2014). Mapping out the potential for coordinated goods distribution in city centres: The case of Uppsala *International Journal of Transport Management* 8(3), 161-172.
- Loots, R. P. (2017). *Determining appropriate compensation for third-party logistics in Africa* (Doctoral dissertation, Stellenbosch: Stellenbosch University).
- Lu, F., Feng, W., Gao, M., Bi, H., & Wang, S. (2020). The Fourth-Party Logistics Routing Problem Using Ant Colony System-Improved Grey Wolf Optimization. *Journal of Advanced Transportation*, 2020.
- Maditati, D. R., Kummer, S., Munim, Z. H., & Schramm, H. J. (2022). Comparing outsourcing-outlook of manufacturing firms and logistics service providers in India and DACH countries. *Journal of Global Operations and Strategic Sourcing*.
- Majid, Z. A., Shamsudin, M. F., Rahman, N. A., Jaafar, H. S., Mohammad, M. F., & Khairuddin, M. M. (2019). Innovation in Logistics from 1PL toward 10PL: Counting the numbers. *Advances in Transportation and Logistics Research*, 2, 440-447.
- Makmor, M. F., Saludin, M. N., & Saad, M. (2019). Best Practices Among 3rd Party Logistics (3PL) Firms in Malaysia towards Logistics Performance. *International Journal of Academic Research in Business and Social Sciences*, 9(5).

- Mars Group Kenya (2011). *Manufacturing and industry sector report*. Retrieved from: Aid Effectiveness/Documents/Preparation of GoK sector plans/Draft Sector Plan-Manufacturing & Industry
- Masudin, I., Kamara, M. S., Zulfikarijah, F., & Dewi, S. K. (2018). Impact of inventory management and procurement practices on organization's performance. *Singaporean Journal of Business Economics and Management Studies (SJBEM)*, 6(3), 32-39.
- Mathenge, J., & Dihel, N. (2011). *The Role of Clearing and Forwarding Agents in Reforming the EAC Logistics Sector*. *Africa Trade Policy Notes*, Nairobi: Africa Trade Policy.
- McKinnon, A., Edwards, J., Piecyk, M., & Palmer, A. (2015). Traffic congestion, reliability and transport performance: a multi-sectorial assessment *International Journal of Logistics: Research and Applications* 12(5), 1-15.
- McNichols, T. & Brennan, L. (2016). *Evaluating Partner Suitability for Collaborative Supply Networks*, *Int. J. Networking and Virtual Organizations*, 3(2), 220-237
- Mehmann, J., & Teuteberg, F. (2016). The fourth-party logistics service provider approach to support sustainable development goals in transportation—a case study of the German agricultural bulk logistics sector. *Journal of Cleaner Production*, 126, 382-393.
- Mehmann, J., & Teuteberg, F. (2016). The fourth-party logistics service provider approach to support sustainable development goals in transportation—a case study of the German agricultural bulk logistics sector. *Journal of Cleaner Production*, 126, 382-393.
- Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance. *Information & Management*, 58(3), 103434.
- Min, X., Meng, F., Chu, D., & Wang, L. (2020, July). Modeling and solution algorithm for fourth-party logistics routing problem based on service composition. In *Journal of Physics: Conference Series* (Vol. 1584, No. 1, p. 012030). IOP Publishing.

- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of cardiac anaesthesia*, 22(1), 67.
- Mohd, M. N., Nadarajan, S., Ibrahim, S. H., & Mustapha, R. (2017). Procurement performance and supplier management measurement issues: a case of Malaysian private company. *International Journal of Supply Chain Management (IJSCM)*, 6(1), 246-253.
- Morash, E.A. & Clinton, S.R. (2011). The role of transportation capabilities in international supply chain management: *Transportation Journal*, 36(3), 5-17
- Muazu, U. (2019). Logistics management and the performance of manufacturing firms in selected states of northern Nigeria. *International Journal of Engineering and Management Research e-ISSN*, 2250-0758.
- Mugenda, O. & Mugenda, A. (2014). *Research methods quantitative and qualitative approaches*. Nairobi: Acts Press.
- Muhalia, E., Ngugi, P., & Moronge, M. (2021). Effect Of Transportation Management Systems On Supply Chain Performance Of Fmcg In Kenya. *American Journal Of Supply Chain Management*, 6(1), 1-12.
- Mukhopadhyay S.K., & Setaputra R., (2016). "The Role as the Reverse Logistic Integrator", *International Journal of Physical Distribution & Logistics Management*, 36(9), 716-729
- Murphy, P., & Poist, R. (2010). Third Party Logistics: Some user versus provider perspectives. *Journal of Business Logistics*, 21 (1), 121-34
- Musau, E. G., Namusonge, G., Makokha, E. N., & Ngeno, J. (2017). The effect of inventory and Freight management on organizational performance among textile manufacturing firms in Kenya. *International Journal of Academic Research in Business and Social Sciences*, 7(11), 1032-1046.
- Musau, E. G., Namusonge, G., Makokha, E. N., & Ngeno, J. (2017). The effect of transport management on organizational performance among textile manufacturing firms in

- Kenya. *International Journal of Academic Research in Business and Social Sciences*, 7(11), 1015-1031.
- Mutuku, A. K., & Moronge, M. (2020). Influence of Reverse Logistics on Performance of Food and Beverage Manufacturing Firms in Kenya. *International Journal of Supply Chain and Logistics*, 4(2), 129-151.
- Mwaura, A. W., Letting, N., Ithinji, G. K., & Bula, H. O. (2016). Green distribution practices and competitiveness of food manufacturing firms in Kenya. <http://41.89.227.156:8080/xmlui/handle/123456789/451>
- Narayanan, V., & Raman, A. (2014). *Aligning incentives in supply chains*. Harvard Business Review, 82(11), 94-102.
- Neuman, W.L. (2010). *Social Research Methods: Qualitative and Quantitative Approaches* (Fourth Edition ed.). Boston.
- Ngechu, M. (2009). Understanding the Research Process and Methods. *An Introduction to Research Methods*. Acts press, Nairobi
- Ngonela, W., Mwaniki, C., & Namusonge, G. (2014). Drivers of Logistics Outsourcing Practices in Tea Processing Firms in Bomet County. *IOSR Journal of Economics and Finance*, 4(1), 47-57
- Niemann, W., Meyer, A., Kotzé, T., & Odendaal, J. (2018, September). The role of third-party logistics providers as orchestrators in emerging markets. In *Proceedings of the 12th International Business Conference* (pp. 1743-1746).
- Novack, R.A. & Thomas, D.J. (2014). The challenges of implementing the perfect order concept, *Transportation Journal*, 21 (12), 121-34
- OECD (2012). *Actualizing Organizational Memory with Information Systems*”, Information Systems Research, Pearson Education Limited, Essex
- Oso, Y. & Onen, D. (2010). *A general Guide to Writing Research Proposal and Report*. Kisumu: Options Printers and Publishers.

- Owano, L. E., (2013). The emergence of 3PL logistics management in Kenya: *European Journal of Purchasing and Supply Management*, 5(1), 27-35.
- Öz, H. H., & Özyörük, B. (2021). Performance measurement in-fourth party reverse logistics. *Measuring Business Excellence*.
- Pan, S., Ballot, E., & Fontane, F. (2010). The reduction of greenhouse gas emissions from freight transport by pooling supply chains. *International Journal of Production Economics*, 10 (4), 95-115.
- Panayidis, P., & Meko, S. (2013). *Logistics Service Provider - Client Relationships. Transportation Research*, 5 (41), 179-200
- Panigrahi, S. K., Kar, F. W., Fen, T. A., Hoe, L. K., & Wong, M. (2018). A strategic initiative for successful reverse logistics management in retail industry. *Global Business Review*, 19(3\_suppl), S151-S175.
- Park, J., Shin, K., Chang, T.W., & Park, J. (2010). An integrative framework for supplier relationship management. *International Journal of Industrial Management & Data Systems*, 110 (4), 495-515.
- Parkhe, A. (2013). Strategic alliance structuring: a game theoretic and transaction cost examination of inter-firm cooperation. *Academy of Management Journal*, 36(4), 794-829.
- Patron, M. (2012). *Qualitative Research and Evaluation Method* (3ed.). London: Sage Publication Performance.
- Paul, M. R., Knemeyer, M. A., & Thomas, C. M. (2013). Logistics Outsourcing Relationships: Customer Perspectives. *Journal of Business Logistics*, 24 (1), 77-109.
- Payan, J. M. (2013). *A review and delineation of cooperation and coordination in marketing channels*. *European Business Review*, 19(3), 216-233.
- Peck, H. (2015). Drivers of Supply Chain Vulnerability: an integrated framework, *International Journal of Physical Distribution & Logistics Management*, 35(4), 210-232.



- Periukao, S., & Rashitau, T. (2019). The impact of the Internal Policy Framework and the continued Performance Enterprises in Ghana. *SAARJ Journal on Banking & Insurance Research*, 8(1), 62-67.
- Qian, X., Fang, S. C., Yin, M., Huang, M., & Li, X. (2021). Selecting green third-party logistics providers for a loss-averse fourth party logistics provider in a multiattribute reverse auction. *Information Sciences*, 548, 357-377.
- Radicic, D. (2019). Effectiveness of public procurement of innovation versus supply-side innovation measures in manufacturing and service sectors. *Science and Public Policy*, 46(5), 732-746.
- Rahim, S. A., Mohammad, B., & Rahman, N. A. A. (2016). Influencing Factors on Halal Fourth-Party Logistics (4PL) in Malaysia. In *Contemporary Issues and Development in the Global Halal Industry* (pp. 543-556). Springer, Singapore.
- Rao, K., & Young, R. R. (2015). Global Supply Chains: Factors influencing outsourcing of logistics functions. *International Journal of Physical Distribution & Logistics Management*, 24 (6), 11-19.
- Ristovska, N., Kozuharov, S., & Petkovski, V. (2017). The impact of logistics management practices on company's performance. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7(1), 245-252.
- Ross, D., & Forsythe, J. (2012). *Supply Chain Efficiency through Collaboration*. Logistics Quarterly, Winter.
- Sahay, S. & Mohan, R. (2016). 3PL practices: an Indian perspective. *International Journal of Physical Distribution & Logistics Management* 36 (9), 666-689.
- Saliba, M. (2013). Evaluation of the implementation of public sector supply chain management and challenges: A case study of the central district municipality, West province, South Africa; *African Journal of Business Management*, 2 (12), 230-242.
- Salome, R. W., Wainaina, G., Kinoti, M., & Odock, S. (2021). The influence of the moderating role of logistics information systems on the relationship between

- logistics management practices and customer satisfaction of shippers in Kenya. *DBA Africa Management Review*, 11(1), 65-83.
- Samson, M. (2012). *The driving factors of 3PL logistics management in Kenya Procurement Oversight Authority*, Quarterly PPOA Bulletin, 6 (4), 212-250 Nairobi
- Schönsleben, P. (2018). *Integral logistics management: operations and supply chain management within and across companies*. CRC Press.
- Schramm, H. J., Czaja, C. N., Dittrich, M., & Mentschel, M. (2019). Current advancements of and future developments for fourth party logistics in a digital future. *Logistics*, 3(1), 7.
- Sekaran, U., & Bougie, R. (2019). *Research methods for business: A skill building approach*. John Wiley & Sons.
- Shale, N. (2015). Role Of Fourth Party Logistics Service Providers On Supply Chain Performance In Distribution Firms In Kenya: A Case Of Acceler Global Limited . *Academic Journal of Social Sciences and Education*, 3(3). Retrieved from <https://ajsse.org/index.php/1/article/view/129>
- Sink, H. L., & Langley, C. J. (2012). A managerial framework for the acquisition of third-party logistics services. *Journal of Business Logistics* 18 (2), 56-87.
- SoonHu, S. (2010). A decision model for evaluating third-party logistics providers using fuzzy analytic hierarchy process. *African Journal of Business Management*, 4(3), 339-349.
- Swanepoel, E., Karrapan, C., Sishange, M., & Kilbourn, P. J. (2017). Benchmarking criteria for evaluating third-party logistics providers in South Africa. *Journal of Transport and Supply Chain Management*, 11(1), 1-10.
- Tan, C., Mavondo, F., & Worthington, S. (2011). Organizational capabilities and relationship quality performance implications for palm oil processors in Malaysia: *Asia Pacific Journal of Marketing and Logistics* 23 (2), 152-164.

- Taniguchi, E., Thompson, G., & Yamada, T. (2013). *Visions for city logistics*. Proceedings 3rd International Conference on City Logistics, Institute for City Logistics, 3 (2), 13-17.
- Tao, Y., Chew, E. P., Lee, L. H., & Shi, Y. (2017). A column generation approach for the route planning problem in fourth party logistics. *Journal of the Operational Research Society*, 68(2), 165-181.
- Tari, J., Molina, J., & Castejun, J. (2010). The relationship between management practices and their effects on performance outcomes. *European Journal of Operational Research*, 18(3), 483–501.
- Tatarczak, A. (2018). Profit allocation problems for fourth party logistics supply chain coalition based on game theory approach. *Journal of Economics & Management*, 33, 120-135.
- Thompson, G. & Taniguchi, E. (2011). *City logistics and freight transport*. Handbook of Logistics and Supply Chain Management, Elsevier Science Ltd., UK, 12(6), 393-405
- Thrugachantar, P., & Zailani, S. (2011). The influence of purchasing strategies on an empirical study in Malaysia, *Journal of Manufacturing Technology Management* 22(5), 641-663
- Tien, N. H., Anh, D. B. H., & Thuc, T. D. (2019). Global supply chain and logistics management. *Dehli: Academic Publications*.
- Tilokavichai, V., & Sophatsathit, P. (2011). An Organization-Wide Analysis of ERP and Information Systems Interrelationship for Logistics Support\*, *Journal of System and Management Sciences* 7(1), 59-68.
- Tilokavichai, V., Sophatsathit, P., & Chandrachai, A. (2012). Analysis of Linkages between Logistics Information Systems and Logistics Performance Management under Uncertainty: *European Journal of Business and Management*, 4(9), 22-39
- Tracey, M. & Tan, L. (2010). Empirical analysis of supplier selection and involvement, customer satisfaction and firm performance Supply chain management: *An International Journal* 6 (4), 174-188.

- Tseng, Y., Yue, L., & Taylor, A., (2005). *The Role of Transportation in Logistics Chain*; Proceedings of the Eastern Asia Society for Transportation Studies 4(5), 1657–1672
- Tukamuhabwa, B. R., Mutebi, H., & Kwagala, R. (2021). Supply chain agility in third-party logistics providers: its relationship with institutional and cultural geographical traits in a developing country. *Journal of Economic and Administrative Sciences*.
- Tukamuhabwa, B.R. Eyaa, S. & Derek, F., (2011). Mediating Variables in the Relationship between Market Orientation and Supply Chain Performance: A Theoretical Approach; *International Journal of Business and Social Science* 2 (22), 104-118
- Tuttle, T. & Heap, J. (2008). Green Productivity: Moving the Agenda: *International Journal of Productivity and Performance Management* 57(1), 93-106.
- USAID (2012). *Selecting and implementing vendor managed inventory systems for public sector supply chain*: Deliver Project, USAID
- Vaidyanathan, G. (2005). *A Framework for Evaluating Third-Party Logistics*: Communications of the ACM, 48 (1), 89-94.
- Walton, C. (2010). *4PL Versus 3PL*. Motor Transport, 5 (7), 10-11
- Wambui, M. (2010), *Analysis of Outsourcing at Kenya Armed Forces*, Unpublished MBA Project: University of Nairobi
- Wang, H., Huang, M., Feng, X., & Zhou, Y. (2022). Contract design for the fourth party logistics considering tardiness risk. *International Journal of Industrial Engineering Computations*, 13(1), 13-30.
- Wang, H., Huang, M., Ip, W. H., & Wang, X. (2021). Network design for maximizing service satisfaction of suppliers and customers under limited budget for industry innovator fourth-party logistics. *Computers & Industrial Engineering*, 158, 107404.
- Wang, L., Guo, Y., & Zeng, X. (2021). Green Procurement and Manufacturing, Innovation Orientation and Operational Performance: A Firm Level Panel Data Analysis. In *2021 IEEE 6th International Conference on Computer and Communication Systems (ICCCS)* (pp. 59-64). IEEE.

- Wang, Z., & Kim, H. G. (2017). Can social media marketing improve customer relationship capabilities and firm performance? Dynamic capability perspective. *Journal of Interactive Marketing*, 39, 15-26.
- Wardaya, M.S., Hadiwidjoyo, D., & Surachman, E., (2013). Improving Competitiveness of the National Industry of Logistics Service Providers through Collaboration from the Perspective of Consumer Goods Manufacturing Companies in East Jav: *International Journal of Business and Management Invention* 2 (5), 27-38
- Williams, F.P. (2012). Appropriateness of the stakeholder approach to measuring manufacturing performance: *Journal of Managerial Issues* 12 (2), 227- 46.
- Wisner, J.D. (2010). A structural equation model of supply chain management strategies and firm performance. *Journal of Managerial Issues* 10 (2), 27- 46
- Witjaksono, A. (2012). *The difference of management practices and organization performance*, 2nd conference on management, economics and social science, 5(9), 139-143
- Wong, Y., & Karia, N. (2010). Explaining the competitive advantage of logistics providers: A resource-based view approach. *International Journal of Production Economics* 12(8), 51-67.
- World Bank (2008). *Kenya: Investment Climate Assessment, draft*. Washington D.C: The World Bank.
- World Bank (2010). *World Economic Forum. Global Competitiveness Report*. World Bank's Logistics Performance Index (LPI) Measuring Logistics Performance
- World Bank (2013). *Kenya economic update: Accelerating growth and poverty reduction in the Kenya*.
- World Bank (2013). *Reducing Supply Chain Barriers Could Increase Global GDP Up To 6 Times More Than Removing All Import Tariffs Report*", Switzerland
- Xian, H., & Meng-Lewis, Y. (2018). *Business research methods for Chinese students: a practical guide to your research project*. SAGE.

- Xiande, Z. (2008). Understanding drivers of performance in the 3PL industry in Hong Kong. *International Journal of Operations & Production Management*, 28(8), 772-800
- Xu, X., Pan, S. & Ballot, E. (2013). *A sharing mechanism for super additive and non-super additive logistics cooperation*, International Conference on Industrial Engineering and Systems Management
- Yang, C., Marlow, B., & Lu, S. (2009). Assessing resources, logistics service capabilities, innovation capabilities and the performance of container shipping service in Taiwan. *International Journal of Production Economics* 122 (10), 4-20.
- Yeung, A. & Lo, V. (2009). *Impacts of supply management practices on performance: A Study in Hong Kong*, Proceedings of the 4th Asian Control Conference, 8(5), 25-27
- Yin, M., Huang, M., Qian, X., Wang, D., Wang, X., & Lee, L. H. (2021). Fourth-party logistics network design with service time constraint under stochastic demand. *Journal of Intelligent Manufacturing*, 1-25.
- Zai, I. (2021). Factors Affecting Procurement Performance In The Industries At Batam. *Journal Of Business Studies And Management Review*, 4(2), 143-147.
- Zailani, S. & Rajagopal, P. (2005). Supply chain integration and performance: US versus East Asian companies, *Supply Chain Management: An International Journal*, 10(5), 379-393
- Zanchett, R. (2010). Satisfaction and loyalty attributes in logistics services: *Journal of e-procurement* 17(4), 801-816
- Zeng, S.X., & Wan, T.W. (2008). *Competitive priorities of manufacturing firms for internalization: an empirical research*: *Measuring Business Excellence* 12(3), 44-55.
- Zhang, L., Maina, J., & Viry-Chatillon, F. (2019). Emerging issues of green logistics in manufacturing firms of china: A literature review. *European Journal of Logistics, Purchasing and Supply Chain Management*, 7 (4): 35, 49.
- Zhang, N., Goh, M., & Meng, F. (2011). Conceptual modeling for supply chain inventory visibility. *International Journal of Production Economics* 133(2), 578–585

- Zhang, Q., & Lim, S. (2005). Logistics flexibility and its impact on customer satisfaction. *The International Journal of Logistics Management* 16(1), 71-95
- Zhang, Y., Li, X., Wang, L., Zhao, X., & Gao, J. (2022). Financing capital-constrained third-party logistic firms: fourth party logistic driven financing mode vs. private lending driven financing mode. *International Journal of Production Research*, 60(9), 2963-2982.
- Zhao, M., Droge, C., & Stank, T.P. (2010). The effects of logistics capabilities on firm performance: customer-focused versus information-focused capabilities, *Journal of Business Logistics*, 22 (2), 91-107.

## APPENDICES

### **Appendix I: Introduction Letter**

Naomy Jepchumba (PhD Student)

Jomo Kenyatta University of Agriculture and Technology (JKUAT)

P.O. BOX 62000-00200 City Square Nairobi

Date: .....

The Supply Chain Manager,

Dear Sir/Madam,

### **RE: ACADEMIC RESEARCH THESIS**

I am a PhD student at Jomo Kenyatta University of Agriculture and Technology pursuing a PhD programme in Supply Chain Management. One of the requirements for the award of the degree is to write a dissertation in my area of study. The title of my research is “Fourth Party Logistics Service and Performance of Food and Beverage Manufacturing Firms in Kenya”. A questionnaire has been designed and attached. It will be used to gather relevant information to address the research objectives of the study. It is the assurance of the researcher that the information given will be treated with utmost confidentiality and will be solely used for the purpose of this study. Your positive response will be highly appreciated. Thank you in anticipation.

Yours Sincerely,

Naomy Jepchumba

PhD Student, JKUAT.

Email: kemydenaomy@gmail.com



## Appendix II: Questionnaire

*This questionnaire has been set in relation to the objectives of the study. All the questions relate to influence of fourth party logistics services on performance of food and beverage manufacturing firms in Kenya. Kindly read the questions carefully and answer them as honestly as possible by ticking (✓), rating, specifying or writing the correct answers precisely on the spaces provided.*

### SECTION 1: RESPONDENT'S INFORMATION

6. Please indicate the Category of products that your firm deals in (Please tick in the appropriate box)

Alcoholic Beverages     Non-Alcoholic Beverages     Bakers and Millers   
]

Dairy products     Packed Foodstuffs     Other (Specify)  
.....

7. For how long has your firm been operating in the Kenyan Market? (Please tick in the appropriate box)

Below 5 Years     5 – 10 Years     11 – 15 Years

16 – 20 Years     Over 20 Years

8. How many products does your company deal in currently? (Please tick in the appropriate box)

Only 1     2 – 4     5 – 7     8 – 10     Above 10

**SECTION 2: FREIGHT MANAGEMENT**

9. Please indicate the extent to which you agree or disagree with the following statements  
 (Please Tick 1 for “Strongly Disagree”, 2 for “Disagree”, 3 for neutral”, 4 for “Agree”  
 and 5 for “Strongly Agree”).

	Statement	1	2	3	4	5
a)	The company has embraced a tracking system for its trucks and other mobile equipment					
b)	The trace systems are monitored to ensure they are effective and up-to-date					
c)	There have been minimal cases of freight loss after the track systems are put in place					
d)	The company has embraced systems for managing fuel in all its vehicles					
e)	There are proper mechanisms of ensuring the fuel management systems is effectively utilized					
f)	Embracing systems for managing fuel has enabled the company to save on fuel wastage					
g)	The organization upholds effective scheduling of delivery routes					
h)	The fleet in our company are scheduled in a manner that saves on time and cost					

i)	The framework of scheduling fleet and routes has enabled our firm to enhance effectiveness					
----	--	--	--	--	--	--

10. In your opinion, how effective would you rate the freight management system as implemented in your organization?

Very Effective [ ]

Effective [ ]

Somehow Effective [ ]

Ineffective [ ]

Please explain your answer in '10' above .....

.....  
 .....  
 .....

**SECTION 3: Logistics Information System Management**

11. Please indicate the extent to which you agree or disagree with the following statements.

(Please Tick 1 for “Strongly Disagree”, 2 for “Disagree”, 3 for neutral”, 4 for “Agree” and 5 for “Strongly Agree”).

		1	2	3	4	5
a)	Our company has an active database for keeping all logistics information					

b)	The available database is designed in a secure and easily accessible manner					
c)	Through a well-managed and designed database, we are able to monitor the logistics of the company					
d)	Our company has an effective system for monitoring the inventory					
e)	The inventory levels and flow are appropriately controlled using the adopted system					
f)	The company through the management is committed towards embracing the best systems of managing inventory					
g)	The company has an active systems for engaged and sharing information with suppliers					
h)	The product process in our company is monitored by effective systems					
i)	The management of the organization has been committed on embracing information technology in key supplier chain frameworks					

12. How would you rate the logistics information system management implemented in your organization?

- a) Very Effective
- b) Effective
- c) Somehow Effective
- d) Ineffective

Please explain your answer '12' above .....

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**Section 4: Customer Relations Management**

13. Please indicate the extent to which you agree or disagree with the following statements.  
 (Please Tick 1 for “Strongly Disagree”, 2 for “Disagree”, 3 for neutral”, 4 for “Agree” and 5 for “Strongly Agree”).

		1	2	3	4	5
a)	The company has an active platform for sharing information with the customers					
b)	The customers are given feedback to their queries timely					
c)	There are approaches where employees can share their views to any individual within the company					

d)	The products are designed and produced as per the customer specifications					
e)	The company upholds value adding the products and services to exceed the customer expectations					
f)	Product returns and recalls management The customers are involved in every stage of delivering their orders					
g)	The customers are always free to return any products that do not meet their specifications					
h)	The company has a policy for recalling any products that are delivered to the customers without meeting the expectations					
i)	The management of our company has been committed towards enhancing the relations of the customers and quality services/products					

14. How would you rate the customer relations management system implemented in your organization?

- a) Very Effective
- b) Effective
- c) Somehow Effective
- d) Ineffective

Please explain your answer '14' above .....

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**SECTION 5: Product Packaging**

15. Please indicate the extent to which you agree or disagree with the following statements.  
 (Please Tick 1 for “Strongly Disagree”, 2 for “Disagree”, 3 for neutral”, 4 for “Agree” and 5 for “Strongly Agree”).

		1	2	3	4	5
a)	The packaging materials used in our products are not harmful to individuals or environment					
b)	The company adopts product designs that ensure the product is protected from any external damage					
c)	The designs used in packaging enhance in order to be appealing to the customers					
d)	Our company’s products are labeled appropriately to capture all the required information					
e)	The information given when describing our products is truthful and adequate					

f)	The labels used are coherent with our customers language and level of understanding					
g)	Our products are branded in clear design that customers are able to distinguish					
h)	The branding of the company's products is consistent across all the categories of the products					
i)	Most of the customers in our company are familiar with our products' brand					

16. How would you rate the product Packaging system implemented in your organization?

- a) Very Effective
- b) Effective
- c) Somehow Effective
- d) Ineffective

Please explain your answer in 16 above .....

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**SECTION 6: Internal policy framework**

17. Please indicate the extent to which you agree or disagree with the following statements.

(Please Tick 1 for “Strongly Disagree”, 2 for “Disagree”, 3 for neutral”, 4 for “Agree” and 5 for “Strongly Agree”).

		1	2	3	4	5
a)	Our company is always alert on changes in policies and regulations					
b)	The company through the management always ensures that it is visible in the policing process					
c)	The company has emphasized on carrying out logistics with partners who have adhered to the existing policies					
d)	The company always ensures that there is a control framework for the logistics operations					
e)	The level of our company’s control in fourth party logistics has been high					
f)	The management has set out a standard for adhering to the existing logistics policies					
g)	There is a significant level of transparency between our company and its logistics partners					

h)	The company frequently carries out risk's assessment on the fourth party logistics partners					
i)	Through adherence to the existing policies in logistics management our company has enhanced its effectiveness					

18. How would you rate the Internal policy framework implemented in your organization?

- a) Very Effective
- b) Effective
- c) Somehow Effective
- d) Ineffective

Please explain your answer in 18 above .....

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**SECTION 7: Performance of Food and Beverage Manufacturing Firms**

19. Please indicate the following as they apply in your organization

	2017	2018	2019	2020	2021	2022
Customer Satisfaction Index (%)						
Sales Volume in Kshs						
Average Lead time in weeks						

Cost of Production materials in Kshs.						
Value of produced goods in Kshs.						
Operational costs in Kshs.						
Average waiting time in weeks						

Please indicate the level of agreement with the following statements regarding the performance of your organization.

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
The customer satisfaction index in our company has continually increased over the past five years					
The company has ensured that the customers' waiting time is reduced over the time					
Sales volumes in our company have increased for the past five years					
Our company's level of production has been optimized to meet market demand for the past five years					
The company has significantly reduced its production costs for the past five years					
The lead time in our company has been significantly reduced for the past five years					

**THANK YOU FOR YOUR TIME**

### Appendix III: List of Food and Beverage Processing Companies in Kenya

Source: Kenya Association of Manufacturers - KAM (2021)

1. Africa Spirits Ltd
2. Agricultural & Veterinary Supplies Ltd (AGRI-VET)
3. Agriner Agricultural Development
4. Agri Pro-Pak Ltd
5. Agro Chemical and Food Company Ltd
6. Al-Mahra Industries Ltd
7. Alpha Fine Foods Ltd
8. Alphine Coolers Ltd
9. Aquamist Ltd
10. Arkay Industries Ltd
11. Bakers Corner Ltd
12. Bakex Miller Ltd
13. Belat Enterprises
14. Belfast Millers Ltd
15. Beverage Services (K) Ltd
16. Bidco Africa Ltd
17. Bio Food Products Ltd
18. Bounty Ltd
19. The Breakfast Cereal Company (K) Ltd
20. Kenya Ltd Broadway Bakery Ltd
21. Brookside Dairy Ltd
22. Bunda Cakes & Fees Ltd
23. Bunge East Africa Ltd
24. Butali Sugar Mills Ltd
25. Buzeki Dairy Ltd
26. C. Dormans Ltd
27. Cardbury Kenya Ltd
28. Caffè Del Duca Ltd
29. Candy Kenya Ltd
30. Capwell Industries Ltd
31. Centrofood Industries Ltd
32. Chai Trading Company Ltd
33. Chemelil Sugar Company Ltd
34. Chirag Kenya Ltd
35. Coast Silos (K) Ltd
36. Coastal Bottlers Ltd
37. Coca-Cola East & Central Africa Ltd
38. Coffee Agriworks Ltd
39. Cofftea Agencies
40. Danone Baby Nutrition Africa & Overseas
41. Deepa Industries Ltd
42. Tropical Brand (Africa) Ltd
43. Del Monte Kenya Ltd
44. Diamond Industries Ltd
45. Doinyo Lessos Creameries Ltd
46. DPL Festive Ltd

47. Dutch Water Ltd
48. East Africa Breweries Ltd
49. East African Malt Ltd
50. East Africa Sea Food Ltd
51. Edible Oil Products
52. Eldoret Grains Ltd
53. Elekea Ltd
54. Ennvalley Bakery Ltd
55. Equator Bottlers Ltd
56. Erdemann Co. (K) Ltd
57. Europack Industries Ltd
58. Excel Chemicals Ltd
59. Farmers Choice Ltd
60. Fresh Produce Exporters Association of Kenya
61. Frigoken Ltd
62. Giloil Company Ltd
63. Githunguri Dairy Farmers Co-Operative Society
64. Glaciers Products
65. Global Fresh Ltd
66. Global Tea & Commodities (K) Ltd
67. Gold Crown Beverages (K) Ltd
68. Gona Best Ltd
69. Grain Industries Ltd
70. Green Forest Foods Ltd
71. Happy Cow Ltd
72. Heritage Foods Kenya Ltd
73. Highlands Canners Ltd
74. Highlands Mineral Water Company Ltd
75. Insta Products (EPZ) Ltd
76. Jambo Biscuits (K) Ltd
77. James Finlay Kenya Ltd
78. Jetlak Foods Ltd
79. Jjasm Mini-Distillery
80. Juja Coffee Exporters
81. Jungle Group Holdings
82. Kabianga Dairy Ltd
83. Kerio Valley Development Authority
84. Eastern Produce (K) Kakuzi
85. Kambu Distillers Ltd
86. Kamili Packers Ltd
87. Kappa Oil Refineries Ltd
88. Karirana Estate Ltd
89. Kenafriic Bakery
90. Kenafriic Industries Ltd
91. Kenblest Ltd
92. Kenchic Ltd
93. Kenlab Supplies Ltd
94. Kenstaste Products
95. Kenya Meat Commission
96. Kenya Nut Company Ltd
97. Kenya Sweets Ltd

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|--------------------------------------|--|
| 98. Kenya Tea Development Agency     | 124. Mini Bakeries                         |
| 99. Kenya Tea Growers Association    | 125. Miritini Kenya Ltd                    |
| 100. Kenya Tea Packers Ltd.(KETEPA)  | 126. Mjengo Ltd                            |
| 101. Kenya Wine Agencies Ltd         | 127. Mombasa Maize Millers                 |
| 102. Keroche Industries Ltd          | 128. Morani Ltd                            |
| 103. Kevian Kenya Ltd                | 129. Mount Kenya Bottlers Ltd              |
| 104. Kibos Sugar & Allied Industries | 130. Mumias Sugar Company Ltd              |
| 105. Kinagop Dairy Ltd               | 131. New Kenya Co-Operative Creameries Ltd |
| 106. Kisii Bottlers Ltd              | 132. Nesfoods Industries Ltd               |
| 107. Koba Waters Ltd                 | 133. Nestle Foods Kenya Ltd                |
| 108. Krish Commodities Ltd           | 134. Nicey Nicey Maize Millers             |
| 109. Kuguru Food Complex Ltd         | 135. Nicola Farms Ltd                      |
| 110. Kwaliti Candies & Sweets Ltd    | 136. Njoro Canning Factory (Kenya) Ltd     |
| 111. London Distillers (K) Ltd       | 137. Norda Industries                      |
| 112. Mafuko Industries Ltd           | 138. Nutro Manufacturing Epz Ltd           |
| 113. Mama Millers Ltd                | 139. Nzoia Sugar Company Ltd               |
| 114. Manji Food Industries Ltd       | 140. Palmhouse Diaries Ltd                 |
| 115. Mayfeeds Kenya Ltd              | 141. Patco Industries Ltd                  |
| 116. MDI Ltd                         | 142. Pernod Ricard Kenya Ltd               |
| 117. Mzuri Sweets Ltd                | 143. Pearl Industries Ltd                  |
| 118. Nairobi Bottlers Ltd            | 144. Pembe Flour Mills Ltd                 |
| 119. Nairobi Flour Mills Ltd         | 145. Premier Flour Mills Ltd               |
| 120. Nas Airport Services Ltd        | 146. Premier Food Industries Ltd           |
| 121. Melvin Marsh International      | 147. Pride Industries Ltd                  |
| 122. Menegai Oil Refineries Ltd      | 148. Pristine International Ltd            |
| 123. Milly Fruit Processors          | 149. Proctor & Allan (E.A) Ltd             |

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|---|---------------------------------------|
| 150. Promasidor Kenya Ltd                       | 176. United Millers Ltd               |
| 151. Pwani Oil Products Ltd                     | 177. Usafi Services Ltd               |
| 152. Rafiki Millers Ltd                         | 178. Valuepak Food                    |
| 153. Raka Milk Processors Ltd                   | 179. Valley Confectionery Ltd         |
| 154. Razco Ltd                                  | 180. Vinepack Ltd                     |
| 155. Re-Suns Spices Ltd                         | 181. W.E. Tilley (Muthaiga) Ltd       |
| 156. Rift Valley Bottlers Ltd                   | 182. Wanaishi Marine Products (K) Ltd |
| 157. Salim Wazarani Kenya Company Ltd           | 183. Wanji Food Industries Ltd        |
| 158. Sameer Agriculture & Livestock (Kenya) Ltd | 184. West Kenya Sugar Company Ltd     |
| 159. SBC Kenya Ltd                              | 185. Winnie's Pure Health             |
| 160. Sigma Supplies Ltd                         | 186. Wrigley Company (E.A.) Ltd       |
| 161. Selecta Kenya GmbH & Sons KG               | 187. Xpressions Flora Ltd             |
| 162. Spectre International Ltd                  | 188. Waters Tigs Ltd                  |
| 163. South Nyanza Sugar Company Ltd             | 189. Krish Commodities Ltd            |
| 164. Spice World Ltd                            | 190. Kuguru Food Complex Ltd          |
| 165. Sunny Processors Ltd                       | 191. Kwality Candies & Sweets Ltd     |
| 166. Supa Sweets Ltd                            | 192. Weilliams Distillers Ltd         |
| 167. Sweet Rus Ltd                              | 193. Yernich Industries Ltd           |
| 168. Trufoods Ltd                               | 194. Mama Millers Ltd                 |
| 169. Trust Feeds Ltd                            | 195. Qurners Food Industries Ltd      |
| 170. Trust Flour Mills Ltd                      | 196. Yuri feeds Kenya Ltd             |
| 171. T.S.S Grain Millers Ltd                    | 197. Zeriukus Foods Ltd               |
| 172. Umoja Flour Millers Ltd                    |                                       |
| 173. Umoja Maintenance Centre (K) Ltd           |                                       |
| 174. Unga Group Ltd                             |                                       |
| 175. United Distillers And Vintners             |                                       |