

**SUPPLY CHAIN GOVERNANCE AND PERFORMANCE
OF AGRO PROCESSING FIRMS IN KENYA**

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DOCTOR OF PHILOSOPHY

(Supply Chain Management)

JOMO KENYATTA UNIVERSITY

OF

AGRICULTURE AND TECHNOLOGY

2024

**Supply Chain Governance and Performance of Agro Processing
Firms in Kenya**

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**A Thesis Submitted in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in Supply Chain Management of
the Jomo Kenyatta University of Agriculture and Technology**

2024

DECLARATION

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

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This thesis has been submitted for examination with our approval as the University Supervisors.

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DEDICATION

This thesis is dedicated to my late father, Phaniel Ominde Owuor and my mother, Jenipha Ominde who instilled the foundation of my education since childhood. To my wife Elsa Aketch Ominde and my children: Nanu Kagezi Ominde, Nintu Niwasu Ominde, Wakaiwa Mwakanyu Ominde, Dr. Nakunta Muwasu Ominde and Ominde Muhambi Owuor for their moral support and steadfast encouragement.

ACKNOWLEDGEMENT

I would like to thank the Almighty God for the gifts of life, courage, strength and guidance that has made it possible for me to work on this thesis. I sincerely thank each member of my family who continued to pray for me and for their patience, love, support and kindness during the period. I would also like to express my sincere gratitude to my supervisors, Dr. Anthony Osoro and Dr. Damaris G. Monari for their tireless support and supervision they accorded me since I started writing this thesis. I am indebted to Dr. Alice Simiyu for the technical review and guidance she gave towards improvement of this thesis. I also acknowledge the input and the never-ending encouragement of comrade Dr. Conrad Ocheo and comrade Dr. Erastus Nyile. To all my lecturers and fellow students, I appreciate the guidance and time we spent together toiling in class to ensure success. I am also thankful to members of staff of JKUAT, Nairobi CBD Campus for their warm and friendly nature whenever I needed their assistance. For those who I have not mentioned please accept my gratitude, you might not be mentioned but your names are forever engraved in my heart for your input towards this research study. Thank you and God bless you all.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
B2B	Busines to Business
CRM	Customer Relationship Management
EDI	Electronic Data Interchange
EFT	Electronic Fund Transfer
GDP	Gross Domestic Product
GoK	Government of Kenya
IMS	Information Management System
IS	Information Systems
IPRs	Intellectual Property Rights
KAM	Kenya Association of Manufacturers
KNBS	Kenya National Bureau of Statistics
NACOSTI	National Commission for Science, Technology and Innovation
OECD	Organisation for Economic Co-operation and Development
RFID	Radio Frequency Identification
ROA	Return on Assets
SADC	Southern African Development Community
SCF	Supply Chain Finance

SCG	Supply Chain Governance
SCP	Supply Chain Performance
SCR	Supply Chain Resilience
SPSS	Statistical Packages for the Social Sciences
TOC	Theory of Constraints
ToP	Theory of Performance
VIF	Variance Inflation Factor

DEFINITION OF OPERATIONAL TERMS

Agro Processing

The process or action taken by manufacturers of converting primary agricultural products into consumable commodities suitable for consumption. Agro-processing involves the manufacture of raw materials and intermediate goods derived from the agricultural sector into finished products. The raw materials can be obtained from different subsectors, such as agriculture, forestry, and fisheries (Maina, Gichira & Wanjau, 2017).

Contractual Supply Chain Governance

The process of systematically and efficiently managing contract creation, execution and analysis for the purpose of maximizing financial and operational performance and minimizing risk. It involves governing a transaction through formal contracts and the management of contracts made with customers, vendors, partners, or employees through effective negotiation and support (Aben, van der Valk, Roehrich, & Selviaridis, 2021).

Information

Is data that is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and

decrease in uncertainty. Information is valuable because it can affect behavior, a decision, or an outcome (Phillips, Roehrich & Kapletia, 2021).

Information Flow

The flow of data in different directions with variable contents between various data base or departments within a company and systems that must be in place to manage, control and coordinate all the information that is available then decide which information should not be released and which can or should be released (Lu, Jiang & Wang, 2024).

Relational Supply Chain Governance

It is the collaborative relationship framework, which defines the set of rules and procedures for empowering the parties to move forward in their relationship based on trust, cooperation spirit, dependence, open communication and sharing of information. Relational governance mechanisms protect the investments involved in transactions and thereby facilitate and promote sustainable and cooperative relationships (Obi, Qiang, Dogbe & Pomegbe, 2020).

Supply Chain

It is a system of organizations, people, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain

activities involve transformation of natural resources, raw materials and components into finished products delivered to the end customer (Durach & Wiengarten, 2019).

Supply Chain Governance

It is a governing system of rules, structures and institutions that guide, control and lead supply chains through policies and regulations with the goal of creating greater efficiency. Different actors such as international organizations and individual firms within the global supply chain put the governing systems into place (Bonatto, Resende & Pontes, 2022).

Supply Chain Management

It is the design, planning, execution, control and monitoring of supply-chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally. It is the management of the flow of goods and services, the movement and storage of raw materials of work-in-process inventory and of finished goods from point of origin to point of consumption (Wieland, 2021).

Transactional Supply Chain Governance Transactional SCG is the guidance, control and management of supply

chain relations, providing the framework within which supply chain transactions are negotiated and executed. It is a structure with institutional framework within which the integrity of a transaction is decided. It coordinates combination of different mechanisms that together constitute a strategy for encouraging the fulfillment of agreements to transact. (Murrell, Karalashvili & Francis, 2023).

Transformational Supply Chain Governance

Transformational SCG is the capacity and capability to develop initiatives that keep up with continuously changing the activities that could increase performance of a firm. It brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs (Pupkin, 2023).

ABSTRACT

In today's interconnected world, where goods and services traverse global boundaries, ensuring ethical and responsible practices within supply chains has become imperative. The concept of supply chain governance encompasses a range of strategies and mechanisms aimed at promoting transparency, accountability, and sustainability throughout the entire supply chain process. Agro processing industry establishes the biggest bit of 38% of Kenya manufacturing sector, but has untapped potential to contribute to employment and gross domestic product growth. The sector is inefficient in terms of value addition to the agricultural produce as Kenya exports raw agricultural produce instead of high-quality value-added products. The study aimed at determining the influence of supply chain governance on performance of agro processing firms in Kenya. The specific objectives were to establish the influence of contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance, and moderating effect of information flow on the performance of agro processing firms in Kenya. The study was anchored on five relevant theories: theory of constraints, game theory, transaction cost theory, agency theory and theory of performance. The study adopted a survey research design that enabled the combination of both quantitative and qualitative research approaches. The positivism research philosophy was used in this study. The study targeted 344 agro processing firms in Kenya. The firms were registered with the Kenya Association of Manufacturers and grouped into twelve functional sectors. This study used a census survey. Questionnaires were used to collect data from respondents. A pilot study was carried out on 10% of the entire target population to test the reliability and validity of the research instrument. The data collected was analyzed with the use of SSPS version 25. Data analysis was conducted using descriptive statistics and inferential statistics by use of moderated multiple regression analysis. The study revealed that contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance had significant effect on performance of agro processing firms in Kenya. The results indicated that information flow had a statistically significant moderating effect on the independent variables on the performance of agro processing firms in Kenya. The study concluded that contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance effect the performance of agro processing firms in Kenya. The study recommends that agro processing firms should implement the supply chain governance system to enhance their productivity and profitability. The study provides future researchers with a useful conceptual and methodological reference to carry out studies in this area of supply chain governance. This study also provides an original framework for agro processing firms to rank the key performance enablers according to supply chain governance in their context and to compare their performance with other firms.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In the 21st century, changes in the business environment have contributed to the development of supply chain networks (Wieland, 2021). Globalized supply chains strongly shape contemporary circumstances of production and consumption. Globalization has led to increasingly complex supply chains, with numerous stakeholders involved at various stages. This complexity often makes it challenging for organizations to monitor and control every aspect of their supply chains effectively (Farhad, 2019). The concept of supply chain governance (SCG) encompasses a range of strategies and mechanisms aimed at promoting transparency, accountability, and sustainability throughout the entire supply chain process. By implementing robust supply chain governance frameworks, organizations cannot only protect their brand reputation but also contribute to the betterment of society and the environment (Vela, 2023).

The supply chain has become a source of competitive differentiation and long-term sustainability of firms in a business environment that is constantly changing (Handfield, Cousins, Lawson, & Petersen, 2015; Memia, Ngugi & Odhiambo, 2018; Qayyum & Ashraf, 2015). The global supply chain is the process of transforming raw materials into a product, which often occurs in several different countries, moving products and services from producers to consumers. The increased globalization and international codependency have led to the idea that there should be governing system in place to help guide these global supply chains to perform more efficiently (Wible, Mervis & Wigginton, 2014). Supply chain policies are largely a matter of co-ordination between people who cooperate, and agreement about their competence. In the supply chain, processes can be centralized and decentralized. In a centralized supply chain, there is a single headquarter that serves as a central hub for all operations. While, decentralized supply brings the product closer to the end customer and making it more flexible for small businesses.

Supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer. It should be cost effective and should deliver the results on time (Kozlenkova, Hult, Lund, Mena & Kekec, 2015). Supply chain is the management of flows like the product flow, financial flow, information flow, value flow and risk flow. Supply chain performance is enhanced when chain activities are coordinated under a highly integrated information flow or sharing environment (Boström, *et al.*, 2014). Supply chain business process integration involves collaborative work between buyers and suppliers, joint product development, common systems, and shared information. According to Lambert and Cooper (2000), operating an integrated supply chain requires a continuous information flow.

The supply chain management (SCM) is management of the flow of goods, data, and finances related to a product or service, from the procurement of raw materials to the delivery of the product at its final destination (Wieland & Durach, 2021). SCM manages the flow of goods and services from point of origin to point of consumption. SCM system is required for the timely manufacture of goods and ensuring that consumer requirements are met effectively (Durach & Wiengarten, 2019). The main flows of SCM are the product flow, information flow and finances flow. The SCM flow is also concerned with customer returns and service needs. Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes (Simchi-Levi, Wang, & Wei, 2018).

The elements of SCM are integration, operations, purchasing and distribution. These elements must work cohesively for everyone's benefit (Wieland & Durach, 2021). Integration in SCM is a critical component for any business that relies on efficient and effective operations (Mogaka, 2023). By understanding the integration process, logistics managers can ensure their supply chains are integrated to maximize efficiency, reduce costs and maintain quality standards (Ajwang, Akoth, & Aila, 2022). Operations and SCM covers both manufacturing and service industries, involving the functions of sourcing, materials management, operations planning, distribution, logistics, retail, demand forecasting, and order fulfillment (Simchi-Levi, Wang, & Wei, 2018). Purchasing is the process of acquiring goods and services to

make SCM more efficient, and goods procured play a key role in improving the quality of products or services produced by the organization. Distribution management is part of the supply chain process that ultimately delivers goods to end-users or consumers. Distribution process includes numerous activities and processes such as packaging, inventory management, warehousing, supply chain, and logistics (Lam, 2018).

The components of SCM are planning, information flow, source, inventory, production, location, transportation and return of goods. The components are interdependent and ensure a smooth successful SCM system, and reputation of a business. A business must focus on all these components in order to create a flawless supply chain (Durach & Machuca, 2018). Researchers have used both the elements and components of SCM in measuring performance of firms. SCM is an overarching concept that links together multiple processes to achieve competitive advantage (Bush, Oosterveer, Bailey & Mol, 2014). SCM deals with the flow of materials through the global supply chain to ensure that the system produces per capita efficiently. The system works to improve the efficiency of the global supply chain with a difference, and deals with the products in the system and their efficiency in the system (Crisan, Paspucea & Liviu, 2011).

This study determined the effect of supply chain governance (SCG) on performance of agro processing firms in Kenya. To achieve this aim, the study assessed the effect of four conceptions (contractual, relational, transactional and transformational) of SCG on the performance of firms. Many researchers have used the four conceptions of SCG in studying the performance of different organizations since they are strategic rules, structures and institutions that help in achieving greater benefits from the competitive global supply chain. When adopted and implemented, SCG increases the productivity, sales growth, market share, return of assets and profitability of the firms (Addae-Boateng, Wen & Brew, 2015; Dong, Zhenzhong & Zhou, 2017; Ying-Pin Yeh, 2016). The SCG mechanism is considered to be the structure that ensures that decisions are made along the lines determined by the organization's corporate strategy, in order to increase or maintain the value of the company in the long term (Jiguang & Bing, 2018).

Governance is a system that provides a framework for managing organisations. It identifies who can make decisions, who has the authority to act on behalf of the organisation and who is accountable for how an organisation and its employees behave and perform (Vela, 2023). Governance enables the management team and the board to run organisations legally, ethically, sustainably, and successfully, for the benefit of stakeholders, including shareholders, staff, clients and customers, and for the good of wider society. There is no one universal system of governance. Instead, governance principles are supported by laws and regulations and are used by organisations to define how the board and management should operate. The most popular approaches to the concept of governance are corporate governance, global governance, good governance, and modern governance (Bevir, 2012).

Corporate governance is a system of rules, practices, and processes used by companies to ensure that their operations are conducted in an ethical and transparent manner to ensure that the interests of all stakeholders are taken into account (Shahwan, & Mohammad, 2016). Corporate governance refers to the way in which companies are governed and directed to what purpose (Inauen, Rost, Osterloh, & Frey, 2010). It identifies who has power and accountability, and who makes decisions. It creates transparent rules and controls, guides management, and aligns the interests of shareholders, directors, management, and employees. It helps build trust with investors, the community, and public officials, and give investors and stakeholders a clear idea of a company's direction and business integrity. It promotes long-term financial viability, opportunity, returns, and facilitate the raising of capital. Corporate governance reduces the potential for financial loss, waste, risks, and corruption, and it is a game plan for resilience and long-term success. The principles of corporate governance are fairness, transparency, risk management, responsibility and accountability (Organisation for Economic Co-operation and Development, 2015).

Global governance refers to institutions that coordinate the behavior of transnational actors, facilitate cooperation, resolve disputes, and alleviate collective action problems. Global governance broadly entails making, monitoring, and enforcing rules (Barnett, Pevehouse & Raustiala, 2021). The term 'global governance' is

broadly used to designate all regulations intended for organization and centralization of human societies on a global scale. Global governance is simply the management of global processes in the absence of global government, and concrete cooperative problem-solving arrangements. The major elements in global governance are the consensus, rules, and membership of multiple national governments, which require a binding mode of interaction (Weiss & Wilkinson, 2019). Multilateralism facilitates such interaction and helps sustain the rules-based global order. The basic principles guiding globalization must be democracy, social equity, respect for human rights and the rule of law. These need to be reflected in institutions, rules and political systems within countries, and respected by all sectors of society. All countries are afflicted by some forms of poor governance. It seeks to address collective concerns, and mediate common interests, creating both privileges and obligations for the public and private sectors. It is also essential for solving shared problems like pandemics, wars, and financial crises (Weiss & Wilkinson, 2018).

The good governance is one-way organisations in all sectors achieve their purpose. It is equally essential whether that purpose is commercial, charitable, or to provide public services (Meyer, 2018). Organisations that have good governance use clear decision-making processes, behave openly by reporting on their activities, actively engage with their stakeholders, effectively manage the risks they face, and take responsibility for controlling and protecting their assets, including their reputation. Each of these areas of governance activity contributes to an organisation's success. Good governance can also help in securing investment by creating formal reporting procedures that clearly lay out everything that investors need to know. The five main principles for good governance are legitimacy, direction, performance, accountability and fairness (Khandakar, 2010). Good Governance is measured by the factors of participation, rule of law, transparency, responsiveness, consensus oriented, equity and inclusiveness, effectiveness and efficiency, and accountability (Rotberg, 2014).

The modern governance creates a framework that provides organizations with the technologies, information, and processes needed for sound enterprise management (Aben, van der Valk, Roehrich, & Selviaridis, 2021). Digitization exposes companies to completely new challenges and risks in day-to-day operations as well as regarding

corporate governance and monitoring (Meyer, 2018). The concept of the modern governance refers to an institutional shift at all levels of government, from the local to the international and from bureaucracy to markets and networks. Modern governance is good governance achieved with modern tools. By utilising new technologies and methods, governing bodies can gain deeper insights and develop new processes that deliver better governance and better overall results for their organisations (Gupta, Kumar, Kusi-Sarpong, Jabbour & Agyemang, 2021).

The centralized governance enforces strict data access controls, security policies, and audit logging to mitigate security risks and maintain regulatory compliance (Bevir, 2012). It ensures that sensitive data is protected, and only authorized users can access the required data. In centralized governance, strategic planning, goal setting, budgeting, and talent deployment are typically conducted by a single, senior manager or management team. In a highly centralized governance, top management makes most of the key decisions in the organization, with very little input from lower-level employees. Centralization lets top managers develop a broad view of operations and exercise tight financial controls. Centralized governance can lead to streamlined processes, minimized administrative costs, limited communication, and quicker decision-making since there are fewer decision-makers involved. This can be advantageous in situations that require rapid responses (Meyer, 2018). However, centralized governance may lead to bureaucratic governance, delays in work as records are sent to and from the office, and employees may lack loyalty to a centralized organization since their creativity and suggestions are not considered (Vela, 2023).

Distributed governance involves dispersing authority and power across multiple entities or individuals. This model empowers individuals to navigate their lives by clearly delineating which authority is responsible for various aspects. Distributed governance is the specification of principles and methods which enable scalable coordination for forming consensus and to legitimate decisions (Weiss & Wilkinson, 2018). In such systems, all participants are treated equally without the presence of a central actor of hierarchy. In a decentralized governance model, value independence over shared resources. Each brand works independently, with separate teams,

budgets, technologies, strategies, and capabilities—with little sharing of resources or tools. The formal decision-making power is distributed across multiple individuals or teams (Meyer, 2018).

The formation of supply chain governance (SCG) is based on the continuous development of enterprise governance by combining the characteristics of supply chain and the bounded rationality of enterprise decision-makers (Wang, 2021). SCG is a term that originated around the mid-2000. The SCG is a governing system of rules, structures and institutions that guide, control and lead supply chains through policies and regulations with the goal of creating greater efficiency (Richey, Roath, Whipple & Fawcett, 2010; Jiguang, & Bing, 2018). As a branch of management, supply chain governance is a favorable factor for the internal and external integration of supply chain (Weiss & Wilkinson, 2019). SCG is regarded as the governance of supply chain structure, and a mechanism to maintain and coordinate the relationship between the core enterprises in the supply chain. SCG mechanisms are all practices used by supply chain members to manage relationships with their suppliers and clients with the aim of achieving the assumed goals, especially improving supply chain performance. Williamson (1996) defines governance structures as the institutional matrix within which transactions are negotiated and executed. Hence, SCG refers to the institutional framework in the supply chain where transactions are carried out.

According to Howard, Roehrich, Lewis and Squire (2017), SCG is generally a series of regulation and coordination of activities through a variety of formal and/or informal mechanisms based on a specific purpose. The governing systems are put into place by international organizations and individual firms within the global supply chain (Boström, Jönsson, Lockie, Mol & Oosterveer, 2014). SCG integrates coordination of operations and ensures that the proper policies are implemented and controlled. It means taking intentional actions to affect partner relationships. SCG ensures that all necessary resources are in place and individuals or teams are working on agreed priorities, progressing to agreed time scales, and delivering the required benefits (Barnett, Pevehouse, Jon & Raustiala, 2021). SCG focuses on understanding different aspects of SCM, while it gives less importance to the end customers and the

material flow itself. SCG is the framework that ensures all participants understand the expectations of their role in fulfilling demand, company policies are clear and consistently followed, and core business processes are monitored and deviations are proactively identified (Dolci *et al.*, 2017).

The instruments of SCG include policies and guidelines, rules or laws, norms, standards, monitoring and verification procedures, financial and other incentives, the exercise of authority, and integrated information flow or sharing (Wieland, 2021). SCG is the framework that ensures all participants understand the expectations of their role in fulfilling demand, the company policies are clear and consistently followed. SCG revolves around the core principles of transparency, accountability and sustainability (Lu, Jiang & Wang, 2024). Accountability entails taking responsibility for the social, environmental, and economic impacts of supply chain activities. While, transparency refers to the visibility and openness of supply chain operations. SCG promote ethical and responsible practices throughout the supply chain. By embracing its core principles, organizations can safeguard their reputation, mitigate risks, and create positive social and environmental impact (Vela, 2023). The key elements of SCG are working collaboratively to plan, establish and communicate overall policy guidelines, minimum expectations of performance, assessed risk, mitigation plans, and compliance metrics. For the success of SCG, proper monitoring and verification procedures of production units and primary processing, sourcing areas, and suppliers' management and control systems must be in place (Bonatto, Resende & Pontes, 2022),

The supply chain governance (SCG) is the maintenance of the relationship between the upstream and downstream partners of the enterprises in the supply chain, as well as the allocation of the risks brought by market uncertainty (Argyres, Bercovitz & Giorgio, 2020). The core enterprises pay more attention to the maximization of the overall benefits of the enterprises in the supply chain (Wang, 2021). The objective of SCG is to govern supply chains to operate in an efficient manner. The SCG system work to improve the efficiency of the global supply chain with a difference. SCG focuses on the system as a whole and the interactions between firms (Crisan, Paspucea & Liviu, 2011). SCG identifies the changes in roles and responsibilities

between the supply chain and other areas of the firm like manufacturing, marketing, sales, finance, information and research and development.

SCG is a key prerequisite for achieving organizational competitiveness and long-term wealth in the volatile business environment (Wible *et al.*, 2014). SCG strategies are the firm's objective to attain operational and strategic efficiencies through collaboration among internal functions and with other firms. SCG also identifies the changes in models of collaboration with other internal and external players regarding mutual commitments, key processes and performance indicators. SCG includes the recognizable proof of changes in models of joint effort with other interior and outside players in sharing responsibilities, key procedures and execution pointers (Crisan *et al.*, 2011). The SCG may not function well due to a number of global supply chain risks like economic instability, supplier inconsistency, political or government changes, environmental risks, lack of integrated connectivity, cyber-attacks, data integrity and quality, among others (Boström, *et al.*, 2014).

1.1.1 Global Perspective of Supply Chain Governance

Global SCG becomes more efficient with greater integration both internally and externally (Wible *et al.*, 2014). The internal integration is the unity of the firm that focuses on coordination and collaborative efforts between all the different departments of the firm like human resource and marketing, purchasing and manufacturing, among others. Internal integration is limited when insufficient knowledge exists across different functions of the firm (Chen, Daugherty & Roath, 2010; Mogaka, 2023). The external integration focuses on the firm's relationship with its partners and occurs when two or more companies share the responsibility of exchanging common planning, management, execution, and performance measurement information (Bush *et al.*, 2014).

The external integration helps to establish competitiveness in the global business environment by allowing firms to pool resources, exploit complementary skills and share information across firms. External integration is limited when insufficient knowledge exists across different firms and levels of the supply chain as seen in the Just in Time model, where inventory is eliminated at unnecessary levels of

production (Jiguang & Bing, 2018). The benefits to creating greater integration allows for the same benefits that come from implementing SCG strategies in a broader sense since integration is a part of that governance strategy (O'Rourke, 2014). The firms need to be effective and efficient than their competitors (Christopher, 2016). Additionally, firms have to understand the concepts and the practices of SCM for the purpose of achieving competitiveness and increasing profits (Qayyum & Ashraf, 2015).

Studies have found out that both internal integration and external integration are beneficial to efficiency that firms need to focus on both to avoid sub-optimal performance (Wible *et al.*, 2014). Without the teamwork of external integration efforts, internal integration only focuses on individual efficiencies despite being a part of a larger supply chain. External integration is facilitated by encouraging collaborative efforts (Ríos-Mercado & Ríos-Solís, 2012). Lack of direction from senior management and lack of communication across the entire supply chain can disrupt the efficiency of integration both internally and externally. Other barriers like lack of trust, failure to understand the importance of SCG, fear associated with losing control, misaligned goals and objectives, poor information systems, short-term as opposed to long-term focus, and supply chain complexity issues exist in the actual implementation of SCG (Howard *et al.*, 2017). SCG mechanisms protect the investments involved in transactions and thereby facilitate and promote sustainable and cooperative relationships (Huang & Chiu, 2018).

1.1.2 Regional Perspective of Supply Chain Governance

The developing countries within the region of Africa have recognized and implemented the concept of SCG to have sustainable market competition and economic growth in the agro processing industry. According to Gyau and Spiller (2012), both exporters and importers in Ghana can improve their economic performance and enhance efficiency in the supply chain if they adopt a more coordinated SCG structure with appropriate mechanisms for equitable distribution of benefits. The economic dimension of the relationship improves with adoption of a more coordinated type of governance structure (Gyau & Spiller, 2012). The

development of regional value chains is the means of achieving increased industrialization, employment and growth within the Southern African Development Community (SADC) region.

Understanding how the value chain operates, allows countries to identify opportunities for growth and development to form policy that will lead to desirable development outcomes (Ponte & Sturgeon, 2014). Understanding SCG is important as it determines at what level of the value chain policymakers should target their interventions, what types of interventions are required, and what the likely implications are for various players in the value chain (Ponte & Sturgeon, 2014). Policies within and across countries are not always aligned. When looking at the structures of value chains within countries, there are two extremes as formal value chains and hybrid value chains. Understanding the similarities and differences between the value chains across the SADC countries is important for the formation of regional policy. Policy measures made at a regional level are likely to have different impacts for firms within each country because of these observed differences (Ncube, Roberts, Zengeni & Samboko, 2017).

1.1.3 Local Perspective of Supply Chain Governance

The agro processing firms have been inefficient in terms of value addition to the agricultural produce and Kenya is a net exporter of raw agricultural produce instead of high-quality value-added products (Ndicu, *et al.*, 2015). In Kenya, the agro processing firms that are members of KAM have implemented the SCG concept to make them more competitive in doing business. The agro processing firms under this study have implemented the SCG to be technically and potentiality efficient in their operations. Supply chain accounts for more than 25% of the total demand in most private sectors and over 35% of public sector's total demand. According to Kingoo and Chirchir (2013), implementation of SCG is very limited in Kenyan parastatals but has a good impact on the organizational performance. They concluded that Kenyan parastatals should implement SCG to improve their performance.

According to World Bank Institute (2013), pharmaceutical procurement in Kenya is particularly prone to poor SCG since it entails complex processes that involve many

stakeholders like government ministries, procurement agencies, manufacturers, hospitals, distributors and citizens as the ultimate clients. When pharmaceutical procurement and supply chain systems work effectively, they offer high levels of quality, cost-effectiveness, product availability, transparency, accountability and value for money in the use of public funds. The effort to improve these systems is especially critical in emerging markets, where pharmaceutical spending is 20–30% higher than the global average. According to Chandani, Wakaria, Strader, Bunde, Riungu, Waithaka and Kariuki (2016), Kenya lacks a logistics management information system that can serve as the heartbeat for all its public health supply chains. Kenya needs the link between data and SCG to make public health supply chains more integrated and responsive in order to get life-saving commodities to those in need, considering its significant health challenges, poor maternal and child health indicators.

1.1.4 Agro Processing Firms in Kenya

Agro processing is the process of converting primary or raw agricultural materials or products into consumable commodities suitable for consumption (Ndicu *et al.*, 2015; Gichuru, Iravo & Arani, 2015). Maina, Gichira and Wanjau, (2017) stated that the level of technology influences the performance of agro processing firms. Agro processing activities comprise two major categories of primary and secondary operations. The scope of the agro processing industry encompasses all operations from the stage of harvest until the material reaches the end users in the desired form, packaging, quantity, quality and price. Agro processing is a widely diverse subsector and is vital to the production of food, beverages and non-food products like tobacco, sisal as well as the treatment of wood for furniture and paper products.

Agro-processing is an important process in agricultural sector for it adds value on agricultural output. Agricultural products form 65% of Kenya's total exports and only 20% of the total agricultural products exported are processed. Agriculture is the mainstay of the economy with a greater impact on poverty reduction than other sectors (KNBS, 2016). The agriculture sector contributes in earning foreign exchange, growth of GDP and offer employment opportunities. The agro-processing

sector in Kenya is having three subsectors of nourishment, refreshments and non-sustenance (KAM, 2019). This study will focus on twelve sub-sectors of alcoholic beverages and spirits; bakers and grain millers; cocoa, chocolate and sugar confectionery; dairy products; fresh produce; juices, waters and carbonated soft drinks; leather and footwear; slaughtering, preparation and preservation of meat; textile and apparels; timber, wood and furniture; tobacco and vegetable oils.

The choice of the industry for this study depended on its importance of adding value to the agricultural products before exportation or consumption, provision of employment and contribution to gross domestic product (GDP). Agriculture accounted for over 26% of the total GDP, 20% of employment, 75% of the total labour force, and over 50% of revenue from exports in 2016 (KAM, 2019). The agriculture sector employed 89,319 (33%) in 2013 out of 280,264 people employed by the manufacturing sector (KNBS, 2016). The agriculture sector grew at 3.5% in 2015, 3.2% in 2014 and contributed 10.3% to GDP (KNBS, 2016). In 2015, agriculture was the leading sector of the economy, accounting for 23% of wage employment and providing livelihood for almost 70% of Kenyans (Mitullah, Kamau & Kivuva, 2017). In 2016, agriculture contributed 33% to Kenya's GDP, 60% of exports and 7% of imports (KNBS, 2018).

1.2 Statement of the Problem

Globalization has led to increasingly complex supply chains with numerous stakeholders involved at various stages (Vela, 2023). This complexity often makes it challenging for agro processing firms in Kenya to monitor and control every aspect of their supply chains effectively. By implementing robust supply chain governance (SCG) frameworks, the firms can increase their efficiency and hence, improve their performance and better working environment. The concept of SCG encompasses a range of strategies and mechanisms aimed at promoting transparency, accountability, and sustainability throughout the entire supply chain process (Farhad, 2019). Information flow is one of the major components of SCM and it is crucial to the performance of SCM and SCG (Alexander, 2015). Information flow is a very important component of activities in agro processing firms.

The agro processing industry establishes the biggest bit of 38% of Kenya manufacturing sector (KAM, 2019). Manufacturing plays a key role in the growth of economies. The sector is expected to spur economic growth in Kenya due to its strong forward and backward linkages with other sectors of the economy. The sustained growth of the manufacturing sector increases a county's competitiveness, generates employment and enhances efficiency in use of resources (KNBS, 2020). The manufacturing sector has high and yet untapped potential to contribute to employment and GDP growth. The manufacturing sector has experienced performance issues that include trade imbalances, drop in GDP, unemployment, inflation and closure of international firms in Kenya (Magutu, Aduda & Nyaoga, 2015). The formal manufacturing employment increased by 1.6 per cent from 347.9 thousand in 2018 to 353.3 thousand in 2019.

The manufacturing sector is the largest among all the industrial production activities and accounts for 99 percent of all industrial activities in Kenya, but has been growing at a slower rate than the economy which expanded by 5.6% in 2015 (KNBS, 2016). In 2019, the manufacturing sector's real value added grew by 3.2 per cent compared to a revised growth of 4.3 per cent in 2018. The sector's volume of output expanded by 2.0 per cent in 2019 from a revised growth of 5.6 per cent in 2018 (KNBS, 2020). While the agriculture sector recorded mixed performance in 2017 that led to a decelerated growth of 1.6% compared to 5.1% growth in 2016 that also affected the agro processing industry (KNBS, 2018).

The performance of the manufacturing sector in Kenya is affected by the use of obsolete supply chain management practices (Vernon, 2017). GDP from manufacturing dropped from Kshs. 118,134 million in the first quarter of 2016 to Kshs. 113,460 million in the second quarter of 2016 (Trading Economics, 2017; Memia, *et al.*, 2018). The manufactures of food products declined by 10.8% while the dairy sub-sector production volumes contracted by 12.1% in 2017. Sugar production declined significantly by 41.2% from 639.7 thousand tonnes in 2016 to 376.1 thousand tonnes in 2017 (KNBS, 2018). Again, sugar production dropped by 10.2% from 491.1 to 440.9 thousand tonnes in 2018 and 2019, respectively (KNBS, 2020).

The Production of tea dropped by 7% from 473.0 thousand tonnes in 2016 to 439.8 thousand tonnes in 2017. Semi-processed coffee dropped by 15.1% to 33.7 thousand tonnes and production of beverages declined by 5.2% in 2017. Again, production of processed tea decreased from 493.0 thousand tonnes in 2018 to 458.9 thousand tonnes in 2019, while that of semi-processed coffee expanded by 7.1% from 41.4 thousand tonnes in 2018 to 44.9 thousand tonnes in 2019. The production of tobacco products dropped by 4.4 % because of a 4.1% decline in production of cigarettes in 2017. Leather and related products recorded a decline of 12.0%; and the manufacture of wood and products of wood dropped by 13.2% in 2017 (KNBS, 2018). Production of wood and products of wood dropped again by 4.8% in 2019.

The statistics clearly indicate that there is a performance gap in the agro processing sector in Kenya. This implies that the share of manufacturing in GDP has been reducing over time (Were, 2016). Thus, the poor performance of agro processing firms in Kenya is attributed to poor management of their supply chain operations and use of obsolete SCM practices (Wieland & Durach, Christian, 2021). This leads to low levels of performance of the agro processing firms. Successful SCM practices require a change from managing individual functions to integrating activities into key supply chain processes (Simchi-Levi, Wang, & Wei, (2018).

According to Ndicu, *et al.* (2015), the major problem of the sector in Kenya is inefficient value addition to agricultural produce. According to Gyau and Spiller (2012), the exporters and importers in agribusiness in Ghana can improve their economic performance and enhance efficiency in the supply chain if they adopt a more coordinated SCG structure. According to Kingoo and Chirchir (2013), SCG has a lot of impact on organizational performance of Kenyan parastatals though implementation is limited. Anupam and Fedorowicz (2015), observed that trust, bargaining power and contract are supporting the SCG information sharing and material flow coordination in supply chains in Indian firms.

This study aimed at bringing the quality of being successful into the agro processing sector by looking into the concept of supply chain governance in improving their performance. The concept of SCG has been discussed by many researchers stating

that good governance is one-way that organisations in all sectors achieve their purpose, and it is essential whether that purpose is commercial or provision of public services (Meyer, 2018). The complexity of supply chains still poses a lot of challenges that call for better systems like SCG that can help the firms in improving their competitive advantage within the global market. As a branch of management, SCG is a favorable factor for the internal and external integration of supply chain (Weiss & Wilkinson, 2019). When adopted and implemented, SCG increases the productivity, sales growth, market share, return of assets and profitability of the firms (Addae-Boateng, Wen & Brew, 2015; Dong, Zhenzhong & Zhou, 2017). SCG ensures that all necessary resources are in place and individuals or teams are working on agreed priorities, progressing to agreed time scales, and delivering the required benefits (Barnett, Pevehouse, Jon & Raustiala, 2021). The literature reviewed have not fully considered the contribution of SCG on performance of agro processing firms in Kenya that creates a research gap. Therefore, this specific study that focuses on SCG and performance of agro processing firms will add new knowledge to bridge the existing gap. The study sought to fill the gap in literature by conducting research on supply chain governance and performance of agro processing firms in Kenya.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study was to determine the influence of supply chain governance on performance of agro processing firms in Kenya.

1.3.2 Specific Objectives

1. To establish the effect of contractual supply chain governance on performance of agro processing firms in Kenya.
2. To examine the effect of relational supply chain governance on performance of agro processing firms in Kenya.
3. To investigate the effect of transactional supply chain governance on performance of agro processing firms in Kenya.

4. To determine the effect of transformational supply chain governance on performance of agro processing firms in Kenya.
5. To find out the moderating effect of information flow on the relationship between contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and performance of agro processing firms in Kenya.

1.4 Research Hypotheses

The study sought to test:

- H01:** Contractual supply chain governance does not significantly affect the performance of agro processing firms in Kenya.
- H02:** Relational supply chain governance does not significantly affect the performance of agro processing firms in Kenya.
- H03:** Transactional supply chain governance does not significantly affect the performance of agro processing firms in Kenya.
- H04:** Transformational supply chain governance does not significantly affect the performance of agro processing firms in Kenya.
- H05:** Information flow does not have a moderating effect on the relationship between contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and performance of agro processing firms in Kenya.

1.5 Significance of the Study

This study was important as it sought to provide the contributions of supply chain governance and performance of agro processing firms in Kenya. SCG increases the efficiency of firms and enables them to be more competitive in the global market. When properly implemented, SCG enables the agro processing firms to add good value to the agricultural products before consumption and exportation. The study

sought to determine the effect of SCG on performance levels and productivity of the agro processing firms in Kenya by analyzing various variables that effect the impact of SCG. This study adds value to the existing literature by providing empirical evidence on the effect of SCG and fills the existing contextual and conceptual gaps. The study is helpful to the various stakeholders like the manufacturing firms, the Kenya Association of Manufacturers (KAM), the researchers and scholars, Government, the policy makers, the consumers and suppliers, and many other groups or individuals.

1.5.1 Manufacturing Firms

The study helps the firms to understand the role of SCG in shaping their operations to remain competitive in the market. The study also assists as a benchmarking instrument in the adoption and implementation of SCG in order to improve their performance. This study helps the firm managers to strategize on how to reduce the negative environmental consequences by producing, moving and storing products in the supply chain by use of recycling and managing returns along supply chain. Increased knowledge of the SCG helps the managers to reduce purchasing cost, excess inventories and costs associated with non-value adding activities leading to improved performance of the organizations.

1.5.2 Kenya Association of Manufacturers

KAM found the results of the study very valuable. KAM is able to ascertain the extent of competition within the agro processing industry. KAM also understands the operations of SCG that mitigate the effect of the competition of the firms so as to determine whether such decisions adopted conform to the guidelines provided for the industry.

1.5.3 Researchers

The findings of this study are of great benefit to future researchers and scholars as it gives them access to literature and thus providing them with more information for future research. It helps them identify different areas that need improvements. It also

helps them understand deeply the effect of SCG on performance of agro processing firms in Kenya. The study assists the scholars and researchers in gaining knowledge that will go a long way by adding its contribution to the knowledge domain. The study created confidence to those who intend to carry their study on effect of SCG on performance of agro processing firms since they use the study as a reference document.

1.5.4 Government, Regulatory Authorities and Policy Makers

This study highlighted various policies and regulatory framework that guide the operations and practices of Kenyan manufacturing firms. The information is used by policy makers in government and private sectors to come up with strategies and policies that the sector to compete favorably in the global market in sustainable manner by meeting both environmental and quality requirements. This study provides information to the policy makers to be able to come up with trade and tariff policies that promote and protect the development of agro processing industries in Kenya. The information makes it possible to advocate for the adoption of policies that guide the industry.

The national government is able to put policies in place that can guide the industry. It also uses the information of this study to set up standards governing the manufacturing processes and develop physical infrastructure (power installations, cyber optic cables for e-commerce, rail and road infrastructures). The national government use the information to guide the industry in terms of international trade, taxation and environmental regulations. This study helps the private sector to develop the right skilled workforce to work in the agro processing sector.

1.5.5 Consumers and Suppliers

The operations of agro processing firms affect the consumers and suppliers directly or indirectly. The agro processing firms that incorporate SCG are able to be responsive to customers changing needs that include clean environment and quality products. They also benefit from reduced prices because of reduced operation costs and local sourcing of materials and professional services. Additional community

benefits that may arise because of good performance of agro processing firms may include charitable donations, bursaries, community projects, facilities, and support for local community services.

1.6 Scope of the Study

The study sought to determine the effect of SCG on performance of agro processing firms in Kenya. This study considered the variables of contractual SCG, relational SCG, transactional SCG, transformational SCG and the moderating effect of information flow. The study was a census of all 344 agro processing firms in Kenya that were members of the Kenya Association of Manufacturing (KAM, 2019). The choice of the agro processing sector for this study was based on its importance of adding value to the agricultural products before exportation or consumption. Agriculture is the main stay of the Kenyan economy. The sector also contributes to the GDP, offer employment opportunities, earn foreign exchange and provide livelihood for almost 70% of Kenyans. The sector forms 38% and constitutes the largest portion of the Kenya manufacturing sector.

1.7 Limitations of the Study

This study was subject to various limitations including resistance by respondents to answer questions relating to performance of agro processing firms due to confidentiality policy of agro processing firms. For this reason, some respondents were not cooperative during the study, and were not willing to reveal some information regarding effect of supply chain governance. In mitigation of the challenges, the study attempted to improve response rate using several ways that included proper explanation on the aim of the study. The questionnaires were accompanied by a cover letter from the University, which assured respondents of complete confidentiality and a permit from the National Commission for Science, Technology and Innovation (NACOSTI) indicating the purpose of the study and potential contributions.

The other limitation was the valuable time of respondents to respond to the questionnaires. Thus, the researcher allowed the respondents adequate time to

respond to the questionnaires, sensitized the respondents on the benefits and significance of the study. Reminder through follow up calls were made to encourage completion, return of the questionnaires, and to clarify any questions that had potentially risen. This study determined the effect of contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance on the performance of agro processing firms in Kenya with information flow as the moderating variable.

The study was not able to consider all other variables on supply chain governance that could affect the performance of agro processing firms. This provides an opportunity for other researchers to explore the relationship between the other variables supply chain governance and performance of other sectors of the economy in Kenya. This study assumed that all the agro processing firms were well established and have structured supply chains that enable them to accommodate new supply chain systems to improve their performance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a literature review focusing on a theoretical review of the theories of the study; the conceptual framework showing the relationship between independent variables, moderating variable and dependent variable; a literature review of study variables; an empirical review and critical analysis of existing literature; and the research gaps as well as the summary of literature.

2.2 Theoretical Framework

The theoretical framework defines the research problem in order to test a relationship in a theory and deal with specific concepts from a theory. The theoretical framework introduces and describes the theory that explains why the research problem under study exists (Braidotti, 2019). Theoretical framework clearly explains how well the research problem fits into a theory (Creswell & Daly, 2015). A theory is a set of statements or principles devised to explain a group of facts or phenomena repeatedly tested or are widely accepted and can make predictions about natural phenomena (Denzin, 2017). Theories are analytical tools for understanding, explaining, and making predictions about a given subject matter (Creswell & Creswell, 2017). Theories are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions (Braidotti, 2019). The study will review the theories like Theory of Constraints, Game Theory, Transaction Cost Theory, Agency Theory, and Theory of Performance to determine effect of SCG on performance of agro processing industries in Kenya.

2.2.1 Theory of Constraints

The theory of constraints (TOC) was conceived by Goldratt in 1984 as a methodology for identifying the most important limiting factor that stands in the way of achieving a goal and then systematically improving that constraint until it is no

longer the limiting factor (Goldratt, 1990; Šukalová & Ceniga, 2015). The TOC was relevant in understanding the effect of contractual supply chain governance on performance of agro processing firms in Kenya and hence provided the theoretical background for this study. TOC had been widely known as a management philosophy. In manufacturing firms, every process has a constraint or bottleneck and focusing improvement efforts on that constraint is the fastest and most effective path to improved profitability. TOC is a management paradigm that views any manageable system as being limited in achieving more of its goals by a very small number of constraints (Goldratt & Cox 1992; Memia, Ngugi & Odhiambo, 2018). Constraint is anything that prevents the system from achieving more of its goal (Gupta & Snyder, 2015). TOC uses a focusing process to identify the constraint and restructure the rest of the organization around it. TOC adopts the common idiom "a chain is no stronger than its weakest link". TOC is based on the principle that a chain is only as strong as the weakest link or constraint and to elevate and manage the constraint as necessary (Kairu, 2015; Mwangi, Muturi & Noor, 2019).

The key assumption of TOC is that management of an organization is by measuring throughput, operational expense and investment that together are throughput accounting (Alexandre, 2015). According to Goldratt (2010), TOC takes a scientific approach to improvement and gives explanation that every complex system including contracts and manufacturing processes, consists of multiple linked activities, one of which acts as a constraint upon the entire system. Many firms lack proper contractual SCG that leads to poor contracts between the firms and stakeholders like suppliers and consumers. This major constraint hinders global consumers to have ability to access produced goods. The TOC inherently prioritizes improvement activities, and top priority is always the current constraint. In environments where there is an urgent need to improve, TOC offers a highly focused methodology for creating rapid improvement (Gupta & Snyder, 2015).

According to Martinez, Navarro and Ravelo (2015), TOC approach may guide a single firm to concentrate on exploiting resources based on different contractual governance along the supply chain. TOC thinking process may be applied to identify problems in the contractual SCG and describe the bringing together of managers

from different firms to cooperate in improving the overall performance. The underlying key assumptions or premise of TOC are that organizations can be measured and controlled by variations on measures like contractual relationship, throughput, operational expense, and investment (Alexandre, 2015). Goldratt (2010) conceptualized performance measures to maintain trust amongst the participating members. The TOC is important in this study because it links with the study objective of contractual SCG. The theory will assist firms in determining the measures that will identify and eliminate the constraints in their supply chains.

2.2.2 Game Theory

The first known discussion of game theory occurred in a letter written in 1713 by Charles Waldegrave (Bellhouse, 2007; Bellhouse, 2015). Game theory did not really exist as a unique field until John von Neumann published the paper on the Theory of Games of Strategy in 1928. Modern game theory began with the idea of mixed-strategy equilibria in two-person zero-sum games and its proof by John von Neumann (Neumann, 1928). Many scholars developed game theory extensively in the 1950s. According to Neumann (1928), game theory is the study of mathematical models of strategic interaction between rational decision-makers. Today, game theory applies to a wide range of behavioral relations, and is now an umbrella term for the science of logical decision making in humans, animals, and computers (Dutta & Radner, 1994). The game theory was relevant in understanding the effect of relational supply chain governance on performance of agro processing firms in Kenya and hence provided the theoretical background for this study.

According to Jonathan (2018), game theory has been widely recognized as an important tool in many fields like manufacturing and agro processing firms. Game theory is having two types of cooperative game and non-cooperative game. A game is cooperative if the players are able to form binding commitments externally enforced through contract law, but it is non-cooperative if players cannot form alliances or agreements (Velegol, Suhey, Connolly, Morrissey & Cook, 2018). Cooperative game theory provides a high-level approach as it only describes the structure, strategies and payoffs of coalitions and provides a simplified approach that

allows analysis of the game at large without having to make any assumption about bargaining powers (Webb, 2014). Cooperative games bring together several players looking to maximize a win-win situation by agreeing to coordinate strategies and share pay offs (Mateo & Aghezzaf, 2014). Game theory is defined as the formal study of decision-making where several players are required to make choices that potentially affect the interests of the opposing players and is deemed as the official study of conflict and cooperation (Xu, Pan & Ballot, 2013; Slimani & Achchab, 2014).

According to Wang (2015), game theory contains the method for finding mutually consistent solutions for two-person zero-sum games that relates to relational supply chain governance since the collaborating partners need good relationship to perform well. The game theory primarily analyzes optimal strategies for groups of individuals presuming that they can enforce agreements between them about proper strategies (Velegol *et al.*, 2018). The concepts of game theory provide a language to formulate structure, analyze, and understand strategic scenarios. Game theoretic concepts apply whenever the actions of several agents (individuals or groups or firms) are interdependent. Game theorists usually assume players act rationally, but in practice, human behavior often deviates from this model (Xu, *et al.*, 2013). In game theory, horizontal cooperation in supply chain is efficient to improve the performance level (Webb, 2014). In this study, game theory will be used to facilitate the decision-making in measuring relational supply chain governance efficiency on effect of firm performance.

2.2.3 Transaction Cost Theory

The transaction cost theory of the firm was developed by Coase (1937) making it one of the first neo-classical theory that attempted to define the firm theoretically in relation to the market (Coase, 1937; North, 1992). The institutional economist, Commons (1931), introduced the idea that transactions form the basis of an economic thinking. According to Coase (1937), transaction costs include search and information costs, bargaining and decision costs and policing and enforcement costs. The market prices govern the relationships between firms but within firm, and

decisions made on a basis different from maximizing profit subject market prices (Williamson, 2002). Transaction cost theory (Williamson 1979, 1986) posits that the optimum organizational structure is one that achieves economic efficiency by minimizing the costs of exchange. The theory suggests that each type of transaction produces coordination costs of monitoring, controlling, and managing transactions. Transaction cost theory was relevant in understanding the effect of transactional supply chain governance on performance of agro processing firms in Kenya and hence provided the theoretical background for this study.

The theory states that people prefer to direct others and are prepared to pay for this (but generally people are paid more to direct others); and purchasers prefer goods produced by firms (Coase, 1937). This linked well with transactional SCG whereby managers direct the workers to perform certain duties of the firm then provide rewards to those who have performed. The government measures relating to the market (taxes, rationing, price controls) tend to increase the size of firms in terms of transaction costs (Coase, 1937). He defined the firm as the system of relationships that comes into existence when the direction of resources is dependent on the entrepreneur. The size of the firm is dependent on the costs of using the price mechanism. Theory is part of corporate governance and agency theory that is based on the principle that costs will arise when directors get someone else to run their business (Basil, 2016). The theory describes governance frameworks as being based on the net effects of internal and external transactions, rather than as contractual relationships outside the firm with shareholders (Schmitz, 2016).

Transaction cost theory and agency theory essentially deal with the same issues and problems. Where agency theory focuses on the individual agent, transaction cost theory focuses on the individual transaction. Agency theory looks at the tendency of directors to act in their own best interests, pursuing salary and status. Transaction cost theory considers that managers (or directors) may arrange transactions in an opportunistic way (Gattai & Piergiiovanna, 2015). The main activities of transaction cost economics are within five processes of category strategy, supplier strategy, quotation supplier selection and negotiation, operative procurement and supplier evaluation (Richman & Mache, 2008). The firm should make a component if

transaction costs cannot be kept low by using a hybrid governance approach, then it can be kept low through the safeguards provided in the contract and use the market if the component which has to be supplied has low asset specificity (Williamson, 2009; Müller & Schmitz, 2016).

According to North (1992), institutions understood the theory as the set of rules in a society that were important in the determination of transaction costs, and institutions that facilitate low transaction costs boosted economic growth. The factors that comprise transaction costs are measurement, enforcement, ideological attitudes and perceptions, and the size of the market. The transaction cost theory accounts for the actual cost of outsourcing production of products or services including transaction costs, contracting costs, coordination costs, and search costs (Williamson, 1986). The theory fits well with transactional supply chain governance since it governs transactions through relational norms, which refer to some social processes, and regulations that exist because of the counterparts' relations in a transaction and has a value-adding function. The firms that manage processing activities efficiently minimize the transaction costs and production costs to achieve their objectives (Addae-Boateng, Wen & Brew, 2015). Williamson (1986) who was recognized with a Nobel Prize for his work on transaction costs, theorized that whether activities would be internalized within a firm depended on their transaction costs.

Müller and Schmitz (2016) identified three characteristics of transactions; asset specificity, uncertainty, and the number of input sources: that determined when firms or markets prevailed. Market contracting was more efficient when assets were non-specific to any particular transaction. Similarly, when small numbers of sources and imperfect information were not significant, market contracts dominated over firms. When firm practices logistics efficiency, effectiveness and flexibility in their transactions and operations, achievement of their goals is realized at a lower cost (Douma & Schreuder, 2012). The goals of the firm are also influenced by external factors such as competitors, stockholders, suppliers, customers, and industry structure. Defining the goals of the firm became more complex as these groups placed different demands on the firm. The theories of the firm help in understanding

how the goals and resources of the organization drive the firm's behavior (Pessali, 2009; Anderlini & Felli, 2006; Gattai & Piergiovanna, 2015).

2.2.4 Agency Theory

The theory of agency was first proposed and created by two scholars, Ross and Mitnick in 1973 (Ross, 1973; Mitnick, 1973; Mitnick, 2006). The economic theory of agency was developed by Ross in 1973, while the institutional theory of agency was developed by Mitnick in 1973 though the basic concepts underlying these two approaches are similar (Mitnick, 2006; Mitnick, 2013). The game theory deals with the incentives as well as the institutional structures and helps in selecting a compensation system that will produce behavior by the agent consistent with the principal's preferences (Ross, 1973; Mitnick, 1973; Ross, 1974; Mitnick, 1974). Thus, the focus is on the nature of the incentive system and the contracting system that guides the distribution of those incentives, the conditions of risk and information that lead to the choices of the actors. The theory is policing in the context of agency relations and managerial discretion with three stages of diversion of resources to policing; implementation of policing mechanism; and agent's reaction to policing (Jensen & Meckling, 1976; Mitnick, 2006; Mitnick, 2013). Agency theory was relevant in understanding the effect of transformational supply chain governance on performance of agro processing firms in Kenya and hence provided the theoretical background for this study.

The agency theory describes the relationship between two or more parties (principal and agent), in which one party, designated as the principal, engages another party, designated as the agent, to perform some tasks on behalf of the principal (Kivistö & Zalyevska, 2015). The theory assumes that once principals delegate authority to agents, they often have problems controlling them because agents' goals often differ from their own and agents often have better information about their capacity and activities as compared to the principals (Van Genugten & Van Thiel, 2019). Agency theory suggests that, in imperfect labor and capital markets, managers will seek to maximize their own utility at the expense of corporate shareholders (Bicudo de Castro, 2017). Agents have the ability to operate in their own self-interest rather than

in the best interests of the firm because of asymmetric information e.g., managers know well than shareholders whether they are capable of meeting the shareholders' objectives. Managers can be encouraged to act in the stockholders' best interests through incentives, constraints and punishments (Schmitz, 2013).

Agency theory suggests that the firm is a loosely defined contract between resource holders (Giinter & Spremann, 1987). The primary agency relationships in business are those between stockholders and managers and those between debtors and stockholders. These relationships are not necessarily harmonious indeed; agency theory is concerned with so-called agency conflicts, or conflicts of interest between agents and principals (Kivistö & Zalyevska, 2015). When agency occur it also tends to give rise to agency costs, which are expenses incurred in order to sustain an effective agency relationship such as offering management performance bonuses to encourage managers to act in the shareholders' interests (Giinter & Spremann, 1987). Agency costs are those costs borne by shareholders to encourage managers to maximize shareholder wealth rather than behave in their own self-interests (Hayne, 1998).

2.2.5 Theory of Performance

The theory of performance (ToP) originated from a variety of fields, but it is mostly associated with the work of Schechner (1985) and Turner (1988). They highlighted how performances are central to human understanding. Performance theory suggests that every firm puts on a performance in business to be competitive in the global market. Performance can entail observance to a rigid structure of operating but it can also be a means of achieving set goals by the firms. The concept of performance enables an assessment of the ways in which individual firms operate and compete in the world market. It is a means of understanding how firms situate themselves at the national, regional and global levels for themselves and for others (Butler, 1997). Performance offers modern perspectives in multiple environments (Shepherd 2016). The ToP was relevant in understanding the effect of supply chain governance on performance of agro processing firms in Kenya and provided the theoretical background for this study.

According to Agami, Saleh and Rasmy (2012), ToP develops and relates six foundational concepts of perform, performer, level of performance, performer's mindset, immersion and reflective practice. These concepts form a framework that can be used to explain performance as well as performance improvements of companies. To perform is to produce valued results as per the set goals. A performer can be a firm or a group of firms engaging in a collaborative effort. Developing performance is a journey and level of performance describes location in the journey to achieve the set objectives. The current level of performance depends holistically on six components of context, level of knowledge, levels of skills, level of identity, personal factors and fixed factors of the companies (Nielsen, 2013).

According to Schrettle, Hinz, Rathje and Friedli (2013), the performance theory calls for greater awareness of attention to formal elements of textual representation (structural concerns) and greater focus on context. ToP situates stories to a particular process within the firm and credits an employee of the firm who assumes responsibility for the performance. Performance at each processing level is key to the company and relies on worker's assumption of responsibility for the emergent event (Osoro, Muturi & Ngugi, 2016). There is need to established how ToP can help in discussing, appreciating and understanding the role played by agro processing sector in the economy. ToP links well with the performance of agro processing firms in Kenya and it will guide this study to the right direction.

2.3 Conceptual Framework

The conceptual framework refers to the conceptualization of the relationship between variables in the research study (Creswell & Creswell, 2017). It is a diagrammatic presentation of the relationship between independent and dependent variables of the study. It is useful in defining the important topics to be examined and the research question to be considered. Robson & McCartan (2016) defined a conceptual framework as a system of concepts, assumptions, expectations that supports and directs research. Conceptual framework helps the researcher to understand the proposed relationship between variables; to establish the significance of the proposed relationship; and to test the conceptual model (Kothari & Garg, 2014).

A conceptual framework ensures that the study is founded in logic and structure that adds knowledge in the topic of study (Creswell, & Poth, 2017). It provides a methodical framework for sorting out data for analysis, and directs the choice of research strategies and data gathering procedures (Merriam, & Grenier, 2019). The dependent variable of the study is the performance of agro processing firms, while the independent variables are contractual SCG, relational SCG, transactional SCG and transformational SCG, and the information flow as the moderating variable. Figure 2.1 presents the conceptual framework for this study.

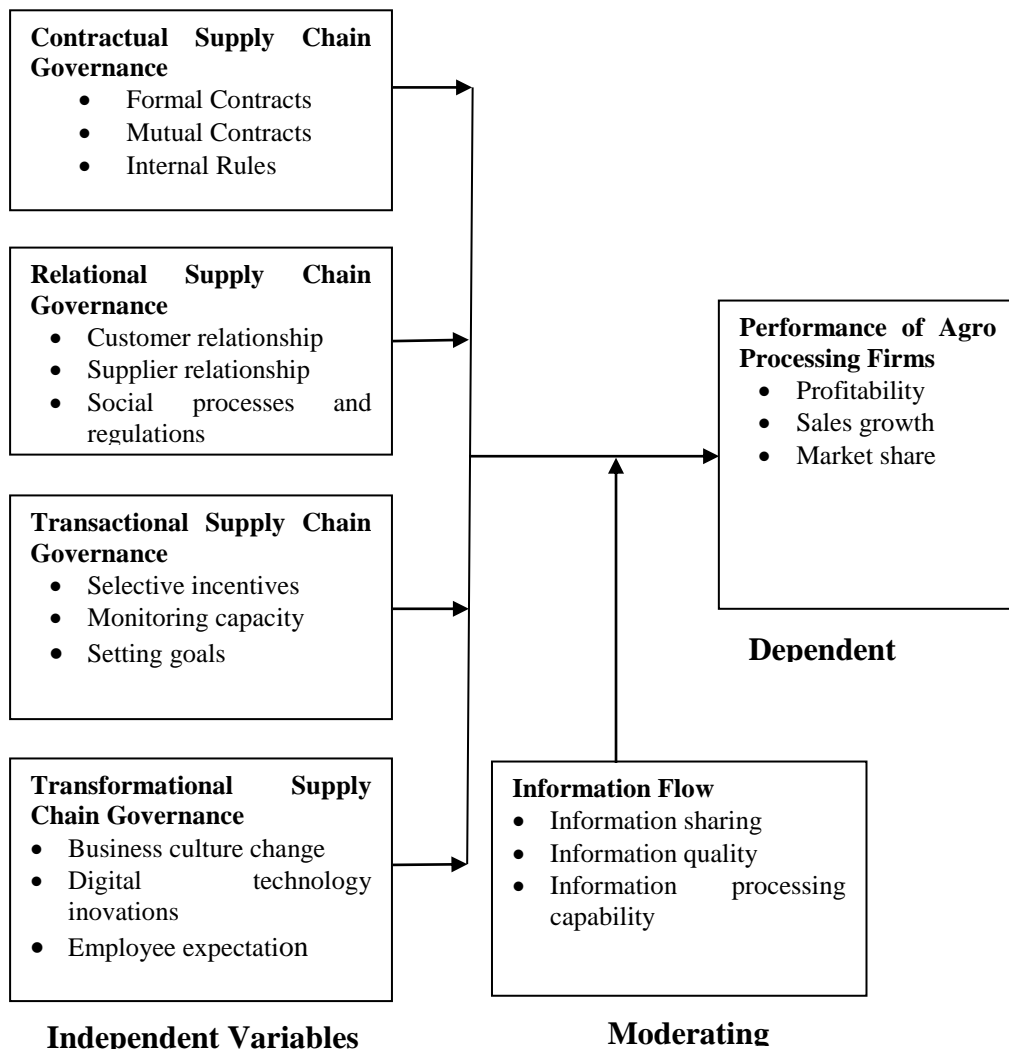


Figure 2.1: Conceptual Framework

2.3.1 Contractual Supply Chain Governance

Contractual SCG is used to manage the relationships between parties to a transaction and reduce opportunism (Heide & John, 1992; Shahwan, & Mohammad, 2016). It is the management of contracts made with customers, vendors, partners, or employees through negotiation to ensure compliance with the terms and conditions agreed on. It focuses on the internal structure and rules of the board of directors; the creation of independent audit committees; rules for disclosure of information to shareholders and creditors; and control of the management (Addae-Boateng, Wen & Brew, 2015). Contractual governance is a formal mechanism or constitutive rules defined in written documents and sanctioned through a formal position of authority and ownership (Benítez-Ávila, Hartmann, Dewulf & Henseler, 2018). Contractual governance can be summarized as the process of systematically and efficiently managing contract creation, execution, and analysis for the purpose of maximizing financial and operational performance and minimizing risk (Zhang, Zhang, Gao & Ding, 2016).

According to Yin and Xu (2014), contractual governance is how firms manage their contractual relationships through policies, procedures, tools, and formal contracts where the parties sign under seal, and mutual contracts in which both parties agree to undertake certain responsibilities, rights, or obligations. The concept of governance refers to those coordinating mechanisms internal to the firm that reduce market originated transaction costs (Sicoli, 2013). According to Tricker (2012), contractual governance is concerned with the exercise of power over corporate entities. Contractual governance is based on control in the extent to which collaboration and resulting project performance is the result of limiting the number of possible future project outcomes by allocating risks and setting enforceable standards aligned to the mission of the project (Brahm & Tarzijan, 2015; Guo, Chang-Richards, Wilkinson & Li, 2014). The contractual mechanisms move with fewer degrees of freedom and anchor the exchange throughout the life cycle. The dynamics of contractual SCG mechanisms in vertical buyer-supplier research and development projects require both knowledge sharing and protection. Contractual mechanisms reduce opportunism and favor relationship performance (Dahlquist & Griffith, 2017).

Contractual SCG is the formal means of safeguarding the exchange between buyer and seller as they conduct joint research and development activities (Cao & Lumineau, 2015; Heidi, Pia, Kirsimarja & Paavo, 2010). The concept of contractual SCG thus refers to contracts (explicit, formal and written collaboration contracts) and Intellectual Property Rights (IPRs) used for managing buyer-supplier relationships. According to Lu, Guo, Qian, He and Xu (2014), IPRs (patents, copyrights, trademarks and trade secrets) are a part of contractual SCG, since their existence potentially provides protection against opportunism where innovations are concerned. The property rights and other formal protection are costly and may not always be efficient. Thus, firms need to use an array of organizational arrangements to protect valuable knowledge. Contractual consists of having a firm strategy that addresses every aspect of the contract process. Firms should have oversight over the entire process for every contract to ensure transparency into relationships and an understanding of where risk may arise in the future (Fischer, Huber, Dibbern & Hirschheim, 2012).

In contractual relationships, Porter advocated in the mid-1980s that purchasers should multi-source, negotiate short-term contracts, maintain secrecy regarding costs, sales and product design and make (or receive) no improvement suggestions to (or from) suppliers (Lysons & Farrington, 2012). The preferred and potential suppliers identified through the process of vendor rating and accreditation. Single sourcing is good especially for complementary goods and services of relatively high strategic importance with the aim to reduce transaction costs. The strategic supplier alliances create relationships that form a completely new and independent legal entity distinct from the firms comprising the alliance (Cao & Lumineau, 2015). According to Lu *et al.*, (2014), trust, bargaining power and contract are three key constructs supporting the governance of information sharing and material flow coordination in supply chains. Trust as a governance mechanism plays a crucial role in sharing information among business partners. Coordination is the act of properly combining a number of elements (actions, objectives, decisions, information, knowledge, and funds) in contractual governance for the achievement of the chain goal (Brahm & Tarzijan, 2015).

According to Bonatto, Resende and Pontes (2022), there are seven contextual factors that influence the choice of contractual SCG and relational SCG mechanisms in supply chains, namely: relationship history, environmental uncertainty, perceived risk, perceived justice, asset specificity, power asymmetry and interdependence. They further proposed that contractual and relational governance are complementary and that the presence of trust (affective and competence-based) moderates the relationship between contextual factors and SCG. Contracting facilitates commitment and task allocation, which in turn, are relevant in successful conflict management. Contractual SCG covers everything from drafting to monitoring the lifecycle of a contract. By practising effective contract governance, all parties involved in a contract understand their rights and responsibilities.

2.3.2 Relational Supply Chain Governance

Relational SCG is a governance structure used to manage the relationships between parties to a transaction and reduce opportunism (Heide & John, 1992; Addae-Boateng, *et al.*, 2015). It defines the set of rules and procedures for empowering the parties to move forward in their relationship. Relational governance mechanisms protect the investments involved in transactions and thereby facilitate and promote sustainable and cooperative relationships (Huang & Chiu, 2018). Relational SCG governs transactions through relational norms that refer to the values, expectations, social processes and regulations that exist because of the counterparts' relations in a transaction (Heide & John, 1992; Baker, Nordin & Ravald, 2016). Relational governance consists of a structure and a process (Gibbons & Murphy, 2012). The relational structure dimension represents a vertical semi-integration while processes underlined in the relationship are joint actions. Relational contracting describes mechanisms that utilize non-legal sanctions that result in decreased opportunism along with improved effectiveness (Kreye, Roehrich & Lewis, 2015). According to Obi, Qiang, Dogbe and Pomegbe (2020), the relational governance has a positive effect on supply chain performance and at the same time has an indirect effect on supply chain performance through both information sharing and quality of information.

The concept of relational SCG describes the non-contractual relational mechanisms (trust in its various forms and relational-cooperative norms) that affect the exchange relationship between buyer and supplier (Poppo, Zhou & Zenger, 2012; Huang, Cheng & Tseng, 2014). Relational governance portrays the methodology by which decisions are proposed, adopted and implemented. It describes the rights and remedies of the shareholders to decide upon selection of directors and on major corporate changes that affect their interests, and on the rights and duties of directors (Sjödin, Parida & Kohtamäki, 2019). In outsourcing, relational governance describes the protocols and procedures for communications between the parties at all levels, and the process for determining the existence disputes (Dyer, Singh & Hesterly, 2018). Without an effective means of relationship governance, the communications fail and the relationship fails (Vesalainen & Kohtamäki, 2015). Relationship management principles may be set forth in the main text of the agreement or in an exhibit. Relational norms directly effect partners' attitudes and behaviour to engage in collaborative activities in the process of delivering project outcomes (Lu *et al.*, 2015).

According to Anderson, Christ, Dekker and Sedatole (2015), relational SCG defines the set of rules and procedures for empowering the parties to move forward in their relationship for improved performance of firms. Poppo and Zenger (2010) stated that relational governance hinges on trust, cooperation or cooperative spirit, open communication and sharing of information and dependence. Where available, these should promote the flexibility, solidarity and information exchange needed to enforce obligations, promises and expectations. In their absence, it will be difficult for exchange partners to adapt to unforeseeable events, get a bilateral approach to problem solving, and acquire new information and opportunities that could aid the attainment of goals in short-term and long-term. Through these social processes and the resulting norms, relational governance may function to mitigate the precise exchange hazards targeted by contractual governance (Szczepański & Światowicz-Szczepańska, 2012; Kreye, Roehrich & Lewis, 2015).

According to Talay and Akdeniz (2014), relational SCG mechanisms such as trust enhance transaction-specific investments associated with less monitoring and

bargaining. The existence of trust between two partners help to facilitate joint planning and problem solving and can help to create a stable and committed relationship, which is important for firm performance. According to Cao and Lumineau (2015); (Lu *et al.*, 2014), relational SCG complements the adaptive limits of contracts by fostering the continuance of exchange and entrusting both parties with mutually agreeable outcomes. Relational SCG affects manufacturers' ability to flexibly adapt and overcome uncertainty in the supply chain relationship (Ying-Pin Yeh, 2016; Yin and Xu, 2014). The consumer orientation and management innovation directly and positively correlate with relational governance (Dong, Zhenzhong & Zhou, 2017). According to Huang, Cheng and Tseng (2014), relational SCG governs transactions through relational norms (social processes and regulations) which have a value-adding function. According to Anderson *et al.* (2015), firms use inter-organizational and relational controls to address cooperation and coordination concerns in order to enhance collaboration and the performance of firms.

2.3.3 Transactional Supply Chain Governance

Transactional SCG is the guidance, control and management of supply chain relations, providing the frame-work within which supply chain transactions are negotiated and executed. It is a governance structure with institutional framework within which the integrity of a transaction is decided (Williamson, 1979). It is a coordinated combination of different mechanisms that together constitute a strategy for encouraging the fulfillment of agreements to transact. It increases the efficiency of firms and enable them to be more competitive in the global market (Dolci, Maçada & Paiva, 2017), Transactional SCG focuses on supervision, organization and performance of firms. It encompasses all forms of managerial governance that includes selective incentives and monitoring capacity. Transactional SCG focuses on results that conforms to the existing structure of an organization and measures success according to that organization's system. Transactional SCG coordinates the way financial, material, and human resources are earmarked within the flow and the framework for decision-making (Williamson, 1986). Mechanisms for SCG can include contracts, standards, and mechanisms for reporting. The emphasis under

transactional SCG is on managing the performance of the individual employees and determining how well they perform in a structured environment.

The transactional SCG managers tend to be more passive, responsive and reactive to achieve performance of their firms. They play a vital role in encouraging and supporting the initiatives of individual employees to explore new opportunities, to develop new products, and to improve work procedures for the benefit of the organization (Murrell, Karalashvili & Francis, 2023). A manager is responsible for maintaining routine by managing individual performance and facilitating group performance. The manager sets the criteria for their workers according to previously defined requirements. Performance reviews are the most common way to judge employee performance. Managers work best with employees who know their jobs and are motivated by the reward system. The rewards depend on an agreement between the manager and employees. The employees get bonuses, and merits or recognition from the firms to meet certain goals depending on what the firms need to achieve. The benefits of rewards tend to be quick when achieving short-term goals and workers have clearly defined rewards. This encourages productivity and provides a clear and easy way to understand the structure in place (Murelli, 2003).

The reward system under transactional SCG involves an exchange process whereby employees get immediate tangible rewards for carrying out their responsibilities efficiently. There are two factors of reward system namely contingent reward and management-by-exception. Contingent reward provides rewards for effort and recognizes good performance. Management-by-exception maintains the status quo, intervenes when employees do not meet acceptable performance levels, and initiates corrective action to improve performance. The behaviors of employees include clarification of expected performance, explaining how to meet such expectations, and allocating rewards that are contingent on meeting objectives. A transaction is the unit of interaction in which two or more people encounter each other and eventually one of them will speak or give some other indication of acknowledging the presence of others. This is the transactional stimulus. Another person will then say or do something that is in some way related to the stimulus and called the transactional response.

Transactional SCG is good for work environments where structure and systems reproduce high volume in manufacturing and serves to align everyone in large organizations. It maintains the status quo of an organization. The transactional relationship in the supply chain is the period between the time it takes to pay suppliers, and the time it takes to get paid by the buyers. According to Dolci, Maçada and Paiva (2017), SCG comprising transactional aspects has a positive influence on operational and financial supply chain performance (SCP). They found out that SCG is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. They concluded that SCG affects SCP, primarily in the operational aspects with regard to global costs and in the financial aspects of investment return.

2.3.4 Transformational Supply Chain Governance

Transformational SCG is the capacity and capability to develop initiatives that keep up with continuously changing the activities that could increase performance of a firm. It brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs (Gupta, Kumar, Kusi-Sarpong, Jabbour & Agyemang, 2021). Transformational SCG is a principles-based philosophy that calls on business to be more accountable, inclusive and transparent to drive responsible business conduct, improve firm performance and strengthen supply chain systems. It is a prism through which businesses can broaden their understanding of the supply chain systems through an expanded vision and ambition for governance that aims to have impact to a company. According to Pupkin (2023), transformational governance model seeks to address current challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making.

According to Aben, van der Valk, Roehrich, and Selviaridis (2021), businesses of all sizes need to digitize their supply chains and also rethink the roles of their people and processes to ensure that products will be available and will arrive at their intended destinations in time to meet customer demand. There is need for comprehensive

overhaul and modernization of a business's supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Today, companies increasingly recognize that a well-managed supply chain can be a critical driver of business value. Many companies have invested in greater supply chain digitization over the years to cope up with supply chain disruptions (Lu, Wang & Wang, 2023). Transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms (Dubey, Gunasekaran, Childe, Papadopoulos, & Fosso-Wamba, 2017). Equally, it faces many challenges at the implementation stages as resistance to change, integration of new technologies, data integration and analytics, disruption to existing processes, cost, talent and skills (Papadopoulos, Gunasekaran, Dubey & Wamba, 2017).

Transformational SCG is a process in which managers and employees help each other to advance to a higher level of performance of the firm. It empowers employees to achieve high outcomes that result to better organizational performance (Farhad, 2019). Transformational SCG managers are concerned with how they interact with the employees to ensure improved performance. The more employees trust and respect the firm managers and are willing to follow the guidelines depends on positive outcomes of the employees. The managers are essentially change agents and borrow heavily from known change models in managing effective transformation within the firms. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms. They further stated that the managers must create an environment in which employees can accept and execute their responsibilities with confidence. The managers must communicate with their employees, imparting the company's vision and listening to what they need to make that vision a reality. For a manager to succeed in transforming the organization, he/she must be a visionary, a strategist and an inspirer. The managers must make a domain where workers can acknowledge and execute their obligations with certainty and artfulness (Awan, Kraslawski & Huiskonen, 2018).

Transforming a supply chain operation and bringing it up to date, generally involves the introduction of powerful new technology and a fundamental review of processes and organization (Gupta, Kumar, Kusi-Sarpong, Jabbour & Agyemang, 2021). Successful transformation seeks to align the supply chain with the overall goals of the firms. The good supply chain system plays an essential part in identifying the steps to optimize supply chain to serve the business needs. In sourcing a supply chain technology, the supply chain management system should assess demand planning and analytics for better outcome (Michelle, Zeplin, Hotlan, Ferry, 2024). Transformational acquisitions of the new equipment may result in a fundamental change in the working of the organization, as would be the case with the installation of a new computer system or the adoption of computer-integrated production (Lysons & Farrington, 2012). Transformational SCG is all about initiating change in organizations, groups, oneself and others to improve the performance of a firm or organization (Aendenroomer & Frangeskou, 2023).

2.3.5 Information Flow

Information flow is one of the major components of SCM together with planning, sourcing, inventory and production. The types of information that flows between firms and customers and suppliers in the SCM are quotations, purchase orders, delivery status, invoices and customer complaints. In order to have a successful supply chain, there must be a constant interaction between firms and suppliers and customers. Information is crucial to the performance of SCG because it provides the basis on which supply chain processes execute transactions and managers make decisions. According to Anupam and Fedorowicz (2015), information is data that is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and decrease in uncertainty. Information is valuable because it can affect behavior, a decision, or an outcome. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. Information processing capability plays a mediating role between SCG and performance of firms (Lu, Jiang & Wang, 2024).

Information flow is the movement of data in different directions with variable contents between various database (departments), people and systems within a company (Alexander, 2015). Information flow is a crucial component of activities in agro processing firms. The appropriate exchange of information between the processing activities is the key condition for processing raw materials and goods. Each flow of raw materials and goods is also accompanied by the flow of information. Information flow is one of the major flows in any supply chain, a part from product flow, financial flow, value flow and risk flow (Chopra & Meindl, 2013). Efficient and secure information flows are central factors in the performance of decision-making, processes and communications. According to Durugbo, Tiwari and Alcock (2013), information sharing helps in reducing slack, stock-outs, safety stocks, inventory levels and thereby helping to maximize supply chain profitability. A key goal in SCM is to acquire and disseminate knowledge that leads to effective decision-making (Altendorfer-Kaiser, 2014; Phillips, Roehrich & Kapletia, 2021).

The coordinated supply chain activities under a highly integrated information-sharing environment enhance the supply chain performance (Gimenez & Sierra, 2013). Shared information must exhibit certain attributes to create value for the recipient partner. Information sharing will require trade-offs among key information attributes, such as: accuracy, understandability, relevance, timeliness, accessibility, completeness, appropriate amount, reliability, and ease of use (Durugbo, *et al.*, 2013). According to Bardaki, Kourouthanassis and Pramadari (2011), the successful integration of information within an organization is a powerful enabler for reduced costs, increased productivity and improved customer service. In managing information flow, systems must be in place to manage, control and coordinate available information. In achieving performance, information flow comes in handy and information sharing is important to success of supply chain performance (Alexander, 2015). According to Obi, Qiang, Dogbe & Pomegbe (2020), the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance.

Yousefi and Alibabaei (2015) conducted a study focusing specifically on information flow in the context of pharmaceutical supply chain. Key among their findings was

that information systems which constitute of electronic data interchange, electronic fund transfer, extensible markup language, barcode and radio frequency identification, plays a significant role in the pharmaceutical supply chain. They argued that the systems complement each other and are most effective when applied together. The bottom line is that in almost all sectors, the organizational performance is dependent on a variety of supply chain factors for its optimum performance. Information flow management is the management of flow of data in different directions within the supply chain and it is the cornerstone for streamlining business processes (Altendorfer-Kaiser, 2014).

According to Wardaya, Idrus, Hadiwidjoyo and Surachman (2013), information flow is an important element that reflects collaboration within the supply chain management and firm performance. Information flow can be successful when firms impress on information technology use (Obi, Qiang, Dogbe & Pomegbe, 2020). The 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. SCM systems are integrated partnerships among all links in the flow of goods and services to the customer. They are created for the purpose of improving quality, reducing costs and achieving competitive advantage in a world where lean manufacturing and specialization force companies to rely on one another for valuable productive activities (Altendorfer-Kaiser, 2014). All supply chain activities, including planning, sourcing, producing, delivering and providing for returns, are handled collaboratively within an integrated supply chain to ensure the maximum use of shared resources (Anupam & Fedorowicz, 2015; Phillips, Roehrich & Kapletia, 2021).

2.3.6 Performance of Agro Processing Firms

The performance of a firm is a multi-dimensional construct divided into financial and non-financial models (Selvam, Gayathri, Vasanth, Lingaraja & Marxiaoli, 2016). The financial models are productivity, return on assets, profitability, sales growth, cash flow and other financial performance measures. The non-financial models are market share, market position, product quality and customer satisfaction. Thus, there

is no universal unit of analysis for describing or measuring performance, competitiveness and success in firms (Berginc, 2014). Productivity describes various measures of the efficiency of production and expressed as the ratio of an aggregate output to a single input or an aggregate input used in a production process over a specific period. Productivity is a crucial factor in production performance of firms and its growth can help businesses to be profitable (Sickles & Zelenyuk, 2019).

The firms generate financial returns when they invest in assets, otherwise called return on assets (Lee & Roh, 2012). According to Ross, Westerfield and Jaffe (2012), return on assets measures how effectively a firm uses its assets to create profits and how much it generates by the firm from investing any amount in one individual employee. The performance prism is a performance measurement framework that suggests performance measures should include employees, suppliers, alliance partners or intermediaries, stakeholder satisfaction, strategies, processes, capabilities and stakeholder contributions (Agami, *et al.*, 2012; Kurien & Qureshi, 2011). Profitability is ability of a company to use its resources to generate revenues in excess of its expenses. The two key aspects of profitability are revenues and expenses. Profitability, efficiency, solvency and market prospects building blocks for analyzing financial statements and company performance as a whole (Sickles & Zelenyuk, 2019; Zelenyuk, 2018).

Sales growth is a metric that measures the ability of sales team to increase revenue over a fixed period. Sales growth is a strategic indicator used in decision-making, and influences the formulation and execution of business strategy (Sickles & Zelenyuk, 2019). Market share is the percentage of market in terms of units or revenue accounted for by a specific firm. Market share calculated as the product of the firm's sales over the industry's sales during a specified period. It is a key metric in understanding performance relative to the growth of the market as measurement of internal sales growth or decline. Increasing market share is one of the most important objectives of business and a key indicator of market competitiveness, that is, how well a firm is doing against its competitors (Farris, Neil, Phillip & Reibstein, 2010).

Customer satisfaction is a measure of how products and services supplied by a company meet or surpass customer expectation (Pokryshevskaya & Antipov, 2017). It is a key performance indicator within business and is often part of a Balanced Scorecard. It provides a leading indicator of consumer purchase intentions and loyalty. Customer loyalty relates to customer satisfaction as happy customers consistently favor the brands that meet their needs (Kucukosmanoglu & Sensoy, 2010). The issue of performance of firms has been central in strategy research for decades and encompasses most other questions that have been raised in the field, for instance, why firms differ, how they behave, how they choose strategies and how they are managed. Kiriinya, Ngugi, and Mwangangi (2021) used profitability, customer satisfaction and market share to measure performance of pharmaceutical firms in Kenya.

The performance of firms is a measure of effectiveness and desirable outcomes. The firms must engage in this to verify their success at every level of the global supply chain (Wible, Mervis & Wigginton, 2014). In their study, Memia, Ngugi and Odhiambo (2018) adopted financial metrics that included return on assets, profitability and market share in measuring performance of large manufacturing firms in Kenya. Mwangi, Muturi and Shale (2019) used return on assets, return on equity, sales growth and profit margin to measure the performance of manufacturing firms in Kenya. Odalo, Njuguna and Achoki (2016) measured organizational performance in terms of market share using sales per year, level of profitability and return on assets.

Muchiri and Jagongo (2017) used return on assets in measuring performance of the Kenya Meat Commission in Kenya. Dawal, Tahriri, Jen, Case, Tho, Zuhdi and Sakundarini (2015) postulated that financial and cost indicators should be complemented by non-financial measures related to quality, delivery and flexibility and be integrated with management's strategic objectives. Abdullahi, Abubakar and Ahmad (2017) adopted profit margin, return on assets and return on equity ratios as a measure of performance on oil and gas companies in Nigeria. Roberts, Neumann and Cauvin (2017) supported the use of financial metrics to measure performance.

According to Ying-Pin Yeh (2016), competition has changed from being between individual organizations to being between supply chains. As organizations form global alliances, it is essential that they understand how to implement SCG. In today's highly competitive global environment, performance can no longer exclusively be determined by the decisions and actions that occur within a firm as the contribution of all members involved give overall results of SCG. According to Nielsen (2013), measurement of performance of firms depends on both quantitative and qualitative performance indicators. Quantitative and qualitative performance measures provide a tool for organizations to manage progress towards achieving predetermined goals, defining key indicators of organizational performance and customer satisfaction. Measurement is the process of assessing the actual progress made towards achieving the predetermined performance goals. There are two types of performance reports, which are service and cost performance reports.

According to Dekker, Donada, Mothe and Nogatchewsky (2018), performance indicators in agro-food supply chains are efficiency, flexibility, responsiveness and food quality. Efficiency measures how well the resources are utilized and includes several measures such production costs, profit/profitability, return on investment and inventory. Flexibility indicates the degree to which the supply chain can respond to a changing environment and extraordinary customs service requests. It may include customer satisfaction, volume flexibility, delivery flexibility, reduction in number of backorders and lost sales. Responsiveness aims at providing the requested products with a short lead-time. It may include fill rate, product lateness, customer response time, lead-time, shipping errors, and customer complaints. Osoro, Muturi and Ngugi (2016) used right quality, right quantity, right source and timeliness to measure performance of supply chain systems in the petroleum industry in Kenya. Musau, Namusonge and Makokha (2017) used profitability, reliability, responsiveness and flexibility to measure the organizational performance among textile manufacturing firms in Kenya.

2.4 Empirical Review

2.4.1 Contractual Supply Chain Governance and Performance of Agro Processing Firms

Cao and Lumineau, (2015) conducted a qualitative and meta-analytic investigation on the interplay between contractual and relational governance in China firms. They suggested that the effects of contracts depend on the types of provisions included and differentiate between the consequences of control and coordination provisions for better performance. They concluded that both contractual and relational governance improve performance of firms. Lu, Guo, Qian and He, (2015) conducted study on the effectiveness of contractual and relational governances in construction projects in China. They found out that the contractual SCG and relational SCG are important in improving project performance, and these two factors function as complements rather than substitutes. Hong, Zhipeng, Govindan and Zavadskas, (2015) conducted a study on the impact of contractual governance and trust on projects in construction supply chain performance. They concluded that contractual governance has a positive effect on supply chain performance of construction projects, and trust shows some effect on both cooperation and performance.

Addae-Boateng *et al.* (2015) studied contractual governance, relational governance, and firm Performance with the case of Chinese and Ghanaian family and firms. They found out that contractual and relational governance are corporate governance structures used to manage the relationships between parties to a transaction and reduce opportunism. Huber, Fischer, Dibbern and Hirschheim, (2013) conducted study on a process model of complementarity and substitution of contractual and relational governance in information systems outsourcing. They concluded that the relationship between contractual and relational governance oscillates between complementarity and substitution. Mainly three types of contextual events (goal fuzziness, goal conflict, and goal misalignment) trigger those oscillations. Bonatto, Resende and Pontes (2022), researched on SCG as a conceptual model and concluded that there are seven contextual factors that influence the choice of contractual SCG and relational SCG mechanisms in supply chains, namely:

relationship history, environmental uncertainty, perceived risk, perceived justice, asset specificity, power asymmetry and interdependence. They further proposed that contractual SCG and relational SCG are complementary and that the presence of trust (affective and competence-based) moderates the relationship between contextual factors and SCG.

2.4.2 Relational Supply Chain Governance and Performance of Agro Processing Firms

Ying-Pin Yeh, (2016) led an investigation on critical effect of relational SCG on relationship value in strategic supply management on Taiwanese manufacturers. He established that relational SCG is positively associated with relationship quality, relational value and firm performance. In their study, Lu *et al.*, (2015) concluded that contractual and relational governances are effective in improving performance of construction projects in China. Dekker *et al.* (2018) conducted a study on boundary spanner relational behavior and inter-organizational control in supply chain relationships in China manufacturing sector. They stated that boundary spanner relational skills are critical in the successful management of buyer-supplier relationships and helps in avoiding high costs of more formal inter-organizational controls. They summarized that the performance indicators in agro-food supply chains are efficiency, flexibility, responsiveness and food quality.

According to Obi, Qiang, Dogbe and Pomegbe (2020), the relational governance has a positive effect on supply chain performance and at the same time has an indirect effect on supply chain performance through both information sharing and quality of information. Talay and Akdeniz, (2014) studied the effects of duration on the dynamics of trust-building processes in inter-organizational relationships. They pointed out that relational governance mechanisms such as trust enhance transaction-specific investments associated with less monitoring and bargaining that improve performance. Cao and Lumineau, (2015) conducted a qualitative and meta-analytic investigation on the interplay between contractual and relational governance in China firms. They pointed out that both contractual and relational structures assist firms in performance.

Kohtamäki, (2012) conducted a study on relational governance and learning in partnership with the aim to find out the impact of relational governance structures on learning in partnerships. He concluded that certain combinations of relational governance mechanisms like price, hierarchical and social mechanism produce the best learning outcomes in partnerships. Dong *et al.* (2017) studied the relational governance in buyer-supplier relationships among China firms. They stated that relationship management is more flexible than written contracts for governance and without an effective means of relational governance, there will be no communications and relationship. According to Ying-Pin Yeh (2016), relational SCG complements the adaptive limits of contracts by fostering the continuance of exchange and entrusting both parties with mutually agreeable outcomes.

2.4.3 Transactional Supply Chain Governance and Performance of Agro Processing Firms

Dolci, Maçada and Paiva (2017) studied models for understanding the influence of supply chain governance on supply chain performance and identified that supply chain performance comprising transactional supply chain governance aspects has a positive influence on operational and financial supply chain performance. They found out that transactional supply chain governance is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. They concluded that transactional supply chain governance affects supply chain performance, primarily in the operational aspects with regard to global costs and in the financial aspects of investment return.

Murrell, Karalashvili and Francis (2023) researched on transactional-governance structures on new cross-country data and an application to the effect of uncertainty in organizations, and concluded that personal trust, mutual interests, and third parties are important in enforcing agreements to trade under transactional supply chain governance. The further established that the transactional supply chain governance structures encourage and support the initiatives of individual employees to explore new opportunities, to develop new products, and to improve work procedures for the benefit of the organization. Williamson (1986) conducted a study on costly

monitoring, financial intermediation, and equilibrium credit rationing of firms, and found out that the transactional supply chain governance structure accounts for the actual cost of outsourcing production of products or services including transaction costs, contracting costs, coordination costs, and search costs.

2.4.4 Transformational Supply Chain Governance and Performance of Agro Processing Firms

Gupta, Kumar, Kusi-Sarpong, Jabbour and Agyemang (2021) carried a study on enablers to supply chain performance on the basis of digitization technologies and concluded that information technology is one of the enablers that organizations need to focus much in order to transform and improve their SC performance. They further stated that transformational SCG brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms. They further stated that the managers must create an environment in which employees can accept and execute their responsibilities with confidence. The managers must communicate with their employees, imparting the company's vision and listening to what they need to make that vision a reality.

Lu, Wang and Wang (2023) studied on enhancing supply chain resilience with transformational supply chain governance and finance as the enabling role of digital technology adoption, and found out that many companies have invested in greater supply chain digitization over the years to cope up with supply chain disruptions and to ensure performance. Pupkin (2023) noted transformational governance model seeks to address current challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making. The researcher concluded that transformational governance is the process of creating, sustaining and enhancing mutual relationship between management and employees. Papadopoulos, Gunasekaran, Dubey and Wamba, (2017) conducted a study on big data and analytics in operations and supply chain management in managerial aspects

and practical challenges. They found out that transformational SCG faces many challenges at the implementation stages as resistance to change, integration of new technologies, data integration and analytics, disruption to existing processes, cost, talent and skills.

Aben, van der Valk, Roehrich and Selviaridis (2021) carried out research on managing information asymmetry in public–private relationships undergoing a digital transformation. They found out that businesses of all sizes need to digitize their supply chains and also rethink the roles of their employees and processes to ensure that products will be available and will arrive at their intended destinations in time to meet customer demand. They further stated that there is need for comprehensive overhaul and modernization of a business’s supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Dubey, Gunasekaran, Childe, Papadopoulos and Fosso-Wamba, (2017) found out that transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms.

2.5 Critique of the Existing Literature

Dolci, Maçada and Paiva (2017) in their study titled models for understanding the influence of SCG on supply chain performance (SCP) identified that SCG, comprising contractual, relational and transactional aspects, has a positive influence on operational and financial SCP. The study focused on large companies that possessed broad and complex supply chain in Brazil. They found out that SCG is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. It was established that SCG affects SCP, primarily in the operational aspects with regard to global costs and in the financial aspects of investment return. They concluded that SCG is a topic that has been widely studied in recent years for analysing inter-organizational relations as a multi-dimensional phenomenon embedded in the company’s structures and processes. However, few studies have attempted to understand the effects of SCG on

supply chain performance. Whereas, this study used primary data for valid and reliable findings regarding performance of agro processing in Kenya since supply chain governance is a relatively recent concept.

Bonatto, Resende and Pontes (2022) studied supply chain governance based on a conceptual and relational model with the aim of clarifying ambiguous results from previous research on the relationship between contextual factors, trust and SCG. The study conducted a thematic analysis in 60 articles to address the contextual factors, governance structures and trust approaches raised in previous research. The thematic analysis revealed that seven contextual factors influence the choice of contractual and relational mechanisms in supply chains. The contextual factors are relationship history, environmental uncertainty, perceived risk, perceived justice, asset specificity, power asymmetry and interdependence. The findings explained the ambiguous results of past research by proposing that contractual and relational governance are complementary and that the presence of trust (affective and competence-based) moderates the relationship between contextual factors and SCG. Their study used existing literature for analysis and hence was limited since the SCG is a relatively new concept. This study used expert opinions to establish the influence of SCG on performance of agro processing firms in Kenya.

Lu, Wang, and Wang (2023) researched on enhancing supply chain resilience with supply chain governance and finance together with the enabling role of digital technology adoption. The study aimed at exploring the impact of SCG on supply chain resilience (SCR) in China, as well as the mediating role of supply chain finance (SCF) and the moderating role of digital technology adoption. They established that both relational governance and contractual governance significantly enhance SCR and SCF. In addition, SCF plays a mediating role in the relationship between SCG and SCR. The study also found out that digital technology adoption has a positive moderating effect on the relationship between SCG and SCF. The study concentrated only on the impact of SCG on SCR and SCF ignoring the effect of SCG on performance of agro processing firms.

Lu, Jiang and Wang (2024) in their study titled effects of supply chain governance on supply chain resilience based on information processing theory, established that SCG, which includes relational governance and contractual governance positively impacts SCR. The study also examined the mediating role of information processing capability and the moderating role of digital technology deployment. The study used 288 questionnaires to collect data from the Chinese manufacturing industry, and hierarchical regression was used to empirically test the proposed model. The study also revealed that information processing capability plays a mediating role between SCG and SCR. It further revealed that the depth of digital technology deployment positively moderates the effects of both relational governance and contractual governance on information processing capability. The study offers a novel perspective that helps to understand the importance of the supply chain-wide information acquired by SCG in respect of improving SCR. However, the study was only restricted to moderating effects of digital technology on SCG and information processing capability, and ignored the influence of SCG, which includes relational governance and contractual governance on performance of agro processing firms.

In his study titled SCG for social sustainability of the ready-made garment industry in Bangladesh, Farhad (2019) concluded that SCG improve performance. The purpose of the study was to understand how SCG mechanisms and governance structures improve social sustainability performance when stakeholders are engaged. The study focused on the challenges faced by the multinational corporations to ensure social sustainability. The study identified four main governance systems, namely, market-based, hierarchical control-based, collaborative multi-stakeholder-based and relational cross-sectoral-based. The study pointed out that governance structure provides the platform for practicing a set of SCG mechanisms. The study concluded that the framework of SCG for social sustainability performance illustrates that there is no single expected performance of governance, as each governance system can lead to different outcomes. The study established that suppliers' development through extensive training and education by the buyers may not necessarily improve social compliance performance. Also, that suppliers' willingness and involvement are necessary for improving workers' health condition and ensuring workers' rights. The study concentrated on how SCG may increase

worker empowerment, wellbeing and community development to improve social sustainability performance, and not influence of SCG on performance of agro processing firms.

Hong, Zhipeng, Govindan and Zavadskas (2015) researched on the impact of contractual SCG and trust on engineering, procurement and construction projects in construction supply chain performance in China. The findings of the study showed that contractual SCG had a positive effect on the projects in construction supply chain performance, but the effect on cooperative behavior was not significant. The study further indicated that trust showed some influence both on cooperation and performance, while cooperation had a positive significant effect on the performance. The different dimension of trust had different effects on cooperation and performance, while affect-based trust had a positive significant effect on cooperation and performance. The effect of cognition-based trust on performance was not significant, and it only had a positive effect on cooperation. The system-based trust had no effect on cooperation and performance. The study was restricted to the impact of contractual SCG and trust on projects in construction supply chain performance and ignored the influence of SCG on performance of other sectors.

Gyau and Spiller (2012) investigated the relationship between the types of supply chain governance structure and the perceived relationship performance of Ghanaian fresh fruit and vegetable exporters concerning their business with European importers. They collected data from 101 exporters in Ghana and analysed. The study found out that relationship performance is a multi dimensional construct with economic and behavioral relationships as the two main dimensions. The study revealed that whereas the economic relationship performance is influenced by the type of governance structure used, the behavioral relationship performance is not. Thus, the economic dimension of the relationship improves as the firms adopt a more coordinated type of governance structure. The study concluded that both the exporters and the importers can improve their economic performance and enhance efficiency in the supply chain if they adopt a more coordinated supply chain governance structure type if there are appropriate mechanisms for equitable distribution of benefits. The study was based on the relationship between the types of

SCG structure that may influence the economic relationship performance and the behavioral relationship performance.

Ashenbaum, Maltz, Ellram and Barratt (2009) in their study titled organizational alignment and supply chain governance structure found out that organizational alignment and SCG structure promote better internal supply chain integration within the firm, and allow for an assessment of the SCG structure of the firm's supply chain. The study focused only on two areas of organizational alignment and SCG structure. The organizational alignment as a reflective scale measuring the extent to which upper management attempts to foster integration between internal supply chain functions. Also, the SCG structure as a formative index, and as a first attempt at developing a measurement instrument to assess the SCG structure along multiple dimensions. The study was restricted to organizational alignment and supply chain governance structure in promoting better internal supply chain integration within the firm, but not the influence of SCG on firms.

Ghosh and Fedorowicz (2008) studied the role of trust in supply chain governance. This study provides a framework for the role of SCG mechanisms in information sharing among supply chain members, and illustrates the importance of trust in governing interorganizational relationships is emphasized. The study established that trust, bargaining power, and contract are three key constructs supporting the governance of information sharing and material flow coordination in supply chains. The identified SCG issues are key factors in the supply chain business model of the retail distribution industry in which collaborative planning, forecasting and replenishment is used to exchange supply and demand forecasts. They concluded that the role of SCG mechanisms in information sharing coordination will help chain members to realign business relationships and contribute to improved overall operational performance of the chain. The limitation of the study is that the proposed framework was illustrated with a single case of the retail distribution industry instead testing it empirically for supply chains across different industries.

2.6 Research Gaps

The empirical review had evidence that research in the area of SCG have been done widely and embedded in the company's structures and processes (Dolci, Maçada & Paiva, 2017), but not in a comprehensive approach in Kenya. Literature review available indicated that most of studies on effect of SCG on performance of firms are in developed economies like European Union, United states and advanced Asian countries. For example; Anupam and Fedorowicz, (2015) studied the role of trust in supply chain governance between suppliers and business organizations in India. Cao and Lumineau, (2015) studied the interplay between contractual and relational governance in China firms. Crisan, *et al.*, (2011) conducted a study on the relation between supply-chain performance and SCG practices in Romania firms. Jiguang and Bing, (2018) conducted study on sustainable collaborative governance in supply chain in China firms.

Similarly, Legacy, Curtis and Sturup, (2012) studied a good governance model for the delivery of contemporary transport policy and practice in Australia firms. Li, *et al.*, (2014) studied governance of sustainable supply chains in the fast fashion industry in China. Lu *et al.*, (2015) studied the effectiveness of contractual and relational governance in construction projects in China. Melander and Lakemond, (2015) studied the roles of transactional and relational governance in achieving limited supplier involvement and establishing high levels of collaboration in Sweden. Zhang and Aramyan, (2014) conducted a study on conceptual framework of supply chain governance to agri-food chains in China. Eltantawy, (2014) conducted study on supply management governance role in supply chain risk management and sustainability of firms in USA.

The examples of studies on the effect of supply chain governance and its conceptions on performance of organizations in Africa are; Gyau and Spiller, (2012) studied the impact of SCG structures on the inter-firm relationship performance in agribusiness in Ghana. Ponte and Sturgeon, (2014) explained importance of supply chain governance in global value chains with a modular theory-building effort for the Southern African poultry value chain. Nimpano, Shalle and Mulyungi, (2021)

studied the effect of green supply chain governance adoption on the performance of agri-manufacturing firms in Rwanda. Aben, van der Valk, Roehrich and Selviaridis, (2021) pointed out the importance of managing information asymmetry in public–private relationships undergoing a digital transformation with regard to contractual and relational supply chain governance in Netherlands. In their study, Lu, Jiang and Wang, (2024) concluded that information processing capability plays a mediating role between SCG and supply chain resilience (SCR) in the Chinese manufacturing industry.

There are some studies on effect of supply chain governance on performance of various organizations in Kenya. For example, Kingoo and Chirchir, (2013) studied supply chain governance and organizational performance among parastatals in Kenya. While other scholars have done research on the performance of the various sub-sectors of agro processing firms in Kenya. For example; Ndicu *et al.* (2015) studied efficiency analysis of agro processing industry in Kenya. Kyengo, Muathe and Kinyua, (2019) studied the effect of marketing capability and firm performance of food processing firms in Nairobi City County, Kenya. Bor, Ngugi and Odhiambo, (2021) conducted study on green supply chain management practices and performance of food and beverage processing sector in Kenya. Njuguna and Wanjohi, (2021) conducted a study on the effect of business process re-engineering on performance of agro-processing firms in Nairobi City County, Kenya.

The studies done locally focused on other supply chain management practices and not supply chain governance. This formed the gap for which this study sought to fill by studying the effect of supply chain governance and its conceptions (transactional SCG, relational SCG, transactional SCG and transformational SCG) with information flow as the moderating variable on performance of agro processing firms in Kenya. Furthermore, few studies have attempted to understand the effects of SCG on performance of agro processing firms. The concept of SCG is important in this study with an intension of solving performance issues and supply chain problems associated with the agro processing firms in Kenya.

2.7 Summary

The chapter has reviewed existing literature on supply chain governance and performance of agro processing firms. The literatures reviewed suggested that any business organization could improve in the overall performance if they plan and implement appropriate SCG systems. The concepts have been examined in the light of existing theories that include Theory of Constraints, Game Theory, Transaction Cost Theory, Agency Theory and Theory of Performance. This study sought to establish whether contractual SCG, relational SCG, transactional SCG and transformational SCG influence the performance of agro processing firms, and whether the relationship was moderated by information flow. The variables have been discussed in detail and empirical review covering research undertaken is also covered in this chapter. The literature and empirical review indicated that studies on effect of SCG on performance of firms cover many parts of the world. The critique of the previous studies has been conducted lead into the research gap that the present study sought to fill.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed research design, research philosophy, target population, sampling frame, sample and sampling technique, research instrument, data collection procedure, pilot testing, data analysis and presentation, and scientific research tests of this study. Research methodology refers to the process of collecting information for making business decisions. Methodology includes publication research, interviews, surveys and other research techniques, and could include both present and historical information (Anderson *et al.*, 2015). Methodology presents the overall framework or roadmap that achieves research results through data collection and analysis. According to Creswell and Creswell (2017), a central part of research is to develop an efficient research strategy.

3.2 Research Design

Research design is the set of methods and procedures used in collecting and analyzing measures of the variables specified in the research problem (Creswell & Dally, 2015). Research design is a structure or plan for one's research (Leavy, 2017). A good research design has a clearly defined purpose and has consistency between the research questions or hypotheses and the proposed research method (Moser & Korstjens, 2018). This study adopted the survey research design. The survey research refers to a particular type of research design where the primary method of data collection is by survey (Turner, Cardinal & Burton, 2017). The specific techniques of survey research design are questionnaires and interviews (Creswell & Creswell, 2017). The survey research design is appropriate where large population geographically spread is involved which was the case in this study (Jarret, 2016). The design allowed collection of data for dependent and independent variables by interviewing and use of questionnaire for this study (Silverman, 2019).

The survey research design enabled the study to apply both quantitative and qualitative research approaches that reinforce each other. Quantitative approach strives for precision by majoring on items that can be counted into predetermined categories and subjected to statistical analysis (Moser & Korstjens, 2018). The study used this approach because the data collected by means of questionnaire was quantitative and was analyzed using statistics. Qualitative approach enabled collection of data in the form of words rather than numbers. It presented verbal explanations instead of numerical and helped in obtaining more in-depth information that would be otherwise intricate to convey quantitatively (Miksza & Elpus, 2018). According to Anderson *et al.* (2015), survey research design is relatively inexpensive, useful in describing the characteristics of a large population, and allows respondents to answer with more candid and valid answers. The survey design uses modes like online surveys, email surveys, social media surveys, paper surveys, mobile surveys, telephone surveys, and face-to-face interview surveys (Sekaran, 2015).

3.2.1 Research Philosophy

According to Saunders and Thornhill (2014), research philosophy is a paradigm that explains the researcher's perspective or how the researchers view the world and the assumptions they make as they gather, analyze and interpret data. Research philosophy is a belief about the ways of collecting data, analyzing data and using data about a phenomenon (Matta, 2015). This study was guided by positivism research philosophy, which is part of epistemological viewpoint. Positivism research philosophy reflects the belief that reality is stable (Babbie, 2013). Positivism is a philosophical theory stating that certain positive knowledge is natural phenomena and their properties and relations (Greene, 2012). The positivist philosophy was used in this study because it puts emphasis on highly structured methodology to facilitate replication on quantifiable observations that can be analyzed statistically. Positivism is characterized by a belief in theory before research and statistical justification of conclusions from empirically testable hypothesis, the core tenets of social science (Creswell & Poth, 2017).

According to Jarrett (2016), the philosophical approaches of natural scientist observe positivism as the work of natural scientist on observable social entity. The positivist researcher follows highly structured methodology in order to facilitate the hypothesis. Positivism works on quantifiable observations and statistical analysis (Topal, 2014). Positivists' belief is that hypothesis developed from existing theories of measuring observable social realities, and positivism derived from natural sciences. Halfpenny (2015) asserts that positivism research philosophy can be used to investigate what truly happens in organizations through scientific measurement of people and system behaviors hence this research philosophy can be used to investigate the effect of supply chain governance on performance of the agro processing firms in Kenya.

3.3 Target Population

Population is a complete set of individual's cases, objects or events with some common observable characteristics (Sekaran, 2015). Target population refers to a large and scattered number of subjects over a wide geographical area (Kothari & Garg, 2014). The target population should have some observable characteristics, from which the researcher intends to generalize the results of the study (Manna & Mete, 2021). The target population of this study was 344 agro processing firms in Kenya that were members of KAM as listed in the Kenya Association of Manufacturers and Exporters Directory (2019). The 344 agro processing firms were grouped into twelve subsectors as shown in Table 3.1 and Appendix IV. These firms were the unit of analysis and each firm filled one questionnaire. This study targeted supply chain managers from each firm as the units of observation, but questionnaires from some firms were filled by production managers and administration (finance, operations, and human resource) managers as the units of observation. The unit of analysis refers to the main parameter that a researcher is investigating in a study. A unit of observation is the item or items that a researcher observes, measure, or collect while trying to learn something about the unit of analysis (Anderson, *et al.*, 2015).

Table 3.1: Target Population

Sub-Sector	No. of Firms
Alcoholic Beverages and Spirits	24
Bakers and Millers: Grain Millers	59
Cocoa, Chocolate and Sugar Confectionery	38
Dairy Products	16
Fresh Produce	14
Juices / Waters / Carbonated Soft Drinks	40
Leather & Footwear	10
Slaughtering, Preparation & Preservation of Meat	12
Textile and Apparels	62
Timber, Wood and Furniture	26
Tobacco	3
Vegetable Oils	40
Total	344

n-344

Source: Kenya Association of Manufacturers and Exporters Directory of 2019

3.4 Sampling Frame

According to Creswell and Creswell (2017), a sampling frame is a list or other device used to define a researcher's population of interest. Sampling frame refers to a list of sampling units of the population for a study. The sampling frame defines a set of elements from which a researcher can select a sample of the target population (Sekaran, 2015). It is a list of all those within a population that can be sampled, and may include individuals, households or institutions (Mooney & Garber, 2019). The supply chain managers, production managers, and administration (finance, operations, and human resource) managers who deal with the day-to-day activities of the firms were the main participants. The list for this study was the 344 agro processing firms in Kenya that are members of KAM and listed in the Kenya Association of Manufacturers and Exporters Directory (2019).

3.5 Sample and Sampling Technique

According to Jarrett (2016), sampling is a procedure or technique of selecting some elements from the population to be representatives of the whole group. Sampling is the process of obtaining information about an entire population by examining only a part of it or sample size (Mooney & Garber, 2019). The purpose of sampling is to obtain a comprehension of some features of the entire population in accordance with the characteristics of the sample. According to Kalton (2020), sample size refers to the selected number of cases, members or events from the accessible population. The study adopted census survey and the required data for this study was collected from all the 344 agro processing firms that forms the target population of this study. A census is a survey conducted on the full set of observation objects belonging to a given population or universe. According to Manna and Mete (2021), census method is a complete enumeration of the entire population used when it is reasonable to include the entire population and whereby one does not need to use a sample.

3.6 Research Instrument

Research instrument is a tool the researcher uses when collecting data from the sample selected or the entire target population. Researcher should select the most appropriate instrument to the respondents, and can use one or a combination of instruments (Leavy, 2017). The researcher should give details on what the respondents should do. The quality of a research study depends on the accuracy of the data collection instrument. The instruments used to collect data must yield data the researcher can use accurately to answer study questions (Shields, 2013). The choice of the research instrument should be in accordance with the kind of data the researcher needs, the design used, the simplicity of application, the researcher's preference and the nature of the intended questions (Bell, Bryman & Harley, 2018).

This study used questionnaires to collect primary data from the respondents. The questionnaires contained closed-ended and open-ended questions that captured the various variables of the study. According to Truijens, Van Nieuwenhove, De Smet, Desmet and Meganck (2021), using a close-ended questionnaire limits the respondents by providing acceptable answers, limiting serious thinking on the part of

the respondents. This makes respondents to choose the easiest alternative and as it provides fewer opportunities for self-expression. The open-ended questionnaires are applied due to their ability to let respondents exercise freedom to express their views or opinions and to make prudent decisions (Robinson & Leonard, 2018). Questionnaires provide easier method of collecting data because they are economical and convenient to administer in terms of time and cost, information could be obtained from a large sample, no opportunity for bias since it was presented in paper form and confidentiality was upheld (Ebert, Huibers, Christensen, & Christensen, 2018).

3.7 Data Collection Procedure

According to Creswell and Dally (2015), data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. Data collection procedures refer to methods of sending the instruments to the respondents to respond to the items (Sekaran, 2015). According to Leavy, (2017), questionnaires can be administered in person, mailed to the respondents or distributed electronically. The researcher obtained a list of the agro processing firms from KAM, an introduction letter from the university and a research permit from National Commission for Science Technology and Innovation (NACOSTI) to collect data from the agro processing firms in Kenya.

The researcher involved research assistants who were trained on the procedure of administration of questionnaires and in interpretations of responses from respondents. The research assistants also assisted the researcher in piloting and modifying the questionnaires in order to understand fully the purposes and methods of data collection. The questionnaires were hand delivered to the respondents using drop and pick approach. Each firm was given one questionnaire. The respondents were given three weeks to fill the questionnaires, and then filled questionnaires collected. The period of collection could be extended in cases where the respondents failed to return the filled questionnaires at the agreed time.

Direct presentation of questionnaires to respondents is considered socially responsible, as respondents prefer face-to-face contact in order to avoid suspicion. The responses were then inscribed on the questionnaire. The questions were both open-ended and close-ended where, the respondents used a five-level differential scale to choose and provide a number of alternative answers. The respondents were required to give their independent view on influence of supply chain governance on performance of agro processing firms in Kenya. Some questionnaires in this study were also e-mailed to the respondents. The main consideration was to make sure that any information collected is consistent with the research ethics and complies with freedom of information and privacy protection legislation (Greene, 2012).

3.8 Pilot Testing

Pilot testing is conducted to ensure that the research instruments have capability to collect all the information and that all the respondents understand all questions in the same way (Creswell & Creswell, 2017). According to Sekaran (2015), the questionnaire is constructed and tried out in the field in order to remove any ambiguity and other deficiencies in the questionnaire. The two factors that effect research instruments are reliability and validity (Anderson, *et al.*, 2015). Thus, it is necessary to conduct the reliability test and validity test of the data collection instruments. Questionnaires were administered to a few firms with an intention of pre-testing the questions of the questionnaire. Pilot study helped to test the feasibility of the study techniques in order to perfect the questionnaire concepts and wording. Pilot study was administered on 34 agro processing firms being 10% of the sample size, which is in agreement with Mugenda and Mugenda (2003) who asserted that the pre-test number is expected to be between 1% to 10% of the target population

3.8.1 Reliability of the Research Instrument

The term reliability refers to the consistency with which a measuring instrument yields a certain result when the entity measured has not changed (Park, 2018). Reliability is the characteristic of a set of test scores that relates to the amount of random error from the measurement process embedded in the scores. The highly reliable scores are accurate, reproducible and consistent from one testing occasion to

another (Heale & Twycross, 2015). There are theories of testing reliability to estimate the effects of inconsistency on the accuracy of measurement. The basic starting point for almost all theories of test reliability is the idea that test scores reflect the effect of two sorts of factors (Eisinga, Te Grotenhuis, & Pelzer, 2012).

This study used the most common internal consistency measure known as Cronbach's alpha (α) to measure the reliability. It indicates the extent to which a set of test items can measure a single latent variable (Cronbach, 1951). Cronbach's alpha is a reliability coefficient that indicates how well items in a set are positively correlated to one another. The Cronbach's alpha coefficient should range between 0 and 1. Higher alpha coefficient values means that scales are more reliable. The Cronbach's alpha coefficient of at least 0.7 or above is commonly acceptable and 0.8 or higher scales indicate good reliability (Taber, 2018). The alpha coefficients below 0.7 for a variable necessitated the need to drop the variable and second pilot test undertaken. Cronbach's alpha is a general form of the Kuder-Richardson (K-R) 20 formulas used to assess internal consistency of an instrument based on split-half reliabilities of data from all possible halves of the instrument. It reduces time required to compute a reliability coefficient in other methods (Sarstedt & Mooi, 2019).

3.8.2 Validity of the Research Instrument

Validity refers to the degree in which a test or other measuring device is truly measuring what we intended it to measure (Creswell & Daly, 2015). Test validity is the extent to which a test accurately measures the situation. According to Leavy (2017), validity is the degree to which the empirical measure or several measures of the concept, accurately measure the concept. It refers to the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests. Statistical analysis helps determine whether the differences between the various results are either large enough to be a problem or are acceptably small (Sekaran, 2015). The validity of the questionnaire was determined using various validity tests that included construct validity, content validity and face validity to ensure that what is supposed to be measured and performed is achieved with minimal deviation.

The construct validity is concerned with how well a set of indicators represent or reflect a concept that is not directly measurable. There are two main types of construct validity namely convergent validity and discriminant validity (Cobern & AJ, 2020). The convergent validity indicates the extent to which a measure corresponds to measures of related constructs, while the discriminant validity points out the extent to which a measure is unrelated or negatively related to measures of distinct constructs. In this study, construct validity was achieved through limiting the questions to conceptualization of the variables and ensuring that the indicators of every variable fell within the same construct to ensure that each measure adequately assess the construct it was purported to assess. Construct validity is the appropriateness of inferences made on the basis of observations or measurements (often test scores), specifically whether a test can reasonably be considered to reflect the intended construct (Cobern & Aj, 2020). The construct validation is the accumulation of evidence to support the interpretation of what a measure reflects. Construct validity is essential to the perceived overall validity of the test. The purpose construct validity was to find out if the test would measure the concept that was intended to measure (Wieland, Durach, Kembro & Treiblmaier, 2017).

The study dealt with different groups of experts in the supply chain management and issued them with the questionnaires. The experts who were conversant with the construct validity were expected to assess if the questionnaires could help in determining the influence of supply chain governance on performance of agro processing firms in Kenya. The coefficient of the data gathered from the pilot study was computed using Statistical Package for Social Sciences (SPSS) version 25. A coefficient of above 0.5 was obtained and this upheld the validity of the data collection instrument (Mohajan, 2017). The recommendations from the supply chain management experts and the pilot study respondents were used to improve on data collection instruments.

The content validity refers to the extent to which a measure represents all facets of a given construct. It is the extent to which a measuring instrument provides adequate coverage of the topic under study. The questionnaires were formulated and operationalized as per the study variables to warrant sufficiency and

representativeness of the items in each variable for purpose and objectives of the study. Content validity is concerned with the tests whether items are a representative sample of all items within the content domain of interest of a particular construct. The content validity is improved through proper assessment of the relevance of the content used in the questionnaire (Heale & Twycross, 2015). An element of subjectivity existed in relation to determine content validity, which requires a degree of agreement about what a particular personality trait represents. A disagreement about a personality trait will prevent the gain of a high content validity. It tests the full representation of what it aims to measure (Pascoe, 2022). A research instrument can only achieve content validity if it goes through a rational analysis by experts who are familiar with the academic scope of study. On scrutiny, content was justified with evidence from literature, and various suggestions for correction were made and the ultimate research instrument was produced.

Face validity is the extent to which a test is subjectively viewed as covering the concept it purports to measure (Wieland *et al.*, 2017). It refers to the transparency or relevance of a test as it appears to test participants. A test can be said to have face validity if it looks like it is going to measure what it is supposed to measure. It is often contrasted with construct validity and content validity. Face validity is the judgment made based on scientific approach on whether the indicators in use measure the required construct (Sackett, Lievens, Berry & Landers, 2007). The evaluation of all items was performed to determine if they corresponded with the given conceptual domain of supply chain chain governance and performance of agro processing firms. This was proved with some modifications that were implemented. The face validity establishes if the content of the test appears to be suitable to its aims (Gravetter & Forzano, 2012).

3.9 Data Analysis and Presentation

Data analysis is the process of summarizing the data collected with reference to the objectives of the research (Moser & Korstjens, 2018). The purpose was to give meaning and to meet the purpose for study. According to Denis (2020), data analysis requires the use of logic to analyze the data collected in order to define specific

patterns and summarize the relevant details contained in the sample. The entry of data transforms information obtained through primary or secondary methods into a tool for viewing and processing. The statistic measures can be classified into two groups of descriptive statistics and inferential statistics: analysis of variance, correlation analysis, coefficient analysis and multiple regression analysis (Gunst & Mason, 2018). This study adopted both descriptive statistics and inferential statistics to analyse data.

In the data analysis, data must be organized, analyzed, and interpreted through statistical measures. The stages of data processing include editing, coding, classification and tabulation. Editing is the process of eliminating errors and omissions from questionnaires or interviews schedules (Sarstedt & Mooi, 2019). Coding is the process of summarizing the response categories by certain symbols to carry out the subsequent operation of data analysis purpose. Classification is the process of arranging data in groups or classes of common characteristics, that is, the data that bear the same characteristics placed in one class. Tabulation is the presentation of the results of data analysis in a systematic way, and it involves the summary of the results on the population (Denis, 2018). The collected data was analyzed and the information codified and entered into a spreadsheet and analyzed using frequencies and percentages obtained from SPSS version 25.

The data was presented using statistical techniques that included frequency distribution for grouped and ungrouped data, measures of central tendency such as mean and mode to present characteristics that determine performance of agro processing firms and measures of dispersion such as variance, standard deviation and coefficient of variability. The findings were presented using tables and figures. Trend analysis was used to spot a pattern on the sub-constructs of performance of agro processing firms for the period of 2015-2019. Trend analysis is a technique for extracting an underlying pattern, which done through qualitative analysis. Tables and figures were used to present the analysed data.

3.10 Descriptive Statistics Analysis

According to (Sarstedt & Mooi, 2019), descriptive data analysis is used in the description of basic features of the data in a study. It avails simple summaries about the sample and the measures. Descriptive statistics refers to a branch of statistics that involves summarizing, organizing, and presenting data meaningfully and concisely. It focuses on describing and analyzing main features and characteristics of a dataset without making any generalizations or inferences to a larger population (Hoeks, Kardys, Lenzen, van Domburg, & Boersma, 2013). Descriptive statistics consists of three basic categories of measures as measures of central tendency, measures of variability (or spread), and frequency distribution. Descriptive techniques used for this study included constructing tables, means and quantiles, measures of dispersion such as variance or standard deviation, and cross-tabulations. The techniques were used to examine many disparate hypotheses, which are often about observed differences across subgroups (Creswell, & Creswell, 2017).

3.10.1 Quantitative Data

Quantitative data are data represented numerically that can be counted, measured, or given a numerical value (Doldor, Silvester & Atewologu, 2017). Quantitative data analysis is the process of making sense of numerical data through mathematical calculations and statistical tests. It helps in identifying patterns, relationships, and trends to make better decisions (Bryman, 2012). Quantitative data was analyzed using descriptive statistics, measures of central tendency, measures of dispersion and inferential statistics.

The statistical package for the social sciences (SPSS) software version 25 was used as a statistical tool for analysis. Linear regression analysis revealed the correlation and strength of the relationship between both independent and dependent variables and the effect of the moderating variable on each relationship. Multiple regression analysis was conducted to test the overall effect on the study model (Denis, 2018). Analysis of Variance (ANOVA) also sought to test the goodness of fit of the regression models and finally to test the hypothesis of the multiple regression models (Siegel, 2016).

3.10.2 Qualitative Data

Qualitative data is information that cannot be counted, measured or easily expressed using numbers. It is collected from text, audio and images and shared through data visualization tools, such as word clouds, timelines, graph databases, concept maps and infographics (Silver & Lewins, 2014). Qualitative data collected from was analyzed qualitatively, and data frequency distribution and cross tabulation was used in describing the situation as is in the agro processing firms in Kenya. The data was coded and analyzed simultaneously as collected. Through thematic analysis, a list of key ideas and themes for each variable was generated.

This guided the nature of integration needed for both qualitative and quantitative data collected (Michelle & Lara, 2020). The data obtained was first transcribed before generation of initial codes in a theory driven manner. The third step was involved to discover recurrent themes amongst the codes and then a review of the themes was made to assess the evidence associated with respective themes (Nyile, Shale & Osoro, 2022). The views and ideas that recurred often were noted. The recurrent themes selected were finally defined and named in describing and explaining the situation as is in the agro processing firms and ultimately reported in narration form (Bredal, Stefansen & Bjørnholt, 2022).

3.11 Diagnostic Tests

The aim of statistical diagnostic testing is to determine whether or not the researcher can continue to fit the model of regression analysis to the study's findings (Gunst & Mason, 2018). A diagnostic test is any test used to determine the nature or severity of a particular condition. Diagnostic tests were conducted in order to identify specific areas of weakness and strength in order to determine a condition. In order to have a regression model and estimates that mean something, researcher should be sure that the assumptions are reasonable and that the sample data appear from a population that meets the assumption (Sekaran, 2015). The normality test, linearity test and heteroscedasticity test help in checking for relationship between the independent and dependent variables (Lewis-Beck & Lewis-Beck, 2015). The tests for this study

were normality test, linearity test, heteroscedasticity test, multicollinearity test, confirmatory factor analysis, autocorrelation test and homoscedasticity test.

3.11.1 Normality Test

In statistics, normality tests are used to determine if a data set is well modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed (Perez & Kibria, 2020). The tests are a form of model selection and interpreted in several ways depending on one's interpretations of probability. In frequentist statistics, statistical hypothesis testing, and data tested against the null hypothesis that is normally distributed (Ghasemi & Zahediasl, 2012). In descriptive statistics terms, one measures a goodness of fit of a normal model to the data (if the fit is poor then the data are not well modeled in that respect by a normal distribution, without making a judgment on any underlying variable). According to Lamb (2014), when a p-value >0.05 it implies that the variable is sufficiently and normally distributed on a significance level of 5% and is fit for further statistical analysis and will not result in inflated statistics and underestimated standard errors.

Normality test is performed for outliers within the constructs and drop the ones identified. Outliers are observations showing characteristics or values that are markedly different from the majority of cases in a data set and should be dropped (Sarstedt & Mooi, 2019). This is because they distort the true relationship between variables, by either creating a correlation that should not exist or suppressing a correlation that should exist. To test for outliers, Mahalanobis d-squared was used to test multivariate on the dependent and independent variables.

After dropping the outliers, Kolmogorov-Smirnov test was done to test for normality of variables whereby if p-value is greater or equal to 0.05 the data is normal and if p-value is less than or equal to 0.05 then the distribution is not normally distributed and will be rejected on a significance level of 5 percent (Mishra, Luo, Hazen, Hassini, & Foropon, 2019). When a p-value > 0.05 it implies that the variable is sufficiently normally distributed on a significance level of 5% and is fit

for further statistical analysis and will not result in inflated statistics and underestimated standard errors (Se Yoon, 2021).

3.11.2 Homoscedasticity Test

Homoscedasticity refers to constancy of variance. Homoscedasticity describes a situation in which the error term is the same across all values of the independent variables (Leavy, 2017). For any linear regression analysis, the error terms are assumed to be the same across all values of the independent variables. This was achieved through plotting a residual scatter plot for predicted scores and standardized residual values also known as errors of prediction. This assumption is met if the scores are randomly scattered about a horizontal line. According to the findings in figure the scores appeared to be randomly scattered. This indicated that the homoscedasticity assumption was not violated.

3.11.3 Multicollinearity Test

According to Sekaran (2015), multicollinearity is a phenomenon in which one predictor variable in a multiple regression model can be linearly predicted from the others with a substantial degree of accuracy. Multicollinearity generally occurs when there are high correlations between two or more predictor variables, and one predictor variable predicts the other (Park, 2018). In this situation, the coefficient estimates of the multiple regressions may change erratically in response to small changes in the model or the data (Perez, & Kibria, 2020). Multicollinearity does not reduce the predictive power or reliability of the model as a whole, at least within the sample data set, and it only affects calculations regarding individual predictors (Creswell & Dally (2015).

The multivariate regression model with collinear predictors can indicate how well the entire bundle of predictors predicts the outcome variable, but it may not give valid results about individual predictor or about which predictors are redundant with respect to others (Cantos. 2019). In the case of perfect multicollinearity, (one independent variable is an exact linear combination of others), the design matrix has less than full rank and the moment matrix cannot be inverted. Under these

circumstances, for a general linear model, the ordinary least-squares estimator does not exist (Anderson, *et al.*, 2015). Multicollinearity was tested to establish the possibility of the predictor variables having some explanatory power over each other.

3.11.4 Linearity Test

Linearity is the property of a mathematical relationship or function represented graphically as a straight line (Park, 2018). The measure of linearity is an important part of the evaluation method. The results of a linearity experiment fit to a straight line and judged either by visual evaluation, which is subjective, or by the lack-of-fit test. The Pearson's correlation coefficient tests the linear relationship of the independent variables to the dependent variable. It also tests the linear relationship between the supply chain performance and each of the proposed hypothesized explanatory variables (Mahmood, Qadeer & Ahmed, 2014). Correlation coefficient shows the strength as well as the direction of the linear relationship. A negative correlation indicates an inverse relationship where an increase in one variable causes a decrease in the other, while a positive correlation indicates a direct effect where an increase in one variable causes an increase in the other variable (Cantos, 2019).

3.11.5 Heteroscedasticity Test

According to Sekaran (2015), one of the problems commonly encountered in cross-sectional data is heteroscedasticity (unequal variance) in the error term. There are various reasons for heteroscedasticity, such as the presence of outliers in the data, or incorrect functional form of the regression model, or incorrect transformation of data, or mixing observations with different measures of scale. Heteroscedasticity will be tested using Breush-Pagan test as recommended by (Melanie & Eriikka, 2015). This will test the null hypothesis that the error term has constant variance versus the alternative, that the error term variances are not constant. This means that the error terms are multiplicative function of one or more variables. According to Kothari and Garg (2014), when a p-value ≤ 0.05 it would imply that there will be heteroscedasticity (no constant variance in the error term) and would lead to rejection of null hypothesis at 5 percent level of significance. Large chi-square would indicate heteroscedasticity meaning the error term is not constant.

3.11.6 Autocorrelation Test

Autocorrelation or serial correlation is the similarity of a time series over successive time intervals. It can lead to underestimates of the standard error and can cause you to think predictors are significant when they are not. Autocorrelation is a characteristic of data in which the correlation between the values of the same variables is based on related objects (Park, 2018). It violates the assumption of instance independence, which underlies most of the conventional models. It is the similarity between observations as a function of the time lag between them. The analysis of autocorrelation is a mathematical tool for finding repeating patterns. Autocorrelation signals the processing for analyzing functions or series of values, such as time domain signals. Autocorrelation is a matter of degree, so it can be positive as well as negative. The Durbin Watson test detects the presence of autocorrelation. The Durbin Watson Test is a measure of autocorrelation in residuals from regression analysis. The Durbin Watson test looks for a specific type of serial correlation (Creswell & Creswell, 2017).

3.12 Inferential Statistics Analysis

The inferential statistics induction refers to the use of statistics to make inferences concerning aspects of a population using a sample of the population. The purpose is to give estimation of the needed population after taking a sample (Bredal, Stefansen & Bjørnholt, 2022). Inferential statistics facilitate inferences from sample data to population conditions. The inferential statistics analysis is based on results obtained through analysis of variance (ANOVA), correlation analysis, coefficient analysis and multiple regression analysis (Cantos, 2019). ANOVA is an analysis tool used in statistics that splits an observed aggregate variability found inside a data set into systematic and random factors. The systematic factors have a statistical effect on the given data set, while the random factors do not (Park, 2018).

3.12.1 Correlation Analysis

Correlation analysis is a statistical method used to evaluate the strength of relationship between two quantitative variables (Nikolić, Muresan, Feng, & Singer,

2012). A high or positive correlation means that two or more variables have a strong relationship with each other, and exists if one variable increase simultaneously with the other. A weak or negative correlation exists if one variable decrease when the other increases and the variables are hardly related (Mahdavi, 2013). This statistical is called correlation coefficient (r) which indicate the relationship between the two variables being compared. Correlation is a bivariate analysis that measures the strength of association between two variables and the direction of the relationship (Grekousis, 2020).

The coefficient of determination analyzes the differences in one variable and in a second variable (Cantos, 2019). The Pearson's product moment correlation coefficient was used to establish the strength and the direction of the relationship between dependent and independent variables. Pearson's product-moment coefficient is the measurement of correlation and ranges between +1 and -1. +1 indicates the strongest positive correlation possible, and -1 indicates the strongest negative correlation possible (Se Yoon, 2021). The analysis using Pearson's product moment correlation was built on the assumptions that data was normally distributed.

3.12.2 Multiple Regression Analysis

In statistical modeling, multiple regression analysis is a related technique to assess the relationship between an outcome variable and one or more risk factors or confounding variables (Wondola, Aulele & Lembang, 2020). Multiple regression is an extension of simple linear regression. It is a set of statistical processes used in predetermination of the value of a variable based on the value of two or more other variables (Gunst & Mason, 2018). Multiple regression analysis includes many techniques for modeling and analyzing several variables when the focus is on the relationship between a dependent variable and one or more independent variables (or 'predictors'). The variable to be predicted is referred to as the dependent variable, while the variables used to predict the value of the dependent variable are called the independent variables (Cantos, 2019).

Multiple regression analysis helps one to understand how the typical value of the dependent variable (or 'criterion variable') changes when any one of the independent

variables is varied, while the other independent variables are held fixed (Grekousis, 2020). Multiple regression analysis was used to test the relationship between the independent and the dependent variables of the study. Performance of multiple regression analysis methods in practice depends on the form of the data generating process and the regression approach used (Sarstedt & Mooi, 2019). This study investigated the relationship between supply chain governance and performance of agro processing firms.

3.12.3 Statistical Measurement Model

Multiple regression model (1) was used to determine the relationship between supply chain governance and performance of agro processing firms in Kenya. The multiple regression analysis model without the moderator is illustrated below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \dots \dots \dots (1)$$

Where:

Y = Performance of Agro Processing Firms

β₀ = Constant or intercept of the variable Y

X₁ = Contractual Supply Chain Governance

X₂ = Relational Supply Chain Governance

X₃ = Transactional Supply Chain Governance

X₄ = Transformational Supply Chain Governance

ε = Error term

β₁, β₂, β₃, β₄ are the coefficients of the independent variables.

3.12.4 Moderating Effect Analysis

A moderating variable affects the direction and strength of the relationship between independent or predictor variables and a dependent or criterion variable. This variable may reduce or enhance the strength of the relationship between an independent variable and a dependent variable, or alter the direction of the relationship between the dual to negative from positive and viceversa. A moderator is supported if the interaction of independent variable and moderator on the outcome of the variable is significant (Moser & Korstjens, 2018). The moderating variable of this study was information flow.

Moderated Multiple Regression analysis was followed to determine the moderating effect of information flow on the relationship between supply chain governance and performance of agro processing firms in Kenya. This model was used to test hypothesis 5. The moderating model tests whether the prediction of a dependent variable Y, from an independent variable X, varies across levels of a third variable Z. The moderating variable affect the strength and direction of the relationship between an independent variable and with an outcome of enhancing, reducing or altering the influence of the independent variable (Wondola, *et al.*, 2020). Notably, Mogaka (2023) successfully utilized the moderated multiple regression analysis.

The moderated multiple regression analysis is illustrated below:

$$Y = \beta_0 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + \beta_4 X_4 * Z + \epsilon \dots \dots \dots (2)$$

Where:

Y = Performance of Agro Processing Firms

β_0 = Constant or intercept of the variable Y

$\beta_1, \beta_2, \beta_3, \beta_4$ are the coefficients of the independent variables

X₁ = Contractual Supply Chain Governance

X₂ = Relational Supply Chain Governance

X_3 = Transactional Supply Chain Governance

X_4 = Transformational Supply Chain Governance

Z = Information Flow (moderator)

ϵ = Error term

3.12.5 Hypothesis Testing

Hypothesis testing is a statistical method used to determine if there is enough evidence in a sample data to draw conclusions about a population (Neyman & Pearson, 1933). It involves formulating two competing hypotheses, the null hypothesis (H_0) and the alternative hypothesis (H_a), and then collecting data to assess the evidence (Siegel, 2016). The hypothesis of this study was tested by running an Ordinary Least Square regression model for the combined sub-constructs of each independent variable against the combined measures of the dependent variable. The acceptance or rejection criteria was that, if the p-value is greater than 0.05, the study fails to reject the H_0 , but if p-value is less than 0.05, the H_0 is rejected.

In this study, two measures of F-Test and T-Test were used in the analysis to fit into the regression model. F-test is any statistical test used to compare the variances of two samples or the ratio of variances between multiple samples. According to Snedecor and Cochran (1983), F-test is used to test if the variances of two populations are equal. T-test is an inferential statistic used to determine if there is a significant difference between the means of two groups and how they are related. T-tests are used when the data sets follow a normal distribution and have unknown variances (Wang & Jia, 2022). The F-Test, which is a predictive test, was used to check the overall regression model, while the T-Test was used to test whether or not each of the independent or predictor variables of this study has a statistically relevant effect on the dependent variable of the study. The T-tests for the variables of the study are illustrated in Table 3.2.

Table 3.2: Hypothesis Testing

Research Hypotheses	Hypothesis Test	Decision Rule
H₀₁ : Contractual supply chain governance does not significantly affect the performance of agro processing firms in Kenya.	T-test/ F-Test	If the $P \leq$ 0.05, reject
H_{a1} : Contractual supply chain governance has a positive significant effect on the performance of agro processing firms in Kenya.		H₀₁ : and accept H_{a1}
H₀₂ : Relational supply chain governance does not significantly affect the performance of agro processing firms in Kenya.	T-test/ F-Test	If the $P \leq$ 0.05, reject
H_{a2} : Relational supply chain governance has a positive significant effect on the performance of agro processing firms in Kenya.		H₀₂ : and accept H_{a2}
H₀₃ : Transactional supply chain governance does not significantly affect the performance of agro processing firms in Kenya.	T-test/ F-Test	If the $P \leq$ 0.05, reject
H_{a3} : Transactional supply chain governance has a positive significant effect on the performance of agro processing firms in Kenya.		H₀₃ : and accept H_{a3}
H₀₄ : Transformational supply chain governance does not significantly affect the performance of agro processing firms in Kenya.	T-test/ F-Test	If the $P \leq$ 0.05, reject
H_{a4} : Transformational supply chain governance has a positive significant effect on the performance of agro processing firms in Kenya.		H₀₄ : and accept H_{a4}
H₀₅ : Information flow does not moderate the relationship between supply chain governance and performance of agro processing firms in Kenya.	T-test/ F-Test	If the $P \leq$ 0.05 for all
H_{a5} : Information flow moderates the relationship between supply chain governance and the performance of agro processing firms in Kenya.	Testing the variables at 5% or 95% level of significance.	independent variables, reject H_{05s} and accept H_{a5s}

3.13 Operationalization of the Study Variables

Operationalization is the process of strictly defining variables into measurable factors and by which concepts are linked to variables and researchers set indicators to measure concepts (Armstrong, 2019). The process defines concepts that are difficult to perceive and allows them to be measured, empirically and quantitatively. This process involves identifying operations that will showcase values of a variable under study. In other words, operationalization specifies concrete observations that are thought to empirically capture a concept existing in the real world (Bredal, Stefansen & Bjørnholt, 2022). It involves defining how a concept can be measured, observed, or manipulated. By using operationalization, researchers can systematically collect and evaluate phenomena that can't be observed directly. The main steps for operationalization are identification of the main concepts of the study, choosing a variable to represent each of the concepts, and selecting the indicators for each variable of the study (Denzin, 2017). The operationalization of the study variables is illustrated in Table 3.3.

Table 3.3: Operationalization of the Study Variables

Type of Variable	Variable	Indicators
Dependent Variable	Performance of Agro Processing Firms	<ul style="list-style-type: none"> • Profitability • Sales growth • Market share
Independent Variables	Contractual Supply Chain Governance	<ul style="list-style-type: none"> • Formal contracts • Mutual contracts • Internal rules
	Relational Supply Chain Governance	<ul style="list-style-type: none"> • Customer relationship • Supplier relationship • Social processes and regulations
	Transactional Supply Chain Governance	<ul style="list-style-type: none"> • Selective incentives • Monitoring capacity • Setting goals
	Transformational Supply Chain Governance	<ul style="list-style-type: none"> • Business culture change • Innovations • Employee expectation
Moderating Variable	Information Flow	<ul style="list-style-type: none"> • Information sharing • Information quality • Information processing capability

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents empirical results of the target firms that formed the study whose general objective was to determine the effect of supply chain governance on performance of agro processing firms in Kenya. This involved data analysis, interpretation and discussion of the research findings. Descriptive and inferential analysis techniques were used. The descriptive technique involved generation of frequencies, mean, percentages and standard deviation. The inferential analysis technique involved establishing significant linear relationship between the dependent variable and the independent variables. Pearson's correlation analysis and multiple regression analysis were performed under the inferential analysis.

4.1.1 Response Rate

According to Leavy (2017), a response rate analysis is essential to determine whether a study obtained a threshold of participants required to make it valid and effective to be a representative of the targeted population. Response rate is the extent to which the final data sets include all sample members. According to Sarstedt & Mooi (2019), a response rate analysis is essential to determine whether a study obtained a threshold of participants required to make it valid and effective as well as to be a representative of the targeted population. In this study, a total number of 310 questionnaires were administered to 310 respondents. 300 respondents filled and returned the questionnaires. According to De Vaus (2002), the response rate is equal to the number of questionnaires returned divided by the sample size and multiplied by one hundred. Using the above-mentioned formula, the response rate for the study was calculated as indicated below:

$$\text{Response Rate} = \frac{300}{310} \times 100 = 96.77 \text{ per cent}$$

According to Truijens, Van Nieuwenhove, De Smet, Desmet, & Meganck (2021), a response rate of more than 70% is reliable to conduct analysis. This response rate conforms to (Dyer, Singh, & Hesterly, 2018) affirmation that a 50% response rate is sufficient for analysis; a rate of 60% is good and that of above 70% is exceptional. The outstanding response rate was attributed to the method of data collection used, whereby the researcher, with assistance from research assistants administered questionnaires to the respondents who filled them after which they were then collected. In this regard the distribution of survey questionnaire across a wide geographical area of agro processing firms provided a broad overview of supply chain governance among the firms in Kenya. These results echo the findings of Armstrong (2019), who observed that the response rate as the extent to which the final data set includes all sample members and it is calculated as the number of people with whom interviews are completed divided by the total number of people in the entire sample, including those who refused to participate and those who were unavailable. These findings are represented in Table 4.1.

Table 4.1: Response Rate

Rate of Response	Respondents	Percentage
Returned	300	96.77
Not Returned	10	3.23
Total Distributed	310	100

4.1.2 Reliability Analysis

This study carried out a pilot test to establish the reliability of the research instrument. The participants in the pilot test were not included in the actual study. The reliability of research instrument refers to its ability to produce consistent and steady measurements (Creswell & Creswell, 2017). Reliability of this study instrument was assessed through Cronbach Alpha (α) that determined the internal consistency. The Cronbach's alpha coefficient is supposed to range between 0 and 1 (Taber, 2018). The higher the alpha coefficient values, the more reliable the scales. Acceptable alpha should be at-least 0.70 or above, which may depend on the number

of items in the scale. This indicates acceptable reliability and gives unbiased estimate of data generalizability (Cronbach, 1951). According to Heale and Twycross (2015) as cited by Kiswili, Shale & Osoro (2021), a coefficient of 0.70 or more implies high degree of reliability of the data, and higher alpha coefficient values means that scales are more reliable.

Table 4.2 shows the outcome of the reliability of the questionnaire as derived from the pilot study. The coefficients presented showed that contractual supply chain governance had 0.872, relational supply chain governance had 0.708, transactional supply chain governance had 0.812, transformational supply chain governance had 0.733, information flow had 0.722, and performance of agro processing firms had 0.833. The findings indicated that all the variables were reliable and had attained the recommended reliability measurement level of 0.7. This indicated that the scales in question had a high degree of internal consistency among the measurement items. This finding is in line with Park (2018), who observed that reliability is the extent to which a measurement of an instrument or procedure yields the same results on repeated trials. Without reliable measures, scientists cannot build or test theory, and therefore cannot develop productive and efficient procedures for improving human wellbeing.

Table 4.2: Reliability Tests of the Factors

Factors/Variables	Cronbach's Alpha Value	Items	Comments
Contractual supply chain governance	0.872	10	Accepted
Relational supply chain governance	0.708	10	Accepted
Transactional supply chain governance	0.812	10	Accepted
Transformational supply chain governance	0.733	10	Accepted
Informational flow	0.722	10	Accepted
Performance of agro processing firms	0.833	10	Accepted

n=34

4.1.3 Validity Results

The study used construct validity, content validity and face validity to determine validity of the research instrument, and to ensure that what was supposed to be measured and performed is achieved with minimal deviation. Validity test refers to the degree in which a test or other measuring device is truly measuring what it is intended it to measure (Creswell & Creswell, 2017). The construct validity is concerned with how well a set of indicators represent or reflect a concept that is not directly measurable. The two main types of construct validity are convergent validity, which indicates the extent to which a measure corresponds to measures of related constructs and discriminant validity that points out the extent to which a measure is unrelated or negatively related to measures of distinct constructs. Construct validity is the appropriateness of inferences made on the basis of observations or measurements (often test scores), specifically whether a test can reasonably be considered to reflect the intended construct (Cobern & AJ, 2020). Construct validity was achieved by designing the questionnaires according to the research variables and their respective indicators of measurement. It was also, achieved through restricting the questions to the conceptualizations of the variables and ensuring that only the predictors of a specific variable fell within the same construct or measure.

Heale and Twycross (2015), posited that content validity is a qualitative form of validity where the scope of the definition is made very clear and the analysts or judges decide if the test is entirely within the scope. Content validity is concerned with the tests whether items are a representative sample of all items within the content domain of interest of a particular construct (Pascoe, 2022). Content validity test was achieved by asking a number of questions about the instrument and asking expert judges in the field for their opinion.

According to Se Yoon (2021), face validity is a subjective judgment on the operationalization of a construct and a characteristic associated with a psychological test and its individual items. Face validity tests to the extent to which a test appears to measure what it is intended to measure. According to Heale and Twycross (2015),

content validation tests whether items are a representative sample of all items within the content domain of interest. Face validity was assessed according to the phenomenologic similarities between the model and the condition being modeled. The researcher sought the opinion and assistance of experts in the field of supply chain management on whether the questionnaire appeared suitable in both design and structure to measure the required face validity.

4.2 Demographic Information

This section analyses the demographic characteristics of the respondents. This is in reference to gender, age bracket, education level, current position, marital status, years of service, current position and department.

4.2.1 Gender of Respondents

The findings in Table 4.3 revealed that majority of the respondents, 207 (69%) were male, while 93 (31%) were female. This implied that both the male gender and the female gender participated in the study. This distribution is good and indicated a fair gender balance, which was within the requirements of the two-thirds gender rule as provided in the Kenyan Constitution (2010). This also considered the gender parity requirements by the Kenyan gender crusaders. The opinions of both gender on matters strategic change implementation were accommodated following the fair balance of gender.

The findings indicate that while male respondents were more than female respondents, there was diversity in the respondents and hence the data collected was not expected to be distorted by factors relating to data distribution. In spite of women being major actors in Kenya's economy, and notably in agriculture and the informal business sector, men dominate in the formal sector. The finding also indicates that agro processing firms are in compliance with the gender equality rule in the Kenyan constitution which states that none of the gender should be more than two thirds. It proves that agro processing firms are sensitive companies that give equal opportunities to both males and females.

Table 4.3: Distribution of Respondents by Gender

Gender	Frequency	Percentage
Male	207	69.0
Female	93	31.0
Total	300	100

n=300

4.2.2 Respondents' Qualifications

Respondents' highest level of education was sought and majority 178 (59.3%) indicated that they had bachelor degree, while 61 (20.3%) had diploma level, 45 (15%) of the respondents were holders post-graduate level (Master and PhD), 8 (2.7%) of the respondents had Certified Public Accountants level and 8 (2.7%) were certificate holders as shown in Table 4.4. This implied that the respondents were qualified and understood the objectives of this study and able to offer relevant information. In Kenya, mostly a bachelor's degree is sufficient to enable one to rise to top positions. The results showed that that the employees in agro processing firms generally have a higher level of education and thus are expected to undertake business activities better and with more output. The highly skilled personnel enhance production of high-quality outcomes and effective quality improvement in a firm.

These findings tally with Sarstedt & Mooi (2019), who established that the level of education influences the performance of the organizations. The role of education as a change agent is indisputable, and has always been a central mechanism for transmission of skills and values for the sustenance of shortages and enhance proper forecasting of real lead time. The findings confirm that the respondents possess the required skills and competencies, and were therefore in a position to give tangible information relating to performance agro processing firms in Kenya.

Table 4.4: Respondents' Qualifications

Education Level	Frequency	Percentage
Certificate	8	2.7
Diploma	61	20.3
Degree	178	59.3
Post Graduate Level (Master and PhD)	45	15.0
Other (CPA)	8	2.7
Total	300	100

n=300

4.2.3 Respondents' Years Worked

The respondents were requested to indicate the number of years in service. From the findings as indicated in Table 4.5, majority of the respondents 129 (43%) indicated that they had been in service for over 9 years, while 119 (39.6%) had worked for 6 to 8 years, 44 (14.7%) had served for 3 to 5 years and 8 (2.7%) had worked for 2 years and below. This indicated that the information was collected from respondents who had worked a long period and had work experience to provide reliable information on the effect of supply chain governance on performance of agro processing firms in Kenya. The findings also indicate that employees stay in employment for long periods within agro processing firms, and therefore a good indication of high retention levels of workers in this sector.

Table 4.5: Respondents' Years Worked

Years Worked	Frequency	Percentage
0-2 Years	8	2.7
3-5 Years	44	14.7
6-8 Years	119	39.6
9 and above	129	43.0
Total	300	100

n=300

4.2.4 Respondent's Current Position

The study sought on the respondents' current positions in the agro processing firms. This was important for determining reliability of information provided and determine whether the respondents were in a position to provide reliable information. From the findings as indicated in Table 4.6, majority 109 (36.4%) of the respondents were the supply chain managers, 76 (25.3%) of the respondents were involve in administration activities like human resource management and finance management, 54 (18%) of the respondents were production managers, 37 (12.3%) respondents were supervisors, 16 (5.3%) were warehouse assistants, while 8 (2.7%) of the respondents were managing directors. This implied that the majority of respondents were senior and involved in the management of firms, and offered the required information for this study.

Table 4.6: Respondents' Current Position

Current Position	Frequency	Percentage
Administration (HRM & Finance Managers)	76	25.3
Managing Directors	8	2.7
Warehouse Assistants	16	5.3
Production Managers	54	18.0
Supervisors	37	12.3
Supply Chain Managers	109	36.4
Total	300	100

n=300

4.2.5 Respondent's Department

The study also sought to determine the departments of the respondents. This was important for determining reliability of information provided and determines whether the respondents were in a position to provide reliable information. The researcher focused on three departments of each agro processing firm namely; the supply chain, Administration that includes human resource management and finance, and

production. From the findings as indicated in Table 4.7, majority 148 (49.2%) of the respondents were from supply chain department, 83 (27.8%) of the respondents were from administration (finance and human resource management) department, and 69 (23%) of the respondents were from production department. This implied that the respondents were from the targeted departments, and were capable to provide the required information for this study.

Table 4.7: Respondents' Department

Department	Frequency	Percent
Supply Chain	148	49.2
Administration (Finance & HRM)	83	27.8
Production	69	23.0
Total	300	100

n=300

4.3 Descriptive Statistics

The aim of this study was to determine the effect of supply chain governance on the performance of agro processing firms in Kenya. This section sought to provide descriptive statistics of the various variables namely; contractual supply chain governance, relational supply chain governance, transactional supply chain governance, informational flow, and performance of agro processing firms. According to Creswell and Creswell (2017), descriptive analysis is necessary in a study as it helps to stipulate the findings as they are and forms the basis for the researcher to deeply understand the phenomenon under which the research is based on. Descriptive statistics is the discipline that describes quantitative as the main features of a collection of information.

The descriptive statistics are distinguished from inferential statistics in that descriptive statistics aim to summarize a sample, rather than use the data to learn about the population that the sample of data is thought to represent (Sarstedt & Mooi, 2019). Even when a data analysis draws its main conclusions using inferential

statistics, descriptive statistics are also presented. This finding is in line with Se Yoon (2021), who observed that some measures that are commonly used to describe a data set are measures of central tendency and measures of variability or dispersion. Measures of central tendency include the mean, median and mode, while measures of variability include the standard deviation such as variance, the minimum and maximum values of the variables, kurtosis and skewness. This echoes the findings of Armstrong (2019), who observed that when a sample consists of more than one variable, descriptive statistics may be used to describe the relationship between pairs of variables.

The type of statistics used depended on the types of variables in the study and the scale of measurements. The main descriptive statistics used in the study were the frequencies, percentages, means and the standard deviation. The mean is the average score of the data values. The interpretation of the mean is that the higher the mean, the higher the data values. A high mean would signify that more respondents indicated the highest values in the Likert scale while a low mean would signify that more respondents indicated the least values on the Likert's scale. Standard deviation is a statistic that measures the dispersion of a dataset relative to its mean. It measures the spread of data values around the mean. The smaller the standard deviation, the closer the data values to the mean and the higher the standard deviation, the further the data values are spread out from the mean, the higher the standard deviation. (Derrick & White, 2017). The study adopted a Likert Scale of 1 to 5, where strongly disagree=1, disagree=2, not sure=3, agree=4, and strongly agree=5 (Likert, 1932).

4.3.1 Descriptive Statistics for Contractual Supply Chain Governance

The study sought to examine the influence of supply chain governance on performance of agro processing firms in Kenya. The first objective of the study was to establish the influence of contractual supply chain governance on performance of agro processing firms in Kenya. The respondents were required to indicate the extent to which contractual supply chain governance influenced performance of agro processing firms in Kenya. This was on a likert scale of strongly disagree, disagree,

not sure, agree and strongly agree. The results were expressed as frequencies, percentages, mean and standard deviation as shown in Table 4.8.

Table 4.8: Descriptive Statistics for Contractual Supply Chain Governance

Statements	1	2	3	4	5	Mean	Std Dev
	%	%	%	%	%		
The firm uses formal contracts	8 (2.7)	8 (2.7)	0(0)	114 (38)	170 (56.7)	4.40	0.856
Mutual contracts help the firm in task allocation	8 (2.7)	8 (2.7)	0 (0)	113 (37.6)	171 (57)	4.40	0.856
The firm uses internal rules to manage the relationships between parties to a transaction	8 (2.7)	8 (2.7)	0 (0)	135 (45)	149 (49.6)	4.34	0.934
The contracts help the firm in setting enforceable standards	8 (2.7)	23 (7.7)	45 (15)	82 (27.3)	142 (47.3)	4.48	0.935
The firm maintains the independent legal committees that manage firm's contracts with stakeholders	0 (0)	0 (0)	37 (12.3)	105 (35)	158 (52.7)	3.99	0.916
Contractual mechanisms reduce opportunism and favor performance	0 (0)	0 (0)	16 (5.3)	104 (34.7)	180 (60)	4.34	0.910
Contracting facilitates commitment which leads to successful conflict management	0 (0)	8 (2.7)	16 (5.3)	67 (22.3)	209 (69.7)	4.61	0.632
Mutual trust in contracts help in managing customer and supplier relationships	0 (0)	16 (5.3)	23 (7.7)	97 (32.3)	164 (54.7)	4.53	0.633
The firm identify suppliers through the process of vendor rating and accreditation	0 (0)	0 (0)	30 (10)	69 (23)	201 (67)	4.41	0.847
The firm has long term contracts with its main suppliers	0 (0)	0 (0)	0 (0)	126 (42)	174 (58)	4.30	0.983

n=300; Key: Strongly Disagree=1, Disagree=2, Not Sure=3, Agree=4, and Strongly Agree=5

The results on the statement of “The firm has formal contracts”, the majority of the respondents, 170 (56.7%) gave strongly agreed and 114 (38%) respondents agreed, while a few of the respondents, 8 (2.7%) gave disagreed and 8 (2.7%) strongly disagreed to the statement as evidenced by a mean of 4.40 and a standard deviation of 0.856. On the statement, “Mutual contracts help the firm in task allocation”, the majority of respondents, 171 (57%) gave strongly agreed and 113 (37.6%) agreed, while a few of the respondents, 8 (2.7%) disagreed and 8 (2.7%) strongly disagreed to the statement as supported by a mean of 4.40 and a standard deviation of 0.856. Regarding the statement of “The firm uses internal rules to manage the relationships between parties to a transaction”, the majority of the respondents, 149 (49.6%) gave strongly agreed and 135 (45%) agreed, while a few of the respondents, 8 (2.7%) disagreed and 8 (2.7%) strongly disagreed to the statement as supported by a mean of 4.34 and a standard deviation of 0.934.

About the statement of “The contracts help the firm in setting enforceable standards”, the majority of the respondents, 142 (47.3%) gave strongly agreed and 82 (27.3%) agreed, while a few of the respondents, 45 (15%) were not sure, 23 (7.7%) disagreed and 8 (2.7%) disagreed to the statement as shown by a mean of 4.48 and a standard deviation of 0.935. On the other aspect of “The firm maintains the independent legal committees that manage firm's contracts with stakeholders”, the majority of the respondents, 158 (52.7%) gave strongly agreed and 105 (35%) indicated agreed, while a few of the respondents, 37(12.3%) were not sure as evidenced by a mean of 3.99 and a standard deviation of 0.916. Concerning the statement of “Contractual mechanisms reduce opportunism and favor performance”, the majority of the respondents, 180 (60%) gave strongly agreed and 104 (34.7%) agreed, while a few of the respondents, 16 (5.3%) indicated not sure to the statement as evidenced by a mean of 4.34 and a standard deviation of 0.910.

On the statement of “Contracting facilitates commitment that leads to successful conflict management”, the majority of the respondents, 209 (69.7%) gave strongly agreed and 67 (22.3%) agreed, while a few of the respondents, 16 (5.3%) were not sure and 8 (2.7%) disagreed to the statement as evidenced by a mean of 4.61 and a standard deviation of 0.632. On the statement of “Mutual trust in contracts help in

managing customer and supplier relationships”, the majority of the respondents, 164 (54.7%) gave strongly agreed and 97 (32.3%) agreed, while a few of the respondents, 23 (7.7%) were not sure and 16 (5.3%) disagreed to the statement as indicated by a mean of 4.53 and a standard deviation of 0.633. About the statement of “The firm identify suppliers through the process of vendor rating and accreditation”, the majority of the respondents, 201 (67%) gave strongly agreed and 69 (23%) agreed, while a few of the respondents, 30 (10%) indicated not sure to the statement as evidenced by a mean of 4.41 and a standard deviation of 0.847. Finally, on the statement of “The firm has long-term contracts with its main suppliers”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) agreed, while none of the respondents indicated any disagreement to the statement as shown by a mean of 4.30 and a standard deviation of 0.983.

The findings imply that the application of contractual supply chain governance improve the performance of most agro processing firms in Kenya as summarized in table 4.8. This echoes the findings of Cao and Lumineau (2015), who established that contractual supply chain governance enhances performance of firms. According to Hong, *et al.*, (2015), contractual supply chain governance has a positive effect on supply chain performance of construction projects. Zhang, *et al.*, (2016), found out that the contractual supply chain governance is the process of systematically and efficiently managing contract creation, execution, and analysis for the purpose of maximizing financial and operational performance and minimizing risk of the firms. Lu, *et al.*, (2015) observed that the contractual supply chain governance is effective in improving project performance in construction projects in China. Addae-Boateng *et al.* (2015) established that contractual supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms.

4.3.2 Descriptive Statistics for Relational Supply Chain Governance

The study sought to examine the influence of supply chain governance on performance of agro processing firms in Kenya. The second objective of the study was to examine the effect of relational supply chain governance on performance of agro processing firms in Kenya. The respondents were required to indicate the extent to which relational supply chain governance influenced performance of agro processing firms in Kenya. This was on a likert scale of strongly disagree, disagree, not sure, agree and strongly agree. The results were expressed as frequencies, percentages, mean and standard deviation as shown in Table 4.9.

Table 4.9: Descriptive Statistics for Relational Supply Chain Governance

Statements	1	2	3	4	5	Mean	Std.Dev
	%	%	%	%	%		
The firm manages customer relationship through regulations	0(0)	0(0)	0(0)	119(39.7)	181(60.3)	4.37	0.646
The firm manages supplier relationship through collaborative activities	0(0)	0(0)	8(2.7)	127(42.3)	165(55)	4.51	0.590
The firm maintains relational norms with stakeholders through social processes and regulations	0(0)	0(0)	7(2.3)	109(36.3)	184 (61.3)	4.51	0.721
The firm collaborate with its customers and suppliers regularly.	0(0)	0(0)	0(0)	126(42)	174(58)	4.47	0.551
Trust and cooperative spirit help the firm to facilitate joint planning that create a stable and committed relationship	0(0)	0(0)	8(2.7)	67(22.3)	225(75)	4.49	0.601
The firm coordinate and hold regular meetings with its suppliers	0(0)	0(0)	16(5.3)	104(34.7)	180(60)	4.34	0.910
The firm orient and train their customers and suppliers to build the right capacity	0(0)	8(2.7)	16(5.3)	67(22.3)	209(69.7)	4.61	0.632
The firm is flexible and consider views of their suppliers to improve performance	0(0)	8(5.3)	23(7.7)	97(32.3)	164(54.7)	4.53	0.633
Relational processes enhance relationship quality, cooperation and coordination between buyers and suppliers	0(0)	0(0)	30(10)	69(23)	201(67)	4.41	0.847
Relational SCG helps in smoother problem solving and restraints on unethical uses of power	0(0)	0(0)	0(0)	126(42)	174(58)	4.30	0.983

n=300; Key: Strongly Disagree=1, Disagree=2, Not Sure=3, Agree=4, and Strongly Agree=5

The findings on the statement of “The firm manages customer relationship through regulations”, the majority of the respondents, 181 (60.3%) gave strongly agreed and 119 (39.7%) agreed, while none of the respondents indicated any disagreement to the statement as evidenced by a mean of 4.37 and a standard deviation of 0.646. On the statement of “The firm manages supplier relationship through collaborative activities”, the majority of the respondents, 165 (55%) gave strongly agreed and 127 (42.3%) agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure with the statement as indicated by a mean of 4.51 and a standard deviation of 0.721.

On the statement of “The firm maintains relational norms with stakeholders through social processes and regulations”, the majority of the respondents, 184 (61.3%) gave strongly agreed and 109 (36.3%) agreed to the statement, while a few of the respondents, 7 (2.3%) were not sure with the statement as supported by a mean of as shown by a mean of 4.51 and a standard deviation of 0.590. This echoes the findings of Kiriinya, Ngugi, & Mwangangi (2021), who observed that when relationship management is properly done in regard to collaboration, transparency and process alignment, then it will support performance of pharmaceutical firms in Kenya through increased market share, higher returns on investment, improved customer service levels, reduced lead times, responsiveness and stable supply chains.

On regarding the statement of “The firm collaborate with its customers and suppliers regularly”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) agreed to the statement as supported by a mean of 4.47 and a standard deviation of 0.551. Concerning the statement of “Trust and cooperative spirit help the firm to facilitate joint planning that create a stable and committed relationship”, the majority of the respondents, 225 (75%) gave strongly agreed and 67 (22.3%) agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure with the statement shown by a mean of 4.49 and a standard deviation of 0.601.

About the statement of “The firm coordinate and hold regular meetings with its suppliers”, the majority of the respondents, 180 (60%) gave strongly agreed and 104 (34.7%) agreed to the statement, while a few of the respondents, 16 (5.3%) were not

sure with the statement as supported by a mean of 4.34 and a standard deviation of 0.910. On the statement of “The firm orient and train their customers and suppliers to build the right capacity”, the majority of the respondents, 209 (69.7%) gave strongly agreed and 67 (22.3%) agreed to the statement, while a few of the respondents, 16 (5.3%) were not sure and 8 (2.7%) disagreed to the statement as indicated by a mean of 4.61 and a standard deviation of 0.632. Regarding the statement of “The firm is flexible and consider views of their suppliers to improve performance”, the majority of the respondents, 164 (54.7%) gave strongly agreed and 97 (32.3%) agreed to the statement, while a few of the respondents, 23 (7.7%) were not sure and 16 (5.3%) disagreed to the statement as supported by a mean of 4.53 and a standard deviation of 0.633.

Concerning the statement of “Relational processes enhance relationship quality, cooperation and coordination between buyers and suppliers”, the majority of the respondents, 201 (67%) gave strongly agreed and 69 (23%) agreed to the statement, while a few of the respondents, 30 (10%) were not sure with the statement as shown by a mean of 4.41 and a standard deviation of 0.847. Finally on the statement of “Relational SCG helps in smoother problem solving and restraints on unethical uses of power”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) gave agreed to the statement as supported by a mean of 4.30 and a standard deviation of 0.983. This is in line with the findings of Kiriinya, Ngugi, & Mwangangi (2021), who observed that when relationship management is properly done in regard to collaboration, transparency and process alignment, then it will support performance of pharmaceutical firms in Kenya through increased market share, higher returns on investment, improved customer service levels, reduced lead times, responsiveness and stable supply chains.

The results were a clear indication that relational supply chain governance plays a vital role in the performance of agro processing firms in Kenya as summarized in Table 4.9. The findings agree with those of Lu *et al.*, (2015) that relational governance is effective in improving performance of construction projects in China. According to Ying-Pin Yeh, (2016), relational supply chain governance is positively associated with relationship quality, relational value and firm performance. Dekker *et*

al. (2018) established that relational skills are critical in the successful management of buyer-supplier relationships and help in avoiding high costs of more formal inter-organizational controls. Addae-Boateng *et al.* (2015) established that relational supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms.

The findings are in tandem with Kiriinya, Ngugi & Mwangangi (2021), who observed that when relationship management is properly done in regard to collaboration, transparency and process alignment, then it will support performance of pharmaceutical firms in Kenya through increased market share, higher returns on investment, improved customer service levels, reduced lead times, responsiveness and stable supply chains. According to Obi, Qiang, Dogbe & Pomegbe (2020), the relational governance has a positive effect on supply chain performance and at the same time has an indirect effect on supply chain performance through both information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance. Cao and Lumineau, (2015) pointed out that relational supply chain governance structures assist on performance of China firms. Dong *et al.* (2017) stated that relational supply chain governance improves the buyer and supplier relationships to be more flexible than written contracts in enhancing the performance of China firms.

The respondents were also requested to give their opinion on effect of relational supply chain governance. When the respondents were asked in their own opinion if they agree that relational supply chain governance has effect on performance of agro processing firms in Kenya, the majority of the respondents 263 (87.7%) gave yes answer. However, a few of the respondents 37 (12.3%) gave a no response. The respondents who gave yes answer explained that relational supply chain governance has a significant and positive effect on performance of agro processing firms in Kenya.

4.3.3 Descriptive Statistics for Transactional Supply Chain Governance

The study sought to examine the influence of supply chain governance on performance of agro processing firms in Kenya. The third objective of the study was to establish the influence of transactional supply chain governance on performance of agro processing firms in Kenya. The respondents were required to indicate the extent to which transactional supply chain governance influenced performance of agro processing firms in Kenya. This was on a likert scale of strongly disagree, disagree, not sure, agree and strongly agree. The results were expressed as frequencies, percentages, mean and standard deviation as shown in Table 4.10.

Table 4.10: Descriptive Statistics for Transactional Supply Chain Governance

Statements	1	2	3	4	5	Mean	Std.Dev
	%	%	%	%	%		
The firm promote compliance by followers through selective incentives	0(0)	0(0)	0(0)	119(39.7)	181(60.3)	4.37	0.646
The firm enhances monitoring capacity on employees to ensure performance	0(0)	0(0)	7(2.3)	109(36.3)	184(61.4)	4.51	0.590
The firm promote compliance by followers through setting goals	0(0)	0(0)	8(2.7)	127(42.3)	165(55)	4.51	0.721
The firm encourage and support the initiatives of individual employees to explore new opportunities for the benefit of the firm	0(0)	0(0)	0(0)	126(42)	174(58)	4.47	0.551
Supervision and organization play a big role in the performance of the firm	0(0)	0(0)	0(0)	119(39.7)	181(60.3)	4.37	0.646
The firm provide bonuses and merits or recognition to employees when they meet certain goals	0(0)	0(0)	7(2.3)	109(36.3)	184(61.4)	4.51	0.590
The firm uses selective incentives as a form of managerial governance to achieve the firm's goals	8(2.7)	8(2.7)	0(0)	114(38)	170(56.6)	4.40	0.856
The firm uses monitoring capacity as managerial governance to achieve the firm's goals	8(2.7)	8(2.7)	0(0)	113(37.6)	171(57)	4.40	0.856
Employees are encouraged by the firm to develop new products	0(0)	0(0)	7(2.3)	109(36.3)	184(61.4)	4.51	0.590
Transactional supply chain governance enhances entrepreneurial behavior and skills of employees	0(0)	0(0)	8(2.7)	127(42.3)	165(55)	4.51	0.721

n=300; Key: Strongly Disagree=1, Disagree=2, Not Sure=3, Agree=4, and Strongly Agree=5

The findings on the statement of “The firm promote compliance by followers through selective incentives”, the majority of the respondents, 181 (60.3%) gave strongly agreed and 119 (39.7%) gave agreed to the statement as evidenced by a mean of 4.37 and a standard deviation of 0.646. Concerning the statement of “The firm enhances monitoring capacity on employees to ensure performance”, the majority of the respondents, 184 (61.4%) gave strongly agreed and 109 (36.3%) gave agreed to the statement, while a few of the respondents, 7 (2.3%) were not sure with the statement as shown by a mean of 4.51 and a standard deviation of 0.590.

On the statement of “The firm promote compliance by followers through setting goals”, the majority of the respondents, 165 (55%) gave strongly agreed and 127 (42.3%) agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure with the statement as supported by a mean of 4.51 and a standard deviation of 0.721. Regarding the statement of “The firm encourage and support the initiatives of individual employees to explore new opportunities for the benefit of the firm”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) gave agreed to the statement as indicated by a mean of 4.47 and a standard deviation of 0.551. On the statement of “Supervision and organization plays a big role in the performance of the firm”, the majority of the respondents, 181 (60.3%) gave strongly agreed and 119 (39.7%) gave agreed to the statement as supported by a mean of 4.37 and a standard deviation of 0.646.

About the statement of “The firm provide bonuses and merits or recognition to employees when they meet certain goals”, the majority of the respondents, 184 (61.4%) gave strongly agreed and 109 (36.3%) gave agreed to the statement, while a few of the respondents, 7 (2.3%) were not sure with the statement as evidenced by a mean of 4.51 and a standard deviation of 0.590. Regarding the statement of “The firm uses selective incentives as a form of managerial governance to achieve the firm's goals”, the majority of the respondents, 170 (56.6%) gave strongly agreed and 114 (38%) agreed to the statement, while a few of the respondents, 8 (2.7%) gave disagreed and 8 (2.7%) strongly disagreed to the statement as shown by a mean of 4.40 and a standard deviation of 0.856. Concerning the statement of “The firm uses monitoring capacity as managerial governance to achieve the firm's goals”, the

majority of the respondents, 171 (57%) gave strongly agreed and 113 (37.6%) agreed to the statement, while a few of the respondents, 8 (2.7%) gave disagreed and 8 (2.7%) strongly disagreed to the statement as supported by a mean of 4.40 and a standard deviation of 0.856.

Regarding the statement of “Employees are encouraged by the firm to develop new products and ideas”, the majority of the respondents, 184 (61.4%) gave strongly agreed and 109 (36.3%) agreed to the statement, while a few of the respondents, 7 (2.3%) disagreed were not sure with the statement as evidenced by a mean of 4.51 and a standard deviation of 0.590. Finally, on the statement of “Transactional supply chain governance enhance entrepreneurial behavior and skills of employees”, the majority of the respondents, 165 (55%) gave strongly agreed and 127 (42.3%) agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure with the statement as shown by a mean of 4.51 and a standard deviation of 0.721.

The findings were a clear indication that transactional supply chain governance enhance the performance of agro processing firms in Kenya as summarized in Table 4.10. The findings compare well with that by Dolci, Maçada and Paiva (2017) who identified that SCG comprising transactional aspects has a positive influence on operational and financial supply chain performance of firms. They found out that transactional SCG is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. According to Murrell, Karalashvili and Francis (2023), established that personal trust, mutual interests, and third parties are important in enforcing agreements to trade under transactional SCG. They concluded that the transactional SCG structures encourage and support the initiatives of individual employees to explore new opportunities, to develop new products, and to improve work procedures for the benefit of their firms. Williamson (1986) found out that the transactional SCG structure accounts for the actual cost of outsourcing production of products or services including transaction costs, contracting costs, coordination costs, and search costs to improve performance of firms.

4.3.4 Descriptive Statistics for Transformational Supply Chain Governance

The study sought to examine the influence of supply chain governance on performance of agro processing firms in Kenya. The fourth objective of the study was to determine the influence of transformational supply chain governance on performance of agro processing firms in Kenya. The respondents were required to indicate the extent to which transformational supply chain governance influenced performance of agro processing firms in Kenya. This was on a likert scale of strongly disagree, disagree, not sure, agree and strongly agree. The results were expressed as frequencies, percentages, mean and standard deviation as shown in Table 4.11.

Table 4.11: Descriptive Statistics for Transformational Supply Chain Governance

Statements	1 %	2 %	3 %	4 %	5 %	Mean	Std.Dev
Business culture change is important for the success of the firm	0(0)	0(0)	8(2.7)	127(42.3)	165(55)	4.51	0.721
The firm promote innovations then guide, encourage, empower and facilitate employees	0(0)	0(0)	0(0)	126(42)	174(58)	4.47	0.551
Employee expetation depend on motivation of workers by setting more challenging expectations to achieve higher performance	0(0)	0(0)	8(2.7)	67(22.3)	225(75)	4.49	0.601
The roles of principals and agents or the interaction situation in the firm is restructured	0(0)	8(2.7)	16(5.3)	67(22.3)	209(69.7)	4.61	0.632
The firm rewards best performing employees	0(0)	16(5.3)	23(7.7)	97(32.3)	164(54.7)	4.53	0.633
The firm considers views of their workers, customers and suppliers	0(0)	0(0)	30(10)	69(23)	201(67)	4.41	0.847
The firm ensures that its workers have the right capacity	0(0)	0(0)	0(0)	126(42)	174(58)	4.30	0.983
Transformation of a firm needs visionary and strategist managers	0(0)	0(0)	8(2.7)	67(22.3)	225(75)	4.49	0.601
The firm must create an environment in which employees can accept and execute their responsibilities with confidence	0(0)	8(2.7)	16(5.3)	67(22.3)	209(69.7)	4.61	0.632
Transformational SCG has helped in improving performance of the firm	0(0)	0(0)	0(0)	126(42)	174(58)	4.30	0.983

n=300; Key: Strongly Disagree=1, Disagree=2, Not Sure=3, Agree=4, and Strongly Agree=5

The findings on the statement of “Business culture change is important for the success of the firm”, the majority of the respondents, 165 (55%) gave strongly agreed and 127 (42.3%) gave agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure as supported by a mean of 4.51 and a standard deviation of 0.721. On the statement of “The firm promote innovations then guide, encourage, empower and facilitate employees”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) gave agreed to the statement evidenced by a mean of 4.47 and a standard deviation of 0.551.

About the statement of “Employee expectation depend on motivation of workers by setting more challenging expectations to achieve higher performance”, the majority of the respondents, 225 (75%) gave strongly agreed and 67 (22.3%) agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure as shown by a mean of 4.49 and a standard deviation of 0.601. Regarding the statement of “The roles of principals and agents or the interaction situation in the firm is restructured”, the majority of the respondents, 209 (69.7%) gave strongly agreed and 67 (22.3%) agreed to the stamen, while a few of the respondents, 16 (5.3%) were not sure and 8 (2.7%) gave disagreed to the statement as supported by a mean of 4.61 and a standard deviation of 0.632. Concerning the statement of “The firm rewards best performing employees”, the majority of the respondents, 164 (54.7%) gave strongly agreed and 97 (32.3%) gave agreed to the statement, while a few of the respondents, 23 (7.7%) were not sure and 16 (5.3%) disagreed to the statement as shown by a mean of 4.53 and a standard deviation of 0.633.

On the statement of “The firm considers views of their workers, customers and suppliers”, the majority of the respondents, 201 (67%) gave strongly agreed and 69 (23%) gave agreed to the statement, while a few of the respondents, 30 (10%) were not sure as evidenced by a mean of 4.41 and a standard deviation of 0.847. Regarding the statement of “The firm ensures that its workers have the right capacity”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) gave agreed to the statement as supported by a mean of 4.30 and a standard deviation of 0.983. Concerning the statement of “Transformation of a firm needs visionary and strategist managers”, the majority of the respondents, 225 (75%) gave

strongly agreed and 67 (22.3%) gave agreed to the statement, while a few of the respondents, 8 (2.7%) were not sure as indicated by a mean of 4.49 and a standard deviation of 0.601.

On the statement of “The firm must create an environment in which employees can accept and execute their responsibilities with confidence”, the majority of the respondents, 209 (69.7%) gave strongly agreed and 67 (22.3%) agreed to the statement, while a few of the respondents, 16 (5.3%) were not sure and 8 (2.7%) disagreed to the statement as shown by a mean of 4.61 and a standard deviation of 0.632. Finally, on the statement of “Transformational supply chain governance has helped in improving performance of the firm”, the majority of the respondents, 174 (58%) gave strongly agreed and 126 (42%) gave agreed to the statement as supported by a mean of 4.30 and a standard deviation of 0.983.

The results clearly indicated that transformational supply chain governance enhances the performance of agro processing firms in Kenya as summarized in Table 4.11. The findings are in agreement with a number of researchers who established that transformational SCG plays a big role on performance of firms when implemented with proper structures. Gupta, Kumar, Kusi-Sarpong, Jabbour and Agyemang (2021) established that information technology is one of the enablers that organizations need to focus much in order to transform and improve their performance. They further stated that transformational SCG brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms, and the managers must create an environment in which employees can accept and execute their responsibilities with confidence.

Lu, Wang and Wang (2023) found out that many companies through transformational SCG structure have invested in greater supply chain digitization over the years to cope up with supply chain disruptions and to ensure performance. Pupkin (2023) noted that transformational governance model seeks to address current

challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making for better performance. Papadopoulos, Gunasekaran, Dubey and Wamba (2017) found out that transformational SCG faces many challenges at the implementation stages as resistance to change, integration of new technologies, data integration and analytics, disruption to existing processes, cost, talent and skills. But when fully implemented then the firms increase their performance. Aben, van der Valk, Roehrich and Selviaridis (2021) stated that there is need for comprehensive overhaul and modernization of a business's supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Dubey, Gunasekaran, Childe, Papadopoulos and Fosso-Wamba, (2017) established that transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms.

4.4 Qualitative Analysis

Qualitative analysis is the process of taking a closer look at results from surveys, online reviews, website recordings, emails, interviews, and other text sources by using tools like thematic analysis, which is a method of analyzing qualitative data. The themes were drawn from qualitative responses received from the respondents. Many potential themes were manually coded for purposes of establishing patterns.

4.4.1 Contractual Supply Chain Governance

The participants of the study were asked to indicate the other effects of contractual supply chain governance. The study established that 38.0% of the agro-processing firms in Kenya improved their quality control; 32.3% reduced contractual risks; and 29.7% enhanced collaboration as a result of contractual supply chain governance respectively. The findings are presented in the Table 4.12. The most prominent effect observed is the enhancement of quality control mechanisms, reported by 38.0% of the participating firms. This suggests that contractual supply chain governance fosters a more structured and rigorous approach to quality management within the supply chain. This can be attributed to well-defined quality standards and inspection

procedures stipulated in the contracts, leading to better monitoring and production of higher quality goods. A significant portion (32.3%) of the firms attributed a reduction in contractual risks to contractual supply chain governance. This indicates that clearly defined contracts and risk mitigation strategies embedded within contractual supply chain governance frameworks help to minimize potential disruptions, delays, or financial losses arising from unforeseen circumstances. Interestingly, 29.7% of the firms reported experiencing improved collaboration as a result of contractual supply chain governance. Firstly, well-articulated contracts can promote clearer communication and expectations between actors in the supply chain. Secondly, of contractual supply chain governance might encourage collaborative problem-solving mechanisms to address challenges that arise throughout the production process.

The study's findings resonate with existing research on contractual supply chain governance, highlighting its potential to strengthen performance within agro-processing supply chains in Kenya. The findings agree with the results of other researchers who established that contractual SCG influence performance of firms. Cao and Lumineau, (2015) established that effects of contracts depend on the types of provisions included between the consequences of control and coordination provisions for better performance, and concluded that ontractual SCG improve performance of firms. Guo, Qian and He, (2015) found out that the contractual SCG is important in improving project performance in construction projects in China. Hong, Zhipeng, Govindan and Zavadskas, (2015) pointed out that contractual SCG has a positive effect on supply chain performance of construction projects, and trust showed some effect on both cooperation and performance. Addae-Boateng *et al.* (2015) stated that contractual SCG manage the relationships between parties to a transaction and reduce opportunism to increase performance of the Chinese and Ghanaian firms.

Table 4.12: Contractual Supply Chain Governance

Thematic Areas	Frequency	Percentage
Improved Quality Control	114	38.0
Reduced contractual risks	97	32.3
Enhanced Collaboration	89	29.7
Total	300	100.0

n=300

4.4.2 Relational Supply Chain Governance

The participants of the study were asked to indicate the other effects of relational supply chain governance. The study established that 22.0% of the agro-processing firms in Kenya increased their trust and cooperation; 33.7% improved innovation; and 44.3% increased flexibility and adaptability as a result of relational supply chain governance respectively. The findings are presented in the Table 4.13. A notable finding is that 22.0% of firms reported increased trust and cooperation as a result of relational supply chain governance. Trust is a foundational element for effective collaboration within supply chains. Relational governance mechanisms, such as information sharing and joint problem-solving, can foster trust by reducing uncertainty and building positive expectations among partners. This improved trust likely translates into smoother collaboration, enhancing information flow and communication throughout the supply chain.

The study also revealed that 33.7% of firms attributed improved innovation to relational supply chain governance. Relational governance in the supply chain can nurture innovation by encouraging knowledge sharing and joint research efforts between firms. Increased collaboration can expose partners to new ideas and perspectives, sparking creativity and leading to the development of novel products or processes. Perhaps the most significant finding is that 44.3% of firms reported increased flexibility and adaptability due to relational supply chain governance. This agility is essential in today's dynamic business environment. Relational governance, by fostering trust and open communication, allows supply chain partners to respond

swiftly to unforeseen disruptions or market changes. Firms can collectively adapt their operations and develop contingency plans, enhancing their resilience in the face of challenges.

The findings of this study are in tandem with the findings of other scholars. Ying-Pin Yeh, (2016) established that relational SCG is positively associated with relationship quality, relational value and firm performance. Lu *et al.*, (2015) concluded that contractual SCG are effective in improving performance of construction projects in China. Dekker *et al.* (2018) stated that boundary spanner relational skills are critical in the successful management of buyer-supplier relationships and helps in avoiding high costs of more formal inter-organizational controls. According to Obi, Qiang, Dogbe & Pomegbe (2020), the relational SCG has a positive effect on supply chain performance through information sharing and quality of information. Talay and Akdeniz, (2014) pointed out that relational SCG mechanisms such as trust enhance transaction-specific investments associated with less monitoring and bargaining that improve performance. According to Ying-Pin Yeh (2016), relational SCG complements the adaptive limits of contracts by fostering the continuance of exchange and entrusting both parties with mutually agreeable outcomes.

Table 4.13: Relational Supply Chain Governance

Thematic Areas	Frequency	Percentage
Increased Trust and Cooperation	66	22.0
Improved innovation	101	33.7
Increased flexibility and Adaptability	133	44.3
Total	300	100.0

n=300

4.4.3 Transactional Supply Chain Governance

The participants of the study were asked to indicate the other effects of transactional supply chain governance. The study established that 33.0% of the agro-processing firms in Kenya improved planning and forecasting; 13.7% were able to mitigate price

fluctuations; 27.7% guaranteed supply; 10.7% reduced transaction costs and 15.0% reduced the risk of disruptions as a result of transactional supply chain governance respectively. The findings are presented in the Table 4.14. The most significant effect observed is the improvement in planning and forecasting (33.0%). This suggests that transactional supply chain governance mechanisms provide greater visibility and predictability within the supply chain, allowing firms to make more informed decisions about production, inventory management, and resource allocation.

A substantial portion of firms (27.7%) reported achieving guaranteed supply through transactional supply chain governance. This indicates a more stable flow of raw materials, reducing the risk of production stoppages and stockouts. Additionally, 15.0% of firms noted a reduced risk of disruptions, further emphasizing the role of transactional supply chain governance in building supply chain resilience. The study also revealed that transactional supply chain governance can help manage price volatility. While a smaller percentage (13.7%) of firms indicated this benefit, it suggests that transactional supply chain governance potentially facilitates strategies to mitigate the impact of fluctuating input costs within the agricultural sector. Furthermore, 10.7% of firms reported reduced transaction costs, which could be attributed to factors such as improved communication, streamlined processes, and potentially, stronger negotiating power within the supply chain.

The findings of this study agree with Dolci, Maçada and Paiva (2017) who observed that transactional SCG is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. They concluded that transactional SCG affects the operational aspects with regard to global costs and in the financial aspects of investment return in a firm. Murrell, Karalashvili and Francis (2023) established that the transactional SCG structures encourage and support the initiatives of individual employees to explore new opportunities, to develop new products, and to improve work procedures for the benefit of the organization. Williamson (1986) found out that the transactional SCG structure accounts for the actual cost of outsourcing production of products or services including transaction costs, contracting costs, coordination costs, and search costs.

Table 4.14: Transactional Supply Chain Governance

Thematic Areas	Frequency	Percentage
Improved Planning and Forecasting	99	33.0
Mitigating Price Fluctuations	41	13.7
Guaranteed Supply	83	27.7
Reduced transactional costs	32	10.7
Reduced Risk of Disruptions	45	15.0
Total	300	100.0

n=300

4.4.4 Transformational Supply Chain Governance

The participants of the study were asked to indicate the other effects of transformational supply chain governance. The study established that 22.7% of the agro-processing firms in Kenya enhanced knowledge sharing and learning; 24.7% increased investment in supply chain technology; 22.0% improved their agility; 8.3% enhanced their responsiveness; 3.3% improved their focus on sustainability and 19.0% build a stronger brand reputation as a result of transformational supply chain governance respectively. The findings are presented in the Table 4.15. A noteworthy outcome is the 22.7% increase in knowledge sharing and learning reported by the participants. This suggests that transformational supply chain governance fosters a collaborative environment, potentially through improved communication channels or knowledge management systems. This enhanced knowledge dissemination can lead to innovation, improved decision-making, and a more competent workforce. The observed 24.7% increase in investment in supply chain technology aligns with the transformative nature of transformational supply chain governance.

By embracing digital solutions, firms can enhance visibility, streamline processes, and gain real-time data for better decision-making. This investment signifies a strategic shift towards a more data-driven and agile supply chain. The findings reveal a positive impact on agility (22.0%) and responsiveness (8.3%). Transformational supply chain governance likely facilitates a more flexible and adaptable supply chain

by promoting cross-functional collaboration and risk mitigation strategies. This allows firms to respond swiftly to market fluctuations and unforeseen disruptions. Only 3.3% of participants reported an enhanced focus on sustainability. The 19.0% increase in firms reporting a stronger brand reputation is an interesting finding. This could be attributed to improved product quality and consistency achieved through a more efficient and controlled supply chain. Additionally, increased visibility into ethical sourcing practices could enhance brand image.

The results of this study are in agreement with literature reviewed. Gupta, Kumar, Kusi-Sarpong, Jabbour and Agyemang (2021) concluded that information technology is one of the enablers that organizations need to focus much in order to transform and improve their supply chain performance. They further stated that transformational SCG brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms, and managers must create an environment in which employees can accept and execute their responsibilities with confidence. The managers must communicate with their employees.

In their study, Lu, Wang and Wang (2023) found out that many companies have invested in greater supply chain digitization over the years to cope up with supply chain disruptions and to ensure performance. Pupkin (2023) noted that transformational SCG model seeks to address current challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making. According to Aben, van der Valk, Roehrich and Selviaridis (2021), there is need for comprehensive overhaul and modernization of a business's supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Dubey, Gunasekaran, Childe, Papadopoulos and Fosso-Wamba, (2017) found out that transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms.

Table 4.15: Transformational Supply Chain Governance

Thematic Areas	Frequency	Percentage
Enhanced knowledge sharing and learning	68	22.7
Increased investment in supply chain technology	74	24.7
Improved agility	66	22.0
Increased responsiveness	25	8.3
Improved focus on sustainability	10	3.3
Stronger brand reputation	57	19.0
Total	300	100.0

n=300

4.4.5 Moderating Effects of Information Flow

The participants of the study were asked to indicate the other moderating effects of information flow on supply chain governance and performance of agro-processing firms. The study established that 40.3% of the agro-processing firms in Kenya enhanced contractual effectiveness; 24.7% improved monitoring and enforcement; and 35.0% improved demand forecasting and planning as a result of information flow respectively. The findings are presented in the Table 4.16. The findings convincingly demonstrate that information flow plays a significant role in enhancing various aspects of these domains. Among the investigated moderating effects, information flow exerts the strongest influence on contractual effectiveness.

Notably, 40.3% of the participating firms reported enhanced effectiveness attributed to improved information flow. This suggests that clear and timely information sharing strengthens contractual arrangements within the supply chain, potentially by reducing misunderstandings, fostering trust, and facilitating better coordination between actors. The study also reveals positive influences of information flow on monitoring and enforcement (24.7% of firms) and demand forecasting and planning (35.0% of firms). Efficient information flow empowers improved monitoring practices by enabling better visibility into supply chain activities. This can lead to more effective enforcement of contractual terms and adherence to quality standards.

Additionally, information flow facilitates data-driven forecasting and planning, allowing firms to make more informed decisions regarding inventory management and production scheduling.

The findings of this study are in line with other researchers. According to Wardaya, *et al.* (2013), information flow is an important element that reflects collaboration within the supply chain management and firm performance. According to Obi, Qiang, Dogbe and Pomegbe (2020), the relational SCG has an indirect effect on supply chain performance through information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational SCG on supply chain performance. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making.

Durugbo *et al.* (2013) noted that data stream must be effective when firms need data for innovation use to consistently meet the changing client tastes. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution. According to Anupam and Fedorowicz (2015), inventory network execution requires chain exercises composed under an exceptionally incorporated data sharing condition. Sharing data helps in lessening slack, stockouts, wellbeing stocks and stock dimensions among others.

Wardaya, *et al.*, (2013) affirmed that data stream had turned into a significant component that reflected joint effort inside the store network the executives and firm execution. Sharing of data is important on exchange; trade of data showing the dimension and position of stock; deals information and data on the gauging; data about the status of requests, generation calendars and conveyance limit, and firm execution measures had turned out to be basic to all organizations. Bardaki *et al.* (2011) stated that effective combination of data inside an association is a ground

breaking empowering agent for decreased costs, expanded profitability and improved client administration.

Table 4.16: Information Flow

Thematic Areas	Frequency	Percentage
Enhanced contractual effectiveness	121	40.3
Improved monitoring and enforcement	74	24.7
Improved demand forecasting and planning	105	35.0
Total	300	100.0

4.4.6 Performance of Agro Processing Firms

The participants of the study were asked to indicate the other measures of performance utilized by the agro-processing firms. The study established that 17.3% of the agro-processing firms in Kenya embraced capacity utilization; 24.0% compliance with food safety standards; 13.3% customer complaints; 9.3% customer retention rate; 4.3% customer satisfaction; 28.0% lead time and 3.7% waste reduction respectively. The findings are presented in the Table 4.17. This data offers a fascinating glimpse into the performance metrics prioritized by Kenyan agro-processing firms. The most prominent indicator, capacity utilization (17.3%), suggests a strong emphasis on maximizing production output. This aligns with a focus on efficiency and economies of scale, potentially reflecting a competitive market environment. Interestingly, lead time (28.0%) also features prominently, indicating a potential concern with optimizing production flow and reducing bottlenecks.

Food safety standards garner significant attention (24.0%), unsurprisingly. Prioritizing adherence to regulations demonstrates a commitment to consumer health and potentially positions these firms for export opportunities. The relatively low emphasis on customer satisfaction (4.3%) and customer retention rate (9.3%) invites further exploration. Perhaps these firms operate primarily in business-to-business

(B2B) markets, where long-term relationships and brand loyalty hold less sway. Alternatively, it might suggest a need to invest in customer relationship management (CRM) strategies to enhance brand perception and foster customer loyalty. The inclusion of waste reduction (3.7%) is an encouraging sign, hinting at a nascent environmental awareness within the industry. However, this metric's low ranking suggests further optimization efforts might be beneficial, potentially leading to cost savings and improved resource management.

This is in tandem with the findings of Mwaura and Okeyo (2020), who concluded that return on equity, customer satisfaction and employee satisfaction, measure the performance of large manufacturing in Kenya. This in agreement with Wamiori, Namusonge and Sakwa (2019), who observed that financial performance of manufacturing firms in Kenya, is measured through return on assets and profitability. The findings are in tandem with Kiriinya, Ngugi and Mwangangi (2021), who observed that customer satisfaction plays a big role in measuring the performance of pharmaceutical firms in Kenya. The findings of this study compare well with those by Mwangi, *et al.*, (2019), who established that the performance of manufacturing firms in Kenya is measured in terms of return on equity. Kyengo, Muathe & Kinyua (2019) observed that customer retention indicates performance of food processing firms in Kenya.

Nielson (2013) asserted that there are two types of performance reports, which are service and cost performance reports. The findings are in tandem with those of Selvam, *et al.*, (2016), who found that the performance of a firm is a multi-dimensional construct that is measured with the customer satisfaction. According to Pokryshevskaya and Antipov (2017), customer satisfaction is a key performance indicator within business and is often part of a Balanced Scorecard, and provides a leading indicator of consumer purchase intentions and loyalty. The result was in tandem with Shimenga and Miroga (2019), who observed that financial leveraging positively influences financial performance of manufacturing firms in Kenya and manufacturing firms with effective financial leveraging mechanisms could realize an increase in their profitability.

This finding is in line with Bor, Ngugi and Odhiambo (2021), who observed that product quality and cost management, measures the performance of food and beverage processing sector in Kenya. This is in line with Nimpano, Shalle and Mulyungi (2021), who concluded that customer satisfaction and quality measure performance of agri-manufacturing firms in Rwanda. The results agreed with those by Dawal *et al.*, (2015) who postulated that financial and cost indicators should be complemented by non-financial measures related to quality of products, delivery and flexibility and be integrated with management’s strategic objectives. According to Dekker *et al.* (2018), performance indicators in agro-food supply chains are efficiency, flexibility, responsiveness and food quality. Osoro *et al.* (2016) used right quality, right quantity, right source and timeliness to measure performance of supply chain systems in the petroleum industry in Kenya.

Table 4.17: Performance of Agro Processing Firms

Thematic Areas	Frequency	Percentage
Capacity utilization	52	17.3
Compliance with food safety standards	72	24.0
Customer complaints	40	13.3
Customer retention rate	28	9.3
Customer satisfaction	13	4.3
Lead time	84	28.0
Waste reduction	11	3.7
Total	300	100.0

4.4.6.1 Profitability

The study compared the profitability turnover for the entire manufacturing firms and the agro-processing firms. From the findings on Figure 4.1, it was established that the profitability for the agro-processing firms was decreasing from Kshs 4.3 million in 2023 to Kshs.2.9 million in 2023. During the same period, the entire manufacturing firms had increased its sales from Kshs.4.3 million in 2023 to

Kshs.2.5 million in 2023. Between 2023 and 2023, the agro-processing sub-sector had their total profitability reduce from Kshs. 4.3 million to Kshs.2.5 million, while the entire manufacturing firms had recorded an increase in profitability turnover from Kshs.4.8 million to 2.7 million in 2023. A further decline was recorded in the agro-processing sub-sector to Kshs.2.3 million in 2023, whereas the entire sector grew their sales profit to Kshs.3.5 million. This signifies that the agro-processing firms have been recording a decline in their profitability, despite the entire manufacturing sector growing as far as profitability is concerned.

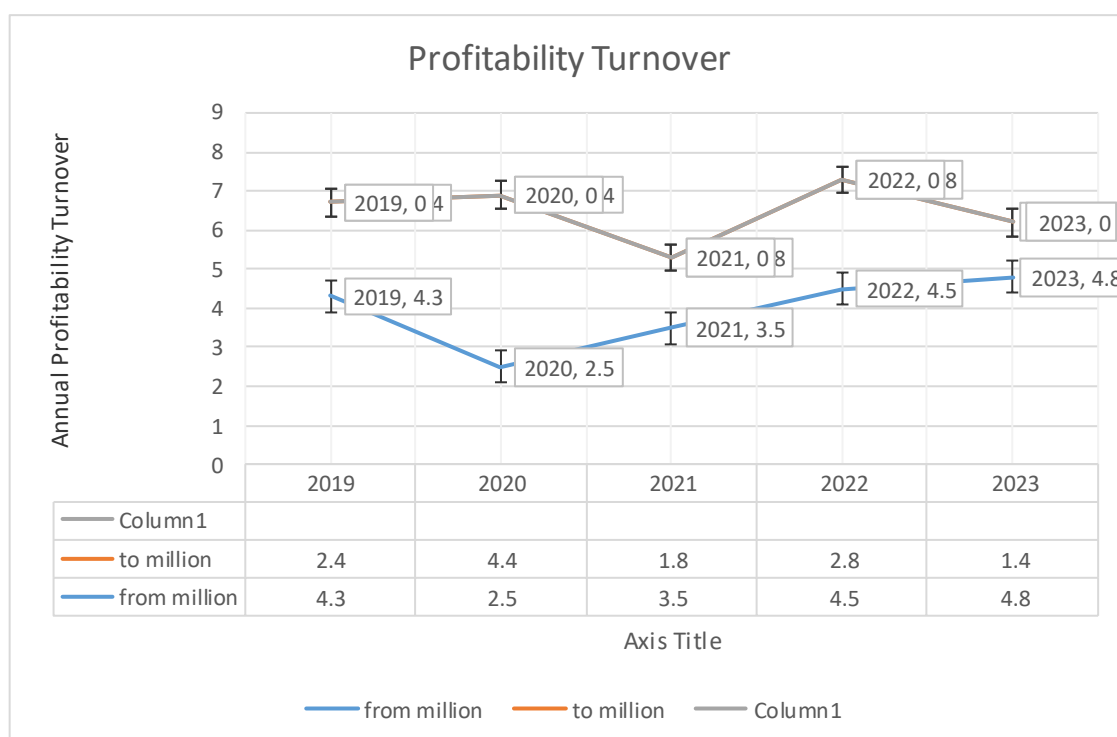


Figure 4.1: Annual profitability Turnover

4.4.6.2 Sales growth

The research assessed the sales growth of the firms and results presented in Figure 4.2. The findings show that the average sales growth in the firms have been decreasing in a fluctuating way for the five consecutive years. The sales growth

represents the total percentage of sales that result in a profit. Further, the sales growth gives the measure of a firm earnings (or profits) relative to its revenue (Grabs, 2020).

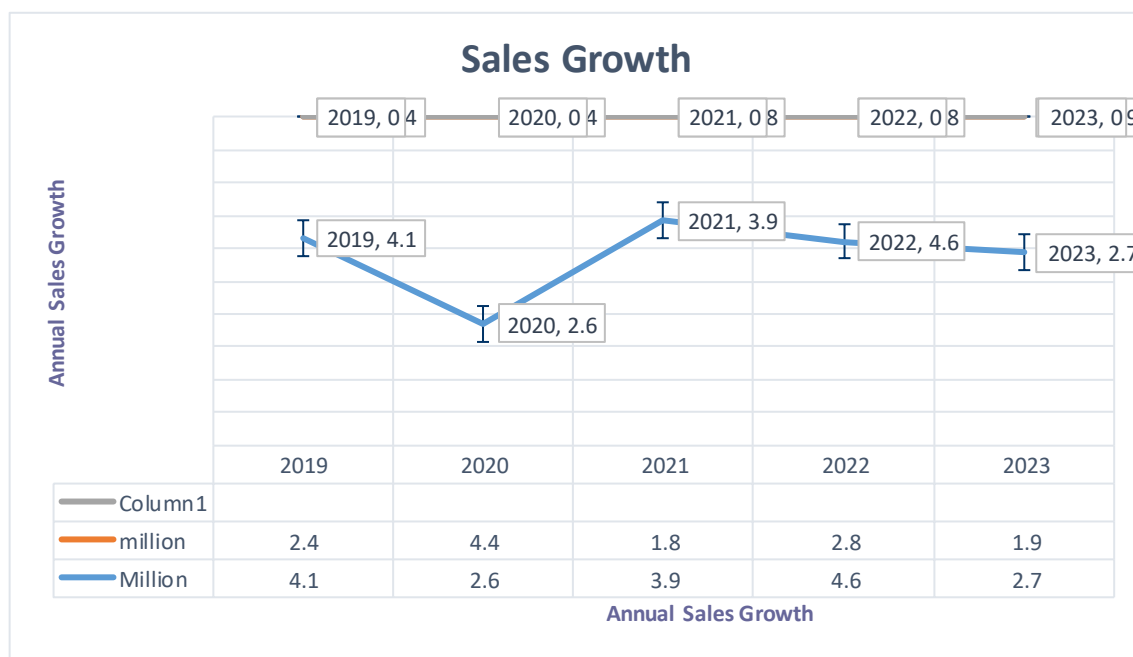


Figure 4.2: Annual Sales Growth

4.4.6.3 Market share

On the level of market share, it was established that the entire manufacturing firms had a quantum index of 6.7% in 2023 while the agro-processing firms had a 10.2%, in 2023. The entire sector declined to 3.0% while the agro-processing firms had their production decline to negative 0.20%. In 2023, the agro-processing sub-sector increased its production to 56% but declined to 3.0% in 2023, while in the same period (2023), the entire manufacturing sector had its market share grow to 6.5%. The agro-processing firms further recorded a decline of 1.1% in market share in 2023, while the entire sector had a production index of 3.8%. From the results, it can be deduced that as much as the entire manufacturing sector is facing decline in production, the food and beverage sub-sector has more decline in production,

implying that the sector is indeed ailing (KEBS, 2023). This outcome concurs with the finding of Ongeru and Osoro (2021) as per figure 4.3.

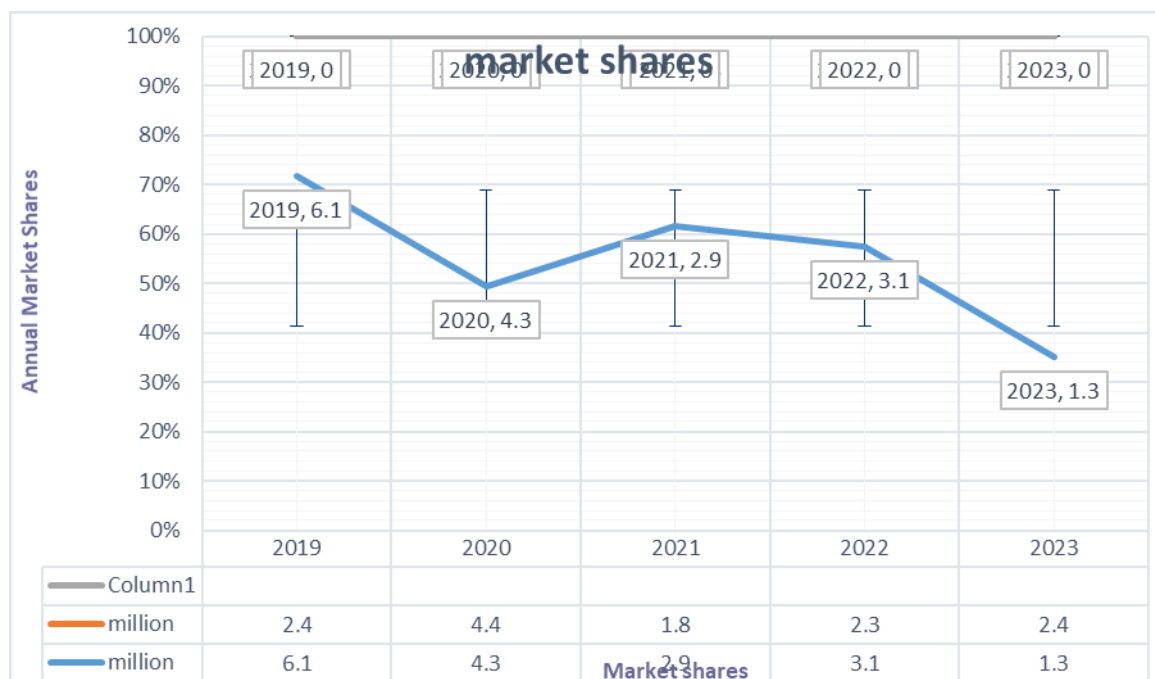


Figure 4.3: Market Share for the Agro-processing Firms

4.5 Diagnostic Tests

The study conducted diagnostic tests that included normality test, homoscedasticity test, multicollinearity test, linearity test, heteroscedasticity test and autocorrelation test. The tests were conducted to establish whether the data collected was accurate, reliable and capable of inferring the study results to the target population.

4.5.1 Normality Test

Normality test is performed for outliers within the constructs and drop the ones identified. Outliers are observations showing characteristics or values that are markedly different from the majority of cases in a data set and should be dropped (Sarstedt & Mooi, 2019). This is because outliers distort the true relationship between variables, by either creating a correlation that should not exist or suppressing a correlation that should exist. Normality test was done using

Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test is used to test the null hypothesis that a set of data comes from a normal distribution (Ghasemi, & Zahediasl, 2012). The Kolmogorov Smirnov test produced test statistics that were used along with a degree of freedom parameter to test for normality. For a linear regression, it is assumed that the error term (residuals) has to be normally distributed. This test sought to find out the normal distribution for the responses in the study (Mishra, Luo, Hazen, Hassini, & Foropon, 2019).

The study conducted normality test at 95% confidence interval for the mean, where the p-value was compared to determine whether data was either normally distributed (greater than 0.05) or not normally distributed (less than 0.05). As indicated in Table 4.18, the p-value for the test was 0.200 that is greater than 0.05 thus, concluded that the residuals were normally distributed and the assumption of normality was satisfied. This finding was in agreement with Lewis-Beck and Lewis-Beck (2015), who observed that the data is normally distributed when the p-value is greater than 0.05. The result is also in tandem with Perez and Kibria (2020), who observed that the data is normally distributed when the p-value is greater than 0.05.

Table 4.18: Tests of Normality

Kolmogorov-Smirnov^a		
Statistic	df	Sig.
.082	299	.200

4.5.2 Homoscedasticity Test

Homoscedasticity refers to constancy of variance. For any linear regression analysis, the error terms are assumed the same across all values of the independent variables (Leavy, 2017). This was achieved through plotting a residual scatter plot for predicted scores and standardized residual values also known as errors of prediction. This assumption is met if the scores are randomly scattered about a horizontal line.

According to the findings in Figure 4.4, the scores appeared to be randomly scattered. This indicated that the homoscedasticity assumption was not violated.

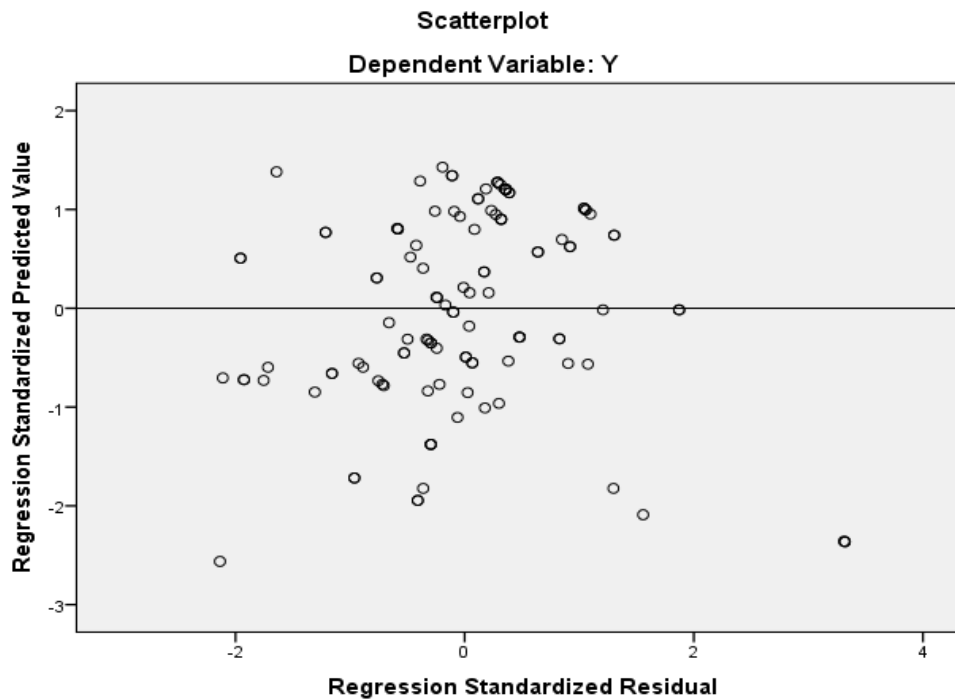


Figure 4.4: A Scatter Plot of Standardized Predicted Values against Standardized Residuals

4.5.3 Multicollinearity Test

In parametric tests, it is assumed that independent variables should not be highly correlated meaning that multicollinearity should not exist (Park, 2018). According to Sekaran (2015), multicollinearity is a phenomenon in which one predictor variable in a multiple regression model can be linearly predicted from the others with a substantial degree of accuracy. Multicollinearity generally occurs when there are high correlations between two or more predictor variables, and one predictor variable predicts the other. Multicollinearity is the undesirable situation where the correlations among the independent variables are very strong. When multicollinearity is present in the data, the statistical inferences made about the data may not be reliable. Therefore, the correlations among the independent variables should be weak for suitability of multiple regression (Perez, & Kibria, 2020). Multicollinearity was

tested to establish the possibility of the predictor variables having some explanatory power over each other.

The study sought to find out the collinearity among the independent (predictor) variables: contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance. Variance Inflation Factor (VIF) and tolerance statistics of the predictor constructs were used for the multicollinearity test. Multicollinearity is associated with VIF above 5 and a tolerance with value below 0.2. A VIF value less than 5 indicates non-existence of multicollinearity while a VIF of more than 5 indicates existence of multicollinearity. All the variables had VIF values of less than 5 implying that there was no multicollinearity among the variables. This finding is in line with Park (2018), who observed that multicollinearity can also be detected with the help of tolerance and its reciprocal, called variance inflation factor (VIF). According to Gujarati and Porter (2012), the VIF of independent construct that exceed 10 as a rule of thumb is regarded as collinear.

Tolerance refers to the total allowable error within an item. This is typically represented as a +/- value off of a nominal specification. Tolerance can be defined as the total allowable amount by which a measurement may vary. It is the difference between the maximum and minimum limits. The tolerance value more than 0.2 indicates non-existence of multicollinearity while a tolerance value of less than 0.2 indicates existence of multicollinearity. All the variables had tolerance values of more than 0.2 implying that there was no multicollinearity among the variables. The research findings in Table 4.19 revealed that there was no good evidence for presence of multicollinearity problem in this study and hence acceptable for collection and analysis. Collinearity is a linear relationship between two explanatory variables. Two variables are perfectly collinear if there is an exact linear relationship between the two. This is in line with the findings of Heale and Twycross (2017) who observed that formal detection-tolerance and the variance inflation factor (VIF) are used to test multicollinearity.

When there is high multicollinearity, the confidence intervals of the coefficients tend to become very wide and the statistics tend to be very small. This makes it very difficult to reject the null hypothesis of any study when multicollinearity is present in the data under study. Multicollinearity makes it tedious to assess the relative importance of the independent variables in explaining the variation caused by the dependent variable. This is in consistent with the findings of Creswell and Creswell (2017), who contended, that it's better drop one of the variables. An explanatory variable may be dropped to produce a model with significant coefficients and obtain more data if possible. The action is the most preferred solution and more data can produce more precise parameter estimates.

Table 4.19: Multicollinearity Test

Variable	VIF	Tolerance Value
Contractual supply chain governance	1.458	0.686
Relational supply chain governance	1.799	0.556
Transactional supply chain governance	2.257	0.443
Transformational supply chain governance	2.178	0.459

4.5.4 Linearity Test

Linearity was tested using the ANOVA test of linearity that computes both the linear and non-linear components of a variable duo where non-linearity is significant if the p-value significance for non-linear component is below 0.05. To test for linearity, the null hypothesis of the test is that there is a linear relationship between two variables and the alternative is that there is no linear relationship between the two variables. As indicated in Table 4.20, all computed the p-values were more than 0.05 confirming linear relationships (constant slope) between the dependent variable and each independent variable.

Table 4.20: Linearity Test

Variables	P-Value
Y- X₁	0.178
Y- X₂	0.188
Y- X₃	0.441
Y- X₄	0.437
Y- X₅	0.837

4.5.5 Heteroscedasticity Test

According to Sekaran (2015), one of the problems commonly encountered in cross-sectional data is heteroscedasticity (unequal variance) in the error term. There are various reasons for heteroscedasticity, such as the presence of outliers in the data, or incorrect functional form of the regression model, or incorrect transformation of data, or mixing observations with different measures of scale. Heteroscedasticity in regression analysis occurs when the variance of the residuals (errors) varies across the observations. Heteroscedasticity such as the violation of homoscedasticity is present when the size of the error term differs across values of an independent variable. This is in agreement with the findings of Heale and Twycross (2017), who observed that a more serious problem associated with heteroscedasticity is the fact that the standard errors are biased. When the standard error is central to conducting significance tests and calculating confidence intervals, biased standard errors lead to incorrect conclusions about the significance of the regression coefficients.

Heteroscedasticity is a major concern in the application of regression analysis even in the analysis of variance for it can invalidate statistical tests of significance that assume that the modeling errors are uncorrelated and uniform. It occurs when there is a large difference among the sizes of the observations. Heteroscedasticity is the absence of homoscedasticity. This study used Breush-Pagan to test null hypothesis that the errors have equal variance (errors are homoscedastic) versus the alternative hypothesis that errors are heteroscedastic as recommended by Melanie & Eriikka

(2015). The Breush-Pagan test gives a chi-square value and a significance value where a p-value less than 0.05 indicates that there is heteroscedasticity, while a p-value greater than 0.05 indicates that heteroscedasticity does not exist. As indicated in the Table 4.21, the p-value is greater than 0.05, which implies that the heteroscedasticity does not exist in this study. This is in agreement with the findings of Creswell and Creswell (2017), who observed that existence of heteroscedasticity is a major concern in the application of regression analysis and the analysis of variance.

Table 4.21: Heteroscedasticity Test

Breusch-Pagan Test for Heteroscedasticity		
Chi-Square	df	Sig.
2.506	1	.113

4.5.6 Autocorrelation Test

This study used the Durbin Watson test to detect the presence of autocorrelation. Durbin Watson (DW) is a test for first order of autocorrelation that tests only for a relationship between an error and its previous value. Autocorrelation or serial correlation is the similarity of a time series over successive time intervals. Autocorrelation is defined as the correlation of a variable with itself over successive observations. It often exists when the order of observations matters, the typical scenario of which is when the same variable is measured on the same participant repeatedly over time (Leavy, 2017). It can lead to underestimates of the standard error and can cause the belief that the predictors are significant when they are not. It is a characteristic of data in which the correlation between the values of the same variables is based on related objects (Park, 2018). This is in tandem with the findings of Heale and Twycross (2017), who established that autocorrelation test was made by using Durbin and Watson (1951).

Autocorrelation is mainly considered in multiple regression model that is designed for independent observations, where the existence of autocorrelation is undesirable. Autocorrelation violates the assumption of instance independence, which underlies most of the conventional models. A value of 2.0 or more means there is no autocorrelation detected in the sample. While values from zero to 2.0 indicate positive autocorrelation and values from 2.0 to 4.0 indicate negative autocorrelation. Since the Durbin Watson value is between 1.5 and 2.5 as shown in Table 4.22, then it is concluded that there is no autocorrelation between the residual. Where autocorrelation occurs for scores on the dependent variable in ordinary least square (OLS) regression, then the regression residuals will also be auto-correlated, creating a systematic bias in estimates of the residuals and statistics derived from them.

Table 4.22: Autocorrelation Test

Model	Durbin-Watson
1	2.108

4.6 Inferential Analysis

Inferential statistical analysis involves objectively and quantitatively summarizing the data, determining which data patterns are significant, and making inferential statements about system performance (Sarstedt & Mooi, 2019). It fit statistical models to data and test significance of data patterns. The aim of inferential statistics is to discover some property or general pattern about a large group by studying a smaller group of people in the hopes that the results will generalize to the larger group (Grekousis, 2020). Inferential statistics takes data from a sample and makes inferences about the larger population from which the sample was drawn.

The two general categories of statistics are used in inferential studies, that is, parametric and nonparametric tests. Both of these types of analyses are used to determine whether the results are likely to be due to chance or to the variable(s) under study (Creswell & Creswell, 2017). The correlation analysis and regression analysis were conducted under inferential analysis in this study. The Pearson correlation analysis was applied to examine the degree of the relationship of the

variables against each other. The regression analysis was used to determine the nature of the relationship and the contribution of each independent variable in explaining the dependent variable as well as test the hypothesis of the study. The level of significance was tested at 5%.

4.6.1 Correlation Analysis of the Variables

According to Derrick and White (2017), a correlation technique is to analyse the degree of relationship between two variables. Correlation refers to the strength of a relationship between two variables. The correlation coefficient is a measure that determines the degree to which the movement of two different variables is associated. The most common correlation coefficient, generated by the Pearson product-moment correlation, is used to measure the linear relationship between two variables. The strong correlation means that two or more variables have a strong relationship with each other, but a weak correlation means that the variables are not related. Correlation coefficient ranges from -1.00 to +1.00. When correlation coefficient value is -1.00, then it means there is a perfect negative correlation while a value of +1.00 represents a perfect positive correlation. This statistic is called a correlation coefficient (r) which indicates the relationship between the two and the bigger the correlation the stronger the coefficient between the two variables being compared (Heale & Twycross, 2017).

According to Leavy (2017), a correlation coefficient value of 0.00 means that there is no relationship between the variables being tested. The direction of the relationship is important in that if it is positive (+), it means that there is a positive relationship between the two variables. This implies that when one variable increase or decrease, then other variables or one variable also increases or decreases. This is in tandem with the findings of Park (2018), who observed that a negative relationship means that as one variable decreases, the other variable increases and vice versa and hence an inverse (opposite or contrary) relationship. The score of 1 indicates a perfect correlation that is found only when a variable is correlated with itself, while the score of 0 indicates no correlation at all (Cantos, 2019).

The study used the Karl Pearson's Correlation coefficient (r) also referred to as linear or product moment correlation. Correlations were done using a 2-tailed test, setting the significance value at 0.05. The values smaller than the significant value (0.05) were deemed as significant while those greater than 0.05 were deemed insignificant. Karl Pearson's correlation reflects the degree of linear relationships between two variables. The correlation coefficient ranges from -1.0 to +1.0 and the closer the coefficient is to +1 or -1, the more closely the two variables are related. Sarstedt and Mooi (2019) observed that a correlation of +1 means there is a perfect positive linear relationship between variables.

The findings in Table 4.23 indicate that all the variables: contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance, informational flow and performance of agro processing firms, had p-values less than the standard p-values of less than 0.05 thus implying that all the variables were correlated hence approving the model. According to Denzin (2017), when the correlation of each independent variable with the other is significant, it implies that the variables measure a different aspect from each other hence the model can be reliable to deliver the projected results.

The findings indicated that transactional supply chain governance had the strongest correlation with performance as shown by the Pearson Correlation coefficient of 0.774. The second one was relational supply chain governance with a Pearson Correlation coefficient of 0.718, followed by contractual supply chain governance with a Pearson Correlation coefficient of 0.698, followed by transformational supply chain governance with a Pearson correlation coefficient of 0.673 and finally the information flow with a Pearson Correlation coefficient of 0.582.

The findings showed that transactional supply chain governance has more impact on the performance of agro processing firms then followed by relational supply chain governance. The findings further revealed that information flow has the impact on the performance of agro processing companies. The findings are in tandem with Obi, Qiang, Dogbe and Pomegbe (2020), who observed that the relational governance has

a positive effect on supply chain performance and at the same time has an indirect effect on supply chain performance through both information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance.

Table 4.23: Correlation Analysis

		Y	X ₁	X ₂	X ₃	X ₄	Z
X ₁	Pearson	.698**	1				
	Correlation						
	Sig. (2-tailed)	0.000					
X ₂	Pearson	.718**	.583**	1			
	Correlation						
	Sig. (2-tailed)	0.000	0.000				
X ₃	Pearson	.774**	.624**	.584**	1		
	Correlation						
	Sig. (2-tailed)	0.000	0.000	0.000			
X ₄	Pearson	.673**	.648**	.608**	.683**	1	
	Correlation						
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
Z	Pearson	.582**	.371**	.708**	.506**	.669**	1
	Correlation						
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	

Where X₁ = contractual supply chain governance, X₂ = relational supply chain governance, X₃ = transactional supply chain governance, X₄ = transformational supply chain governance, Z = informational flow and Y= performance of agro processing firms.

4.6.2 Simple Linear Regression Findings

The purpose of hypothesis testing is to determine the accuracy of the study hypotheses because the researcher has collected a sample of data. In hypothesis, testing the main question is whether to accept the null hypothesis or not to accept the null hypothesis (Denzin, 2017). The hypothesis test specifies which outcomes of a study may lead to a rejection of the null hypothesis at a pre-specified level of significance, while using a pre-chosen measure of deviation from that hypothesis (the test statistic, or goodness-of-fit measure). The pre-chosen level of significance is the

maximal allowed (false positive rate). One wants to control the risk of incorrectly rejecting a true null hypothesis. A statistical hypothesis test is a method of statistical inference, which is the process of using data analysis to infer properties of an underlying distribution of probability (Se Yoon, 2021).

4.6.2.1 Regression Analysis of the Effect of Contractual Supply Chain Governance on Performance of Agro Processing Firms in Kenya

The first objective of the study was designed to establish the effect of contractual supply chain governance on performance of agro processing firms in Kenya. The literature that was reviewed in this study as well as theoretical reasoning associated contractual supply chain governance with performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₁: Contractual supply chain governance does not significantly affect the performance of agro processing firms in Kenya.

The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. The model summary in Table 4.24 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.486 implying that 48.6% of performance of agro processing firms in Kenya is explained by contractual supply chain governance. The findings were further supported by p-value of 0.21943. Therefore, the null hypothesis of contractual supply chain governance does not significantly influence firm performance was rejected and the researcher considered the alternative hypothesis. The alternative hypothesis was that contractual supply chain governance have a significant influence on performance of agro processing firms in Kenya. Regression indicates the strength of the relationship between the independent variable and the dependent variable (performance).

This is in tandem with the findings of Park (2018), who observed that when the Adjusted R square value indicates a strong relationship between the independent

variable and the dependent variable, then the null hypothesis is rejected and alternative hypothesis is considered. This indicates that the independent variable shares a variation of 48.6% of performance. The finding implies that if all the agro processing firms can implement contractual supply chain governance, then performance of the firms will be enhanced and leads to high productivity and efficiency. This is in tandem with the findings of Cao and Lumineau (2015), who established that contractual supply chain governance enhances performance of firms. The finding tally with that of Hong, *et al.*, (2015), who observed that contractual supply chain governance, has a positive effect on supply chain performance of construction projects.

This is in line with the findings of Zhang *et al.* (2016), who found that the contractual supply chain governance is the process of systematically, and efficiently managing contract creation, execution, and analysis for the purpose of maximizing financial and operational performance and minimizing risk of the firms. This is agreement with the results of Lu, *et al.* (2015), who observed that the contractual supply chain governance is effective in improving project performance in construction projects in China. The same finding is in tandem with that of Addae-Boateng *et al.* (2015), who established that contractual supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms.

Table 4.24: Model Summary for Contractual Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.698 ^a	0.487	0.486		0.21943

a. Predictor: (Constant), Contractual supply chain governance

b. Dependent Variable: Performance of agro processing firms

4.6.2.1.1 ANOVA for Contractual Supply Chain Governance and Performance of Agro Processing Firms in Kenya

In Table 4.25, the ANOVA was used to show the overall model significance. Since the p-value is less than 0.05, then contractual supply chain governance had a significant explanatory power on performance of agro processing firms ($F=283.287$ and $p\text{-value} < 0.05$). The ANOVA test shows that there is significance. This implies that the null hypothesis is rejected and the alternative hypothesis is taken to hold implying that the model is significantly fit. There is a positive linear relationship between contractual supply chain governance and performance of agro processing firms in Kenya. The finding is in agreement with that of Zhang, *et al.* (2016), who established that the contractual supply chain governance is the process of systematically, and efficiently managing contract creation, execution, and analysis for the purpose of maximizing financial and operational performance and minimizing risk of the firms.

The finding also compares well with Cao and Lumineau (2015), who established that contractual supply chain governance enhances performance of firms. This is in agreement with the results of Lu, *et al.* (2015), who observed that the contractual supply chain governance is effective in improving project performance in construction projects in China. The same finding is in tandem with that of Addae-Boateng *et al.* (2015), who established that contractual supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms. The finding tally with that of Hong, *et al.*, (2015), who observed that contractual supply chain governance has a positive effect on supply chain performance of construction projects. The finding is in tandem with Benítez-Ávila, *et al.* (2018), who concluded that contractual supply chain governance improves public-private partnerships in Netherlands.

Table 4.25: ANOVA Table for Contractual Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.640	1	13.640	283.287	.000 ^b
	Residual	14.348	298	0.048		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Contractual supply chain governance

4.6.2.1.2 Regression Coefficients for Contractual Supply Chain Governance and Performance of Agro processing Firms in Kenya

From Table 4.26, regression equation can be written as:

$$Y = 2.212 + 0.508X_1$$

Where:

X_1 is contractual supply chain governance

Y is performance of agro processing firms in Kenya

The regression equation above shows that when contractual supply chain governance is held constant at zero, performance of agro processing firms would be 2.212 units. There is an influence of contractual supply chain governance on performance of agro processing firms in Kenya. A unit increase in contractual supply chain governance increases performance of agro processing firms by 0.508 Units. Since the p-value is less than 0.05 we conclude that there is a significant influence of contractual supply chain governance on performance of agro processing firms in Kenya. The finding is in agreement with that of Zhang *et al.* (2016), who established that the contractual supply chain governance is the process of systematically and efficiently managing contract creation, execution, and analysis for the purpose of maximizing financial and operational performance and minimizing risk of the firms.

The finding also compares well with Cao and Lumineau (2015), who established that contractual supply chain governance enhances the performance of firms. This is agreement with the results of Lu *et al.* (2015), who observed that the contractual supply chain governance is effective in improving project performance in construction projects in China. The finding tally with that of Hong *et al.* (2015), who observed that contractual supply chain governance has a positive effect on supply chain performance of construction projects. The same finding is in tandem with that of Addae-Boateng *et al.* (2015), who established that contractual supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms. The finding is in tandem with Benítez-Ávila *et al.* (2018), who concluded that contractual supply chain governance improves public-private partnerships in Netherlands.

Table 4.26: Regression Coefficients Table for Contractual Supply Chain Governance and Performance of Agro processing Firms in Kenya

Model		Unstandardized		Standardized		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	2.212	0.134		16.455	0.000
	X ₁	0.508	0.030	0.698	16.831	0.000

a. Dependent Variable: Performance of Agro Processing Firms

b. Predictor: Contractual supply chain governance

4.6.2.2 Regression Analysis of the Effect of Relational Supply Chain Governance on Performance of Agro Processing Firms in Kenya

The second objective of the study was designed to establish the effect of relational supply chain governance on performance of agro processing firms in Kenya. The literature that was reviewed in this study as well as theoretical reasoning associated

relational supply chain governance with performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₂: Relational supply chain governance does not significantly affect the performance of agro processing firms in Kenya.

The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. The model summary in Table 4.27 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.514 implying that 51.4% performance of agro processing firms in Kenya is explained by relational supply chain governance. The researcher rejected the null hypothesis and considered the alternative hypothesis as relational supply chain governance has significant influence on performance of agro processing firms in Kenya. Regression indicates the strength of the relationship between the independent variable and the dependent variable (performance). This is in agreement with the findings of Armstrong (2019), who observed that where the Adjusted R square value indicates a strong relationship between the independent variable and the dependent variable, then the null hypothesis is rejected and alternative hypothesis is considered.

This finding is in agreement with that of Dekker *et al.* (2018), who established that relational supply chain governance skills are critical in the successful management of buyer-supplier relationships and help in avoiding high costs of more formal inter-organizational controls leading to performance of firms. It is in line with the finding of Dong *et al.* (2017), who observed that the relational supply chain governance improves the buyer and supplier relationships to be more flexible than written contracts in enhancing the performance of China firms. The findings agree with of Lu *et al.* (2015), who concluded in their study that relational supply chain governance is effective in improving performance of construction projects in China. The finding is in tandem with Benítez-Ávila *et al.* (2018), who concluded that

relational supply chain governance improves public-private partnerships in Netherlands.

The result is in tandem with Ying-Pin Yeh (2016) and Huang and Chiu (2018), who observed that relational supply chain governance is positively associated with relationship quality, relational value and firm performance. This finding that relational supply chain governance effects the performance of agro processing firms in is in line with Addae-Boateng *et al.* (2015), who established that relational supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms. It is also in agreement with the finding of Cao and Lumineau, (2015), who observed that relational supply chain governance structures assist on performance of China firms. According to Obi *et al.* (2020), the relational governance has a positive effect on supply chain performance of manufacturing firms in Ghana.

Table 4.27: Model Summary for Relational Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.718 ^a	0.515	0.514	0.21336

a. Predictor: (Constant), Relational supply chain governance

b. Dependable Variable: Performance of agro processing firms

4.6.2.2.1 ANOVA for Relational Supply Chain Governance and Performance of Agro Processing Firms in Kenya

In Table 4.28, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. Since the p-value is less than 0.05, then relational supply chain governance had a significant

explanatory power on performance of agro processing firms ($F=316.850$ and $p\text{-value} < 0.05$). The finding was further supported by $p\text{-value}$ of 0.000 . The researcher rejected the null hypothesis stating that relational supply chain governance does not influence performance of agro processing firms in Kenya, and considered the alternative hypothesis since the relational supply chain governance has significant influence on performance of agro processing firms in Kenya.

This finding is in agreement with that of Dekker *et al.* (2018), who established that relational supply chain governance skills are critical in the successful management of buyer-supplier relationships and help in avoiding high costs of more formal inter-organizational controls leading to performance of firms. It is in line with the finding of Dong *et al.* (2017), who observed that the relational supply chain governance improves the buyer and supplier relationships to be more flexible than written contracts in enhancing the performance of China firms. The finding agrees with of Lu *et al.* (2015), who concluded in their study that relational supply chain governance is effective in improving performance of construction projects in China.

The result is in tandem with Ying-Pin Yeh (2016), who observed that relational supply chain governance is positively associated with relationship quality, relational value and firm performance. This finding that relational supply chain governance effects the performance of agro processing firms in is in line with Addae-Boateng *et al.* (2015), who established that relational supply chain governance is a corporate governance structure used to manage the relationships between parties to a transaction and reduce opportunism to enhance performance of Chinese and Ghanaian firms. It is also in agreement with the finding of Cao and Lumineau, (2015), who observed that relational supply chain governance structures assist on performance of China firms. The result is in line with According to Obi *et al.* (2020), who concluded that the relational governance has a positive effect on supply chain performance of manufacturing firms in Ghana.

Table 4.28: ANOVA Table for Relational Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.423	1	14.423	316.850	.000 ^b
	Residual	13.565	298	0.046		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Relational supply chain governance

4.6.2.3 Regression Analysis of the Effect of Transactional Supply Chain Governance on Performance of Agro Processing Firms in Kenya

The third objective of the study was designed to establish the effect of transactional supply chain governance on performance of agro processing firms in Kenya. The literature that was reviewed in this study as well as theoretical reasoning associated transactional supply chain governance with performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₃: Transactional supply chain governance does not significantly affect the performance of agro processing firms in Kenya.

The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. The model summary in Table 4.29 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.597 implying that 59.7% performance of agro processing firms in Kenya is explained by transactional supply chain governance. The researcher rejected the null hypothesis stating that transactional supply chain does not affect the performance of agro processing firms in Kenya. The researcher

considered the alternative hypothesis since the transactional supply chain governance has significant effect on performance of agro processing firms in Kenya.

The findings of this study agree with Dolci, Maçada and Paiva (2017) who observed that transactional SCG is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. They concluded that transactional SCG affects the operational aspects with regard to global costs and in the financial aspects of investment return in a firm. Murrell, Karalashvili and Francis (2023) established that the transactional SCG structures encourage and support the initiatives of individual employees to explore new opportunities, to develop new products, and to improve work procedures for the benefit of the organization. Williamson (1986) found out that the transactional SCG structure accounts for the actual cost of outsourcing production of products or services including transaction costs, contracting costs, coordination costs, and search costs.

Table 4.29: Model Summary for Transactional Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.774 ^a	0.599	0.597	0.19418

a. Predictor: (Constant), Transactional supply chain governance

b. Dependable Variable: Performance of agro processing firms

4.6.2.3.1 ANOVA for Transactional Supply Chain Governance and Performance of Agro Processing Firms in Kenya

In Table 4.30, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. Since the p-value is less than 0.05, then transactional supply chain governance had a positive

significant explanatory power on performance of agro processing firms ($F=444.317$ and $p\text{-value} < 0.05$). The finding was supported by the $p\text{-value}$ of 0.000. The researcher rejected the null hypothesis stating that transactional supply chain does not influence the performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the transactional supply chain governance has significant influence on performance of agro processing firms in Kenya.

The findings of this study agree with Dolci, Maçada and Paiva (2017) who observed that transactional SCG is a more comprehensive view of the supply chain that focuses on more strategic aspects and long-term inter-organizational relationships. They concluded that transactional SCG affects the operational aspects with regard to global costs and in the financial aspects of investment return in a firm. Murrell, Karalashvili and Francis (2023) established that the transactional SCG structures encourage and support the initiatives of individual employees to explore new opportunities, to develop new products, and to improve work procedures for the benefit of the organization. Williamson (1986) found out that the transactional SCG structure accounts for the actual cost of outsourcing production of products or services including transaction costs, contracting costs, coordination costs, and search costs.

Table 4.30: ANOVA Table for Transactional Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	16.753	1	16.753	444.317	.000 ^b
	Residual	11.236	298	0.038		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictors: (Constant), Transactional supply chain governance

4.6.2.4 Regression Analysis of the Effect of Transformational Supply Chain Governance on Performance of Agro processing Firms in Kenya

The fourth objective of the study was designed to establish the effect of transformational supply chain governance on performance of agro processing firms in Kenya. The literature that was reviewed in this study as well as theoretical reasoning associated transformational supply chain governance with performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₄: Transformational supply chain governance does not significantly affect the performance of agro processing firms in Kenya.

The hypothesis was tested by running an ordinary least square regression model. The model summary in Table 4.31 demonstrates that the coefficient of determination as indicated by Adjusted R square to be 0.451 implying that 45.1% of performance of agro processing firms in Kenya is explained by transformational supply chain governance. Therefore, the researcher rejected the null hypothesis stating that transformational supply chain governance does not influence performance of agro processing firms in Kenya. Instead, the researcher considered the alternative hypothesis as transactional supply chain governance has significant effect on performance of agro processing firms in Kenya.

The results of this study are in agreement with literature reviewed. Gupta, Kumar, Kusi-Sarpong, Jabbour and Agyemang (2021) concluded that information technology is one of the enablers that organizations need to focus much in order to transform and improve their supply chain performance. They further stated that transformational SCG brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms, and managers must create an environment in which employees can accept and execute their responsibilities with confidence. The managers must communicate with their employees.

In their study, Lu, Wang and Wang (2023) found out that many companies have invested in greater supply chain digitization over the years to cope up with supply chain disruptions and to ensure performance. Pupkin (2023) noted that transformational SCG model seeks to address current challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making. According to Aben, van der Valk, Roehrich and Selviaridis (2021), there is need for comprehensive overhaul and modernization of a business’s supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Dubey, Gunasekaran, Childe, Papadopoulos and Fosso-Wamba, (2017) found out that transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms.

Table 4.31: Model Summary for Transformational Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.673 ^a	0.452	0.451	0.22679

a. Predictor: (Constant), Transformational supply chain governance

b. Dependable Variable: Performance of agro processing firms

4.6.2.4.1 ANOVA for Transformational Supply Chain Governance and Performance of Agro Processing Firms in Kenya

In Table 4.32, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the p-value is less than 0.05, then transformational supply chain governance had a significant explanatory power on performance of agro processing firms ($F=246.159$ and $p\text{-value} < 0.05$). The finding is also supported by the p-value of 0.000. Therefore, the

researcher rejected the null hypothesis stating that transformational supply chain governance does not influence performance of agro processing firms in Kenya and considered the alternative hypothesis as transactional supply chain governance has significant influence on performance of agro processing firms.

The results of this study are in agreement with literature reviewed. Gupta, Kumar, Kusi-Sarpong, Jabbour and Agyemang (2021) concluded that information technology is one of the enablers that organizations need to focus much in order to transform and improve their supply chain performance. They further stated that transformational SCG brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms, and managers must create an environment in which employees can accept and execute their responsibilities with confidence. The managers must communicate with their employees.

In their study, Lu, Wang and Wang (2023) found out that many companies have invested in greater supply chain digitization over the years to cope up with supply chain disruptions and to ensure performance. Pupkin (2023) noted that transformational SCG model seeks to address current challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making. According to Aben, van der Valk, Roehrich and Selviaridis (2021), there is need for comprehensive overhaul and modernization of a business's supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Dubey, Gunasekaran, Childe, Papadopoulos and Fosso-Wamba, (2017) found out that transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms.

Table 4.32: ANOVA Table for Transformational Supply Chain Governance and Performance of Agro Processing Firms in Kenya

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.661	1	12.661	246.159	.000 ^b
	Residual	15.327	298	0.051		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transformational supply chain governance

4.6.2.4.2 Regression Coefficients for Transformational Supply Chain Governance and Performance of Agro processing Firms in Kenya

From Table 4.33, regression equation can be written as:

$$Y = 2.177 + 0.508X_4$$

Where:

X_4 is transformational supply chain governance

Y is performance of agro processing firms in Kenya.

The regression equation above shows that when transformational supply chain governance is held constant at zero, performance of agro processing firms would be 2.177 units. There is an influence of transformational supply chain governance on performance of agro processing firms in Kenya. A unit increase in transformational supply chain governance increases performance of agro processing firms by 0.508 Units. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the p-value is less than 0.05, we conclude that there is a significant effect of transformational supply chain governance on performance of agro processing firms in Kenya. The finding is also supported by the p-value of 0.005. The researcher rejected the null hypothesis stating that transformational supply chain governance

does not influence performance of agro processing firms in Kenya and considered the alternative hypothesis since the transactional supply chain governance has positive significant effect on performance of agro processing firms in Kenya.

The results of this study are in agreement with literature reviewed. Gupta, Kumar, Kusi-Sarpong, Jabbour and Agyemang (2021) concluded that information technology is one of the enablers that organizations need to focus much in order to transform and improve their supply chain performance. They further stated that transformational SCG brings greater visibility across the supply chain, ensuring access to accurate data with actionable insights to help optimize the processes, recognize potential risks, recommendations to mitigate them, and to lower costs. Durach, Wiengarten and Choi (2020) noted that transformational SCG emphasizes motivation and inspiration to increase performance of firms, and managers must create an environment in which employees can accept and execute their responsibilities with confidence. The managers must communicate with their employees.

In their study, Lu, Wang and Wang (2023) found out that many companies have invested in greater supply chain digitization over the years to cope up with supply chain disruptions and to ensure performance. Pupkin (2023) noted that transformational SCG model seeks to address current challenges through a collaborative and inclusive approach, which requires the active participation of all relevant actors in decision-making. According to Aben, van der Valk, Roehrich and Selviaridis (2021), there is need for comprehensive overhaul and modernization of a business's supply chain network, designed to gain a competitive advantage by improving operational efficiency and boosting customer satisfaction. Dubey, Gunasekaran, Childe, Papadopoulos and Fosso-Wamba, (2017) found out that transformational SCG leads to various benefits like improved efficiency, cost reduction, increased visibility, enhanced customer experience, improved agility, enhanced collaboration, improved organizational structure, and sustainability to firms.

Table 4.33: Regression Coefficients Table for Transformational Supply Chain Governance and Performance of Agro processing Firms in Kenya

Model		Unstandardized		Standardize	t	Sig.
		B	Std. Error	d		
		Coefficients		Coefficients		
1	(Constant)	2.177	0.146		14.870	0.000
	X ₄	0.508	0.032	0.673	15.689	0.000
a.	Variable: Performance of Agro Processing Firms					Dependent
b.	Transformational supply chain governance					Predictor:

4.6.2.5 Regression Analysis of the Moderating Effect of Information Flow on Contractual Supply Chain Governance on the Performance of Agro Processing Firms

The study was designed to establish the moderating effect of information flow on contractual supply chain on performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₅: Information flow does not have a moderating effect on the relationship between contractual supply chain governance and performance of agro processing firms.

The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. The model summary in Table 4.34 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.606 when information flow was added as the moderating variable. This indicates that contractual supply chain governance, informational flow and the interaction effect of contractual supply chain governance and informational flow explain 60.6% of the performance of agro processing firms in Kenya. Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating influence of information flow on the relationship between

contractual supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between contractual supply chain governance and performance of agro processing firms in Kenya.

Table 4.34: Model Summary of Moderating Effect of Information Flow on Contractual Supply Chain Governance

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.698 ^a	0.487	0.486		0.21943
2	.780 ^b	0.609	0.606		0.19204

a. Predictors: (Constant), Contractual Supply Chain Governance

b. Predictors: (Constant), Contractual Supply Chain Governance, Information Flow

4.6.2.5.1 ANOVA for the Moderating Effect of Information Flow on Contractual Supply Chain Governance

In Table 4.35, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria was that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the p-value is less than 0.05, then contractual supply chain governance, informational flow and the interaction effect of contractual supply chain governance and informational flow had significant explanatory power on performance of agro processing firms ($F=230.968$ and p-value <0.05). The finding is supported by the p-value of 0.000. Thus, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between contractual supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating influence on the relationship between contractual supply chain governance and performance of agro processing firms in Kenya.

Table 4.35: ANOVA Table for the Moderating Effect of Information Flow on Contractual Supply Chain Governance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.640	1	13.640	283.287	.000 ^b
	Residual	14.348	298	0.048		
	Total	27.988	299			
2	Regression	17.035	2	8.518	230.968	.000 ^c
	Residual	10.953	297	0.037		
	Total	27.988	299			

a. Dependent Variable: Performance of Agro Processing Firms

b. Predictors: (Constant), Contractual Supply Chain Governance

c. Predictors: (Constant), Contractual Supply Chain Governance, Information Flow

4.6.2.5.2 Regression Coefficients for the Moderating Effect of Information Flow on Contractual Supply Chain Governance

Table 4.36 shows the regression coefficients of the regression model of performance of agro processing firms and contractual supply chain governance (X_1), information flow (Z) and the interaction effects of contractual supply chain governance and information flow (X_1Z). The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria was that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the coefficient of the interaction effect is significant, we conclude that there is a moderating effect of information flow on the relationship between performance of agro processing firms and contractual supply chain governance. Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating influence of information flow on the relationship between contractual supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information

flow has positive moderating influence on the relationship between contractual supply chain governance and performance of agro processing firms in Kenya.

Table 4.36: Table of Coefficients for the Moderating Effect of Information Flow on Contractual Supply Chain Governance

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	2.212	0.134		16.455	0.000
	Contractual Supply Chain Governance	0.508	0.030	0.698	16.831	0.000
2	(Constant)	1.197	0.158		7.567	0.000
	Contractual Supply Chain Governance	0.406	0.028	0.559	14.300	0.000
	Information Flow	0.325	0.034	0.375	9.595	0.000

a. Dependent Variable: Performance of Agro Processing Firms

4.6.2.6 Regression Analysis of the Moderating Effect of Information Flow on Relational Supply Chain Governance on the Performance of Agro Processing Firms

The study was designed to establish the moderating effect of information flow on relational supply chain on performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₅: Information flow does not have a moderating effect on the relationship between relational supply chain governance and performance of agro processing firms.

The model summary in Table 4.37 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.525. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05,

the H_0 fails to be accepted. This indicates that relational supply chain governance, informational flow and the interaction effect of relational supply chain governance and informational flow explain 52.5% of the performance of agro processing firms in Kenya. The researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between relational supply chain governance and performance of agro processing firms.

The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between relational supply chain governance and performance of agro processing firms in Kenya. This is in tandem with Obi, Qiang, Dogbe & Pomegbe (2020), who observed that the relational governance has a positive effect on supply chain performance and at the same time has an indirect effect on supply chain performance on manufacturing firms in Ghana through both information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance of manufacturing firms in Ghana.

Table 4.37: Model Summary for the Moderating Effect of Information Flow on Relational Supply Chain Governance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.728 ^a	0.530	0.525	0.21077

a. Dependent Variable: Performance of agro processing firms

b. Predictors: (Constant), Relational supply chain governance

c. Moderator: Information flow

4.6.2.6.1 ANOVA for the Moderating Effect of Information Flow on Relational Supply Chain Governance

In Table 4.38, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0

is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the p-value is less than 0.05, then relational supply chain governance, informational flow and the interaction effect of relational supply chain governance and informational flow had significant explanatory power on performance of agro processing firms in Keya (F=111.343 and p-value <0.05). The finding is supported by the p-value of 0.000.

Thus, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between relational supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between relational supply chain governance and performance of agro processing firms in Kenya. This is in line with According to Obi *et al.* (2020), who established that the relational governance has a positive effect on supply chain performance of manufacturing firms in Ghana and at the same time has an indirect effect on supply chain performance through both information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance.

Table 4.38: ANOVA Table for the Moderating Effect of Information Flow on Relational Supply Chain Governance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.839	3	4.946	111.343	.000 ^b
	Residual	13.149	296	0.044		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictors: (Constant), Relational supply chain governance

c. Moderator: Information flow

4.6.2.6.2 Regression Coefficients for the Moderating Effect of Information Flow on Relational Supply Chain Governance

Table 4.39 shows the regression coefficients of the regression model of performance of agro processing firms and relational supply chain governance (X_2), information flow (Z) and the interaction effects of relational supply chain governance and information flow (X_2Z). The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the coefficient of the interaction effect is not significant, we conclude that there is no moderating effect of information flow on the relationship between performance of agro processing firms and relational supply chain governance.

Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between relational supply chain governance and performance of agro processing firms in Kenya. Thus, the researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between relational supply chain governance and performance of agro processing firms in Kenya. The finding was in agreement with Obi *et al.* (2020), who found that the relational governance has a positive effect on supply chain performance of manufacturing firms in Ghana and at the same time has an indirect effect on supply chain performance through both information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance.

Table 4.39: Table of Coefficients for the Moderating Effect of Information Flow on Relational Supply Chain Governance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.338	1.752		-0.764	0.446
	X ₂	1.189	0.403	1.262	2.953	0.003
	Z	0.748	0.406	0.864	1.841	0.067
	X ₂ Z	-0.141	0.092	-1.262	-1.534	0.126

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Relational supply chain governance

c. Moderator: Information flow

4.6.2.7 Regression Analysis of the Moderating Effect of Information Flow on Transactional Supply Chain Governance on the Performance of Agro Processing Firms

The study was designed to establish the moderating effect of information flow on transactional supply chain governance on performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₅: There Information flow does not have a moderating effect on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya.

The model summary in Table 4.40 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.646. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. This indicates that transactional supply chain governance, informational flow and the interaction effect of transactional supply chain governance and informational flow explain 64.6% of the performance of agro processing firms in Kenya.

Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating influence on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya. This is in agreement with Obi *et al.* (2020), who observed that the higher levels of information sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana.

Table 4.40: Model Summary for the Moderating Influence of Information Flow on Transactional Supply Chain Governance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.806 ^a	0.649	0.646	0.18211

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transactional supply chain governance

c. Moderator: Information flow

4.6.2.7.1 ANOVA for the Moderating Effect of Information Flow on Transactional Supply Chain Governance

In Table 4.41, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the p-value is less than 0.05, then transactional supply chain governance, informational flow and the interaction effect of transactional supply chain governance and informational flow had significant explanatory power on performance of agro processing firms in Kenya ($F=182.653$ and $p\text{-value} < 0.05$). The finding is supported by the p-value of 0.000.

Thus, the researcher rejected the null hypothesis stating that there is no significant moderating influence of information flow on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating influence on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya. This is in line with Obi *et al.* (2020), who established that the higher levels of information sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making. Durugbo, *et al.*, (2013) stated that data stream must be effective when firms need data for innovation use. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution.

Table 4.41: ANOVA Table for the Moderating Effect of Information Flow on Transactional Supply Chain Governance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.172	3	6.057	182.653	.000 ^b
	Residual	9.816	296	0.033		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transactional supply chain governance

c. Moderator: Information flow

4.6.2.7.2 Regression Coefficients for the Moderating Effect of Information Flow on Transactional Supply Chain Governance

Table 4.42 shows the regression coefficients of the regression model of performance of agro processing firms and transactional supply chain governance (X_3), information flow (Z) and the interaction effects of transactional supply chain governance and information flow (X_3Z). The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the coefficient of the interaction effect is not significant, we conclude that there is no moderating effect of information flow on the relationship between performance of agro processing firms and transactional supply chain governance.

Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between transactional supply chain governance and performance of agro processing firms in Kenya. This is in tandem with Obi *et al.* (2020), who concluded that the higher levels of information sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making. Durugbo, *et al.*, (2013) stated that data stream must be effective when firms need data for innovation use. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution.

Table 4.42: Table of Coefficients for the Moderating Effect of Information Flow on Transactional Supply Chain Governance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.420	1.205		2.838	0.005
	X ₃	0.004	0.295	0.008	0.015	0.004
	Z	0.077	0.065	0.893	1.179	0.239
	X ₃ Z	-0.092	0.269	-0.106	-0.342	0.733

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transactional supply chain governance

c. Moderator: Information flow

4.6.2.8 Regression Analysis of the Moderating Effect of Information flow on Transformational SCG on the Performance of Agro Processing Firms

The study was designed to establish the moderating effect of information flow on transformational supply chain governance on performance of agro processing firms. Following the theoretical arguments, the following hypothesis was formulated and tested:

H₀₅: Information flow does not have a moderating effect on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya.

The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H₀ is not rejected but if it is less than 0.05, the H₀ fails to be accepted. The model summary in Table 4.43 demonstrates the coefficient of determination as indicated by Adjusted R square to be 0.480. This indicates that transformational supply chain governance, informational flow and the interaction effect of transformational supply chain governance and informational flow explain 48.0% of the performance of agro processing firms in Kenya.

Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya. This is in agreement with Obi *et al.* (2020), who found that the higher levels of information sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making. Durugbo, *et al.*, (2013) stated that data stream must be effective when firms need data for innovation use. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution.

Table 4.43: Model Summary for the Moderating Effect of Information Flow on Transformational SCG

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.696 ^a	0.485	0.480	0.22071

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transformational supply chain governance

c. Moderator: Information flow

4.6.2.8.1 ANOVA for the Moderating Effect of Information Flow on Transformational SCG

In Table 4.44, the ANOVA was used to show the overall model significance. The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the p-value is less than 0.05, then transformational supply chain governance, informational flow and the interaction effect of transformational supply chain governance and informational flow had significant explanatory power on performance of agro processing firms in Keya ($F=92.845$ and $p\text{-value} < 0.05$). The finding is supported by the p-value of 0.000.

Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating influence of information flow on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya. This is in tandem with Obi *et al.* (2020), who that the higher levels of information sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making. Durugbo, *et al.*, (2013) stated that data stream must be effective when firms need data for innovation use. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution.

Table 4.44: ANOVA Table for the Moderating Effect of Information Flow on Transformational SCG

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.569	3	4.523	92.845	.000 ^b
	Residual	14.420	296	0.049		
	Total	27.988	299			

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transformational supply chain governance

c. Moderator: Information flow

4.6.2.8.2 Regression Coefficients for the Moderating Effect of Information Flow on Transformational Supply Chain Governance

Table 4.45 shows the regression coefficients of the regression model of performance of agro processing firms and transformational supply chain governance (X_4), information flow (Z) and the interaction effects of transformational supply chain governance and information flow (X_4Z). The hypothesis was tested by running an ordinary least square regression model. The acceptance and rejection criteria were that, if the p-value is greater than 0.05, the H_0 is not rejected but if it is less than 0.05, the H_0 fails to be accepted. Since the coefficient of the interaction effect is significant, we conclude that there is moderating effect of information flow on the relationship between performance of agro processing firms and transformational supply chain governance. This finding is supported by the p-value of 0.000.

Therefore, the researcher rejected the null hypothesis stating that there is no significant moderating effect of information flow on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya. The researcher considered the alternative hypothesis since the information flow has positive moderating effect on the relationship between transformational supply chain governance and performance of agro processing firms in Kenya. This is in line with Obi *et al.* (2020), who established that the higher levels of information

sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making. Durugbo, *et al.*, (2013) stated that data stream must be effective when firms need data for innovation use. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution.

Table 4.45: Table of Coefficients for the Moderating Effect of Information Flow on Transformational Supply Chain Governance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.025	2.041		1.482	0.139
	X ₄	0.105	0.465	0.139	0.226	0.001
	Z	-0.069	0.457	-0.080	-0.151	0.880
	X ₄ Z	0.063	0.103	0.634	0.609	0.543

a. Dependent Variable: Performance of agro processing firms

b. Predictor: (Constant), Transformational supply chain governance

c. Moderator: Information flow

4.6.3 Multiple Linear Regression Findings

Multiple linear regression, also known simply as multiple regression, is a statistical technique that uses several explanatory variables to predict the outcome of a response variable (Denzin, 2017). Multiple regression is an extension of linear ordinary least squares regression that uses just one explanatory variable. In statistics, ordinary least squares is a type of linear least squares method for estimating the unknown parameters in a linear regression model (Wondola, Aulele & Lembang, 2020). As a predictive analysis, the multiple linear regression is used to explain the relationship between one continuous dependent variable and two or more independent variables (Se Yoon, 2021). Multiple regression analysis allows

researchers to assess the strength of the relationship between the dependent variable and several predictor variables as well as the importance of each of the predictors to the relationship, often with the effect of other predictors statistically eliminated (Armstrong, 2019).

In the multiple linear regression equation, b_1 is the estimated regression coefficient that quantifies the association between the risk factor X_1 and the outcome adjusted for X_2 (b_2 is the estimated regression coefficient that quantifies the association between the potential confounder and the outcome). In this section, the findings are discussed focusing on the main objectives of this study which sought to determine the effect of supply chain governance on performance of agro processing firms in Kenya. To prove this, a multiple linear regression model was adopted for testing the significance of the effect of the independent variables on the dependent variable. Therefore, the overall model for the study was-

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

Where:

Y = performance of agro processing firms is the dependent variable

β 's are the coefficients of the model.

X 's are the independent variables

X_1 = contractual supply chain governance

X_2 = relational supply chain governance

X_3 = transactional supply chain governance

X_4 = transformational supply chain governance

Z = Information Flow

ϵ is the error term

4.6.3.1 Optimal Model without Moderating Variable Findings

The model summary in Table 4.46 demonstrates the coefficient of determination as indicated by Adjusted R Square to be 0.734 implying that contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance explain 73.4 % of the performance of agro processing firms. The remaining 26.6% of the variation in performance of agro processing firms could be explained by other factors not involved in this study. This finding is in tandem with Jiguang & Bing (2018), who observed that supply governance enhances the performance of firms in China when implemented with the good governance structures.

The finding is in line with Anupam & Fedorowicz (2015), who established that supply chain governance improves the efficiency and productivity of the business organizations in India. This is in agreement with Kingoo and Chirchir (2013), who established that supply chain governance improves the organizational performance among parastatals in Kenya. The result is in tandem with Dolci *et al.* (2017), who concluded that supply chain governance has a positive significant influence on supply chain performance. Gyau and Spiller (2012), observed that supply chain governance structures have positive impact on the inter-firm relationship performance in agribusiness in Ghana. This result is in tandem with Farhad (2019), who concluded that supply chain governance mechanisms and governance structures improve social sustainability performance when stakeholders are engaged and enhance performance of ready-made garment industry in Bangladesh.

Table 4.46: Overall Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859 ^a	0.737	0.734	0.15788

a. Predictors: (Constant), contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance
b. Dependable Variable: Performance of agro processing firms
c. Moderator: Information flow

4.6.3.1.1 Overall ANOVA Model

In Table 4.47, the ANOVA was used to show the overall model significance. Since the p-value is less than 0.05, this means that the whole model is significant. ($F = 206.978$ and $p\text{-value} < 0.05$). This result is in tandem with Farhad (2019), who concluded that supply chain governance mechanisms and governance structures improve social sustainability performance when stakeholders are engaged and enhance performance of ready-made garment industry in Bangladesh. This finding is in line with Jiguang and Bing (2018), who observed that supply governance enhances the performance of firms in China when implemented with the good governance structures. The result is in tandem with Dolci *et al.* (2017), who concluded that supply chain governance has a positive significant influence on supply chain performance. The finding is in line with Anupam and Fedorowicz (2015), who established that supply chain governance improves the efficiency and productivity of the business organizations in India. This is in agreement with Kingoo and Chirchir (2013), who established that supply chain governance improves the organizational performance among parastatals in Kenya.

Table 4.47: Overall ANOVA Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.636	4	5.159	206.978	.000 ^b
	Residual	7.353	295	0.025		
	Total	27.988	299			

a. Dependable Variable: Performance of agro processing firms

b. Predictors: (Constant), contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance

c. Moderator: Information flow

4.6.3.1.2 Regression Coefficients for Overall Model

The results in Table 4.48, shows that there was a significant influence of contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance on the performance

of agro processing firms in Kenya. This is because the p-value of the predictors was less than 0.05 the level of significance. This result is in tandem with Farhad (2019), who concluded that supply chain governance mechanisms and governance structures improve social sustainability performance when stakeholders are engaged and enhance performance of ready-made garment industry in Bangladesh.

This finding is in line with Jiguang & Bing (2018), who observed that supply governance enhances the performance of firms in China when implemented with the good governance structures. The result is in tandem with Dolci *et al.* (2017), who concluded that supply chain governance has a positive significant influence on supply chain performance. The finding is in line with Anupam & Fedorowicz (2015), who established that supply chain governance improves the efficiency and productivity of the business organizations in India. This is in agreement with Kingoo and Chirchir (2013), who established that supply chain governance improves the organizational performance among parastatals in Kenya.

Table 4.48: Regression Coefficients for Overall Model

Model	Unstandardized Coefficients			Standardized Coefficients	
	B	Std. Error	Beta	T	Sig.
(Constant)	1.325	0.134		9.916	0.000
Contractual Supply Chain Governance	0.160	0.031	0.221	5.165	0.000
Relational Supply Chain Governance	0.295	0.038	0.313	7.722	0.000
Transactional Supply Chain Governance	0.221	0.024	0.415	9.391	0.000
Transformational Supply Chain Governance	0.042	0.035	0.256	5.222	0.000

- a. Dependable Variable: Performance of Agro Processing Firms
- b. Predictors: (Constant), contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance
- c. Moderator: Information flow

4.6.3.2 Optimal Model with Moderating Variable Findings

The model summary in Table 4.49 demonstrates the coefficient of determination as indicated by R Square to be 0.691 implying that the interaction effect of information flow and each of the independent variables explain 69.1% of the performance of agro processing firms. This indicates that the interaction effect of information flow with the four predictors (contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance) together explains 69.1% performance of agro processing firms. Other predictors not involved in this study could explain the remaining 20.9% of the variation in performance of agro processing firms.

This is in tandem with Obi *et al.* (2020), who observed that the higher levels of information sharing and quality of information can lead to enhanced supply chain performance of manufacturing firms in Ghana. As explained by Musa (2012), information flow helps in updating all the supply chain elements and therefore provides resources for supply chain decision making. Durugbo, *et al.*, (2013) stated that data stream must be effective when firms need data for innovation use. Chopra and Meindl, (2013) noted that information provides supply chain visibility, allowing managers to make decisions to improve the performance of supply chain. According to Alexander (2015), data stream and sharing is critical to the accomplishment of production network execution.

Table 4.49: Model Summary with Moderating Variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834 ^a	0.695	0.691	0.17007

- a. Predictors: (Constant), contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance
- b. Dependable Variable: Performance of Agro Processing Firms
- c. Moderator: Information flow

4.6.3.2.1 ANOVA with Moderating Variable

In Table 4.50, the ANOVA was used to show the overall model significance. Since the p-value is less than 0.05, this means that the whole model is significant. ($F = 168.161$ and $p\text{-value} < 0.05$). This result is in tandem with Farhad (2019), who concluded that supply chain governance mechanisms and governance structures improve social sustainability performance when stakeholders are engaged and enhance performance of ready-made garment industry in Bangladesh. This finding is in line with Jiguang and Bing (2018), who observed that supply governance enhances the performance of firms in China when implemented with the good governance structures.

The result is in tandem with Dolci *et al.* (2017), who concluded that supply chain governance has a positive significant influence on supply chain performance. The finding is in line with Anupam and Fedorowicz (2015), who established that supply chain governance improves the efficiency and productivity of the business organizations in India. This is in agreement with Kingoo and Chirchir (2013), who established that supply chain governance improves the organizational performance among parastatals in Kenya.

Table 4.50: ANOVA with Moderating Variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.456	4	4.864	168.161	.000 ^b
	Residual	8.533	295	0.029		
Total		27.988	299			

a. Dependable Variable: Performance of Agro Processing Firms

b. Predictors: (Constant), contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance

c. Moderator: Information flow

4.6.3.2.2 Regression Coefficients for Overall Model

The results in Table 4.51 shows that there was a significant effect of the interaction of contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance and information flow. The results also indicated that there were positive and negative coefficients. A positive coefficient indicates that as the value of the independent variable increases, the mean of the dependent variable also tends to increase. While, a negative coefficient suggests that as the independent variable increases, the dependent variable tends to decrease. There this result is in tandem with Farhad (2019), who concluded that supply chain governance mechanisms and governance structures improve social sustainability performance when stakeholders are engaged and enhance performance of ready-made garment industry in Bangladesh. This finding is in line with Jiguang and Bing (2018), who observed that supply governance enhances the performance of firms in China when implemented with the good governance structures.

This is in tandem with Obi, Qiang, Dogbe and Pomegbe (2020), who observed that the relational governance has a positive effect on supply chain performance and at the same time has an indirect effect on supply chain performance on manufacturing firms in Ghana through both information sharing and quality of information. They further stated that the higher levels of information sharing and quality of information can lead to enhanced effect of relational governance on supply chain performance of manufacturing firms in Ghana. The result is in line with Dolci *et al.* (2017), who concluded that supply chain governance has a positive significant influence on supply chain performance. The finding is in line with Anupam & Fedorowicz (2015), who established that supply chain governance improves the efficiency and productivity of the business organizations in India. This is in agreement with Kingoo and Chirchir (2013), who established that supply chain governance improves the organizational performance among parastatals in Kenya.

Table 4.51: Regression Coefficients for Overall Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.880	0.077		37.582	0.000
	X ₁ Z	0.048	0.008	0.447	6.249	0.000
	X ₂ Z	0.040	0.008	0.489	5.235	0.000
	X ₃ Z	0.052	0.006	0.599	9.065	0.000
	X ₄ Z	-0.028	0.008	-0.283	-3.428	0.001

- a. Dependable Variable: Performance of Agro Processing Firms
- b. Predictors: (Constant), contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance
- c. Moderator: Information flow

4.7 Summary of Hypothes Test Findings

The results on testing of the research hypotheses are as revealed in table 4.52 below:

Table 4.52: Research Hypotheses Testing Results

S/No	Hypotheses	Rule	T -Test	Conclusion
1	H₀₁ : Contractual supply chain governance does not significantly affect the performance of agro processing firms in Kenya. H_{a1} : Contractual supply chain governance significantly affects the performance of agro processing firms in Kenya.	If the $P \leq 0.05$, we reject H_{01} and accept H_{a1}	5.165 & .000	Reject H_{01} Accept H_{a1}
2	H₀₂ : Relational supply chain governance does not significantly affect the performance of agro processing firms in Kenya. H_{a2} : Relational supply chain governance significantly affects the performance of agro processing firms in Kenya.	If the $P \leq 0.05$, we reject H_{02} and accept H_{a2}	7.722 & .000	Reject H_{02} Accept H_{a2}
3	H₀₃ : Transactional supply chain governance does not significantly affect the performance of agro processing firms in Kenya. H_{a3} : Transactional supply chain governance significantly affects the performance of agro processing firms in Kenya.	If the $P \leq 0.05$, we reject H_{03} and accept H_{a3}	9.391 & .000	Reject H_{03} Accept H_{a3}
4	H₀₄ : Transformational supply chain governance does not significantly affect the performance of agro processing firms in Kenya. H_{a4} : Transformational supply chain governance significantly affects the performance of agro processing firms in Kenya.	If the $P \leq 0.05$, we reject H_{04} and accept H_{a4}	5.222 & .000	Reject H_{04} Accept H_{a4}
5	H_{05s} : Information flow does not have a moderating effect on the relationship between contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and performance of agro processing firms in Kenya. H_{a5s} : Information flow moderates the relationship between contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and performance of agro processing firms in Kenya.	If the $P \leq 0.05$ for all independent variables, we reject H_{05s} and accept H_{a5s}	6.249 5.235 9.065 -3.428 & .000 .000 .001	Reject H_{05s} Accept H_{a5s}

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study was based on 344 agro processing firms in Kenya registered and members of KAM as of the year 2019. It examined the effect of supply chain governance conceptions namely: contractual SCG, relational SCG, transactional SCG and transformational SCG on performance of agro processing firms in Kenya. Similarly, the study investigated the moderating effect of information flow on the relationship between supply chain governance conceptions and the performance of the agro processing firms in Kenya. This chapter is therefore divided into four sections. Section 5.2 presents summary of the study, section 5.3 presents conclusions, section 5.4 presents the recommendations and section 5.5 presents areas of further research. Thus, this chapter presents the summary of the study as guided by the specific objectives, research hypothesis and conclusion reached based on the findings and recommendations for enhancing the performance of agro processing firms in Kenya as well as recommendations for further research.

5.2 Summary of Findings

The study sought to determine the effect of supply chain governance on the performance of agro processing firms in Kenya. The study specifically focused on contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and the moderating effect of information flow on how they effect the performance of agro processing firms in Kenya. The empirical literature indicated that when adopted and implemented, supply chain governance and its conceptions (contractual, relational, transactional and transformational) increase the productivity, sales growth, market shares, return of assets, product quality, customer satisfaction, and profitability of the firms. The supply chain governance mechanism is considered the structure that ensures that decisions are made along the lines determined by the

organization's corporate strategy, in order to increase or maintain the value of the company in the long term. The increased globalization and international codependency have led to the idea that there should be governing system in place to help guide these global supply chains to perform more efficiently.

In this study, the survey design describing the phenomenon associated with the subject population was used to obtain information concerning the current phenomenon and where possible, to draw valid general conclusion from the facts discussed. The survey design allowed testing of relationship between variables and this was fundamental for this study. In order to achieve this objective, the study utilized both quantitative and qualitative approaches as they reinforce each other. The model summary showed that contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance have significant effect on performance of agro processing firms in Kenya.

5.2.1 Influence of Contractual Supply Chain Governance on Performance of Agro Processing Firms in Kenya

This study provided evidence from the respondents through descriptive analysis that contractual supply chain governance significantly and positively effects the performance of agro processing firms in Kenya. This implies that an increase in performance of agro processing firm is through embracing contractual supply chain governance within supply chain governance system. The contracts help the agro processing firms in allocation and distribution of task and risks as well as setting enforceable standards with their stakeholders. The firms use contractual supply chain governance structure to manage the relationships between parties to a transaction, and reduce opportunism and favor relationship performance. The firms maintain the independent legal committees that manage firm's contracts with stakeholders, and mutual trust in contracts help in managing customer and supplier relationships. This study established that contractual supply chain governance effects performance of firms by identifying suppliers through the process of vendor rating and accreditation to enhance performance of firms.

5.2.2 Influence of Relational Supply Chain Governance on Performance of Agro Processing Firms in Kenya

From the descriptive findings, this study established that there is a significant positive relationship between relational supply chain governance and performance of agro processing firms. A positive increase of relational supply chain governance within the processes increases the performance of firms. The firms manage relationships with the suppliers through social processes and regulations and the relational norms directly effect suppliers' attitudes and behaviour to engage in collaborative activities. The study confirmed that firms have open communication with its customers and suppliers, and share information with their customers and suppliers regularly that increase performance. It was established that trust and cooperative spirit help firms to facilitate joint planning that create a stable and committed relationship. The firms coordinate and hold regular meetings with its customers and suppliers then train them to build the right capacity. This study confirmed that relational supply chain governance helps firms in problem solving and restraints on unethical uses of power through relational processes that enhance relationship quality, cooperation and coordination between buyers and suppliers to speed performance agro processing of firms in Kenya.

5.2.3 Influence of Transactional Supply Chain Governance on Performance of Agro Processing Firms in Kenya

The study confirmed that transactional supply chain governance positively influences the performance of agro processing firms. An improvement on transactional supply chain governance within the supply chain governance system results on a positive significant increase on performance of agro processing firms. Therefore, study established that transactional supply chain governance has a positive effect on the performance of agro processing firms. The transactional supply chain governance was found to have positive significant effect on the performance of agro processing firms in Kenya. This study confirmed that firms promote compliance by followers through the reward system, and rewards depend on agreement between the firms and employees. The firms encourage and support the initiatives of individual employees

to explore new opportunities for the benefit of the firm through supervision, bonuses and incentives to enhance performance. The study determined that transactional supply chain governance enhances entrepreneurial behavior and skills of employees who are encouraged by firms to develop new products and ideas to increase performance of agro processing firms in Kenya.

5.2.4 Influence of Transformational Supply Chain Governance on Performance of Agro Processing Firms in Kenya

This study provided evidence that transformational supply chain governance significantly and positively effects the performance of agro processing firms in Kenya. This implies that an increase in performance of agro processing firm is through embracing transformational supply chain governance within supply chain governance system. This study summarized that transformational supply chain governance positively effect performance of agro processing firms. Transformational supply chain governance works better when implemented with good structures and rules that guide a firm in enhancing competitive edge within the global supply chains. The study established that the business culture change is important for the success of the firms and that the firms to reward best performing employees to improve performance. The transformational supply chain governance guides, encourages, empowers, motivates and facilitates by setting more challenging expectations and typically achieve higher performance. The transformational supply chain governance improves performance of the agro processing firms through creation of fair environment in which employees can accept and execute their responsibilities with confidence and reward the best performing employees.

5.2.5 Moderating Effect of Information Flow on the Relationship between Supply Chain Governance and Performance of Agro Processing Firms in Kenya

The study confirmed that information flow significantly moderates the relationship between the independent variables and performance of processing firms. The findings from descriptive and inferential analysis provided the basis to summarize that information flow do moderate the relationship between independent variables and performance of agro processing firms in Kenya. This is in agreement with some

of the existing literature. This study established that this moderating variable plays a big role on performance of firms. The study also confirmed that information flow moderates the variables well to achieve the best performance of agro processing firms in Kenya. Information flow moderate the effect of supply chain governance conceptions on the performance of the firm. This study established the integrated information systems allow open communication with clients that lead to increase in understanding and decrease in uncertainty and improve customer relationship management. Information flow enhances firms' supply chain management, operational efficiency and innovations, and reduces firms' production costs and timelines. Hence, the information flow moderates the effect of supply chain governance on the performance of their firms in Kenya.

5.3 Conclusions of the Study

The study aimed to establish the effect of supply chain governance on the performance of agro processing firms in Kenya. Additionally, the study sought to find out the moderating effect of information flow on the relationship between supply chain governance and the performance of the agro processing firms. The study established that all the four independent variables significantly influenced performance of agro processing firms in Kenya. The model summary demonstrated that contractual supply chain governance, relational supply chain governance, transactional supply chain governance and transformational supply chain governance explained the performance of agro processing firms.

5.3.1 Contractual Supply Chain Governance

This study sought to establish the effect of contractual supply chain governance on the performance of agro processing firms in Kenya. The study established that contractual supply chain governance had a significant effect on the performance of agro processing firms in Kenya. This study provided evidence from the respondents through descriptive analysis that contractual supply chain governance significantly and positively effects the performance of agro processing firms in Kenya. This implied that an increase in performance of agro processing firm is through embracing contractual supply chain governance within supply chain governance system. As a

result, the study concluded that contractual supply chain governance positively effect performance of agro processing firms. This study also concluded that contractual supply chain governance to be implemented in the firms with good structures and rules that guide a firm in enhancing competitive edge within the global supply chains. This study concludes that the contracts help the firm in setting enforceable standards, and mutual trust in contracts help in managing customer and supplier relationships.

5.3.2 Relational Supply Chain Governance

The study sought to determine the effect of relational supply chain governance on the performance of agro processing firms in Kenya. The results showed that relational supply chain governance had effect on the performance of agro processing firms in Kenya. This indicates that the proper implementation and adoption of relational supply chain governance improves the performance of agro processing firms in Kenya. From the descriptive and inferential findings, this study established that there is a significant positive relationship between relational supply chain governance and performance of agro processing firms. A positive increase of relational supply chain governance within the processes increases the performance of firms.

Therefore, it was concluded in the study that relational supply chain governance within the operations of the firm is positively significant on their performance. The study concluded that sound relationship with customers and suppliers is good for the performance of firms. The study also concluded that good relationship with stakeholders (staff, customers, suppliers, etc.) would lead outcome of quality products and promote customer satisfaction. This study concludes that relational norms directly effect suppliers' attitudes and behaviour to engage in collaborative activities hence improving the performance of the firms.

5.3.3 Transactional Supply Chain Governance

This study sought to find out the effect of transactional supply chain governance on the performance of agro processing firms in Kenya. The positive significance was maintained even with the introduction of information flow as the moderating

variable. The study concluded that transactional supply chain governance plays a big role in the performance of agro processing firms in Kenya. The study confirmed that transactional supply chain governance positively impacts on the performance of agro processing firms. An improvement on transactional supply chain governance within the supply chain governance system results on a positive significant increase on performance of agro processing firms. The study can thus conclude that transactional supply chain governance has a positive effect on the performance of agro processing firms. The transactional supply chain governance was found to have positive significant effect on the performance of agro processing firms in Kenya.

As a result of the descriptive and inferential analysis, the study concluded that there is a positive relationship between transactional supply chain governance and performance of agro processing firms and it needs to be impressed at all level of operation to improve on performance. This study concluded that transactional supply chain governance enhances the performance of firms. The study concludes that the firms to encourage and support the initiatives of employees to explore new opportunities for the benefit of the firm. The firms to provide bonuses and merits to employees when they meet certain goals. It was also confirmed that transactional supply chain governance enhances entrepreneurial behavior and skills of employees that enhance the performance of firms.

5.3.4 Transformational Supply Chain Governance

The study aimed at the examination of the effect of transformational supply chain governance on the performance of agro processing firms in Kenya. The results showed that transformational supply chain governance had effect on the performance of agro processing firms in Kenya. The effect was significant in the model. This study results showed a strong positive relationship between transformational supply chain governance and the performance of agro processing firms. This study provided evidence that transformational supply chain governance significantly and positively effects the performance of agro processing firms in Kenya. This implies that an increase in performance of agro processing firm is likely through embracing transformational supply chain governance within supply chain governance system.

As a result, the study concluded that transformational supply chain governance positively effect performance of agro processing firms. This study also concludes that transformational supply chain governance to be implemented in the firms with good structures and rules that guide a firm in enhancing competitive edge within the global supply chains. The study determined that transformational supply chain governance had a positive effect on performance of agro processing firms. This study concludes that the business culture change is important for the success of the firms and that the firms to reward best performing employees to improve performance.

5.3.5 Moderating Effect of Information Flow

This study sought to find out the moderating effect of information flow on the effect of supply chain governance on performance of agro processing firms in Kenya. The results of this study indicated that information flow moderates the variables and finally influenced the performance of agro processing firms in Kenya. The study confirmed that information flow moderates the relationship between the independent variables (contractual SCG, relational SCG, and transactional SCG) and performance of processing firms. This finding provided the basis to conclude that information flow moderates the relationship between independent variables (contractual SCG, relational SCG, and transactional SCG) and performance of agro processing firms in Kenya. This is in agreement with some of the existing literature. This study established that this moderating variable plays a big role on performance of firms. The study also concludes that information flow moderates the variables well to achieve the best performance of agro processing firms in Kenya. Information flow moderate the effect of supply chain governance conceptions on the performance of the firm.

This study provides substantive support for previous findings in the supply chain governance and fresh insight about supply chain governance and performance of agro processing firms in Kenya. In overall, supply chain governance was found to be collectively significantly influencing the performance of the agro processing firms. Subsequently, the study has a basis to conclude that, collectively, supply chain governance effects the performance of the agro processing firms in Kenya. In today's

competitive business environment, organizations cannot afford to ignore the supply chain governance systems to improve their performance for the competitive position within the global.

5.4 Recommendations of the Study

This section provides the recommendations related to the effect of supply chain governance on performance of agro processing firms in Kenya. This study has revealed that contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and the moderating effect of information flow had positively influenced the performance of agro processing firms in Kenya. Based on the study findings, the following recommendations are given under the study specific objectives.

5.4.1 Contractual Supply Chain Governance

The study recommends that the firms should maintain the independent legal committees that manage the contracts of the firms with stakeholders. The firms to identify suppliers through the process of vendor rating and accreditation, and consider long-term contracts with their main suppliers. The firms to encourage mutual trust in contracts to help in managing customer and supplier relationships. According to this study, it was established that contractual supply chain governance positively predicts the performance of agro processing firms in Kenya. Therefore, the study recommends that agro processing firms in Kenya should incorporate contractual supply chain governance in their operations to increase overall efficiency, productivity, enhanced market share and return on assets thereby impacting positively on their performance.

5.4.2 Relational Supply Chain Governance

This study established a significant positive relationship between relational supply chain governance and performance of agro processing firms. The study therefore, recommends adoption of relational supply chain governance system in the processes of the agro processing firms in Kenya. Relational supply chain governance is capable

to enhance the productivity, increase return on assets, ensure market shares, improve quality of products and customer service of the agro processing firms thus impacting positively on both financial and none financial performance of the firms. This study further recommends that the firms should manage their relationships with the customers and suppliers through social processes and regulations. The firms to encourage open communication and regularly share information with their customers and suppliers. It is important for the firms to coordinate and hold regular meetings with their suppliers, and train their customers and suppliers to build the right capacity.

5.4.3 Transactional Supply Chain Governance

Transactional supply chain governance is a part of governance style that focuses on supervision, organization and performance of firms through promotion of compliance by both rewards and punishments. This study established that transactional supply chain governance statistically and significantly influences the performance of agro processing firms. Therefore, this study recommends that the firms to promote compliance by followers through the reward and recognition system depending on agreement between the firms and employees. The firms to enhance monitoring capacity as managerial governance to achieve the firm's goals.

5.4.4 Transformational Supply Chain Governance

Transformational supply chain governance is the process of creating, sustaining and enhancing governance-follower, follower-governance and governance-governance partnerships in pursuit of a common vision in accordance with shared values and on behalf of the industry in which managers and general staff jointly serve. In management of firms, transformational supply chain governance has become an important element that reflects collaboration within the supply chain governance and performance of agro processing firms. The study established that transformational supply chain governance significantly and positively predicts the performance of agro processing firms in Kenya.

The study recommends that the agro processing firms in Kenya should implement transformational supply chain governance to enhance the understanding between managers and general staff. This will improve the productivity, profitability, customer satisfaction and hence the performance of firms. The study further recommends that the firms to embrace business culture change that is important for the success of their firms. The employees to be motivated through setting more challenging expectations in order to achieve higher performance, and ensure that the workers have the right capacity. The firms need to engage the visionary and strategist managers to propel the implementation of transformational supply chain governance.

5.4.5 Information Flow

The study found out that information flow significantly moderates the relationship between supply chain governance and performance of agro processing firms in Kenya. Consequently, the study recommends that agro processing firms in Kenya should invest in information integrated systems which presently amounts to significant effect on performance of their firms. Improvement of information flow effect the performance of supply chain governance and functions of contractual, relational, transactional and transformational that by extension influences performance of the firms. This study further recommends that the firms to adopt integrated information systems that allow open communication with clients that increase understanding and decrease the uncertainty. The firms should frequently communicate and share information with their customers and suppliers. This will improve the firms' manufacturing processes, increase operational efficiency through innovations, and reduce the firms' production costs and timelines.

5.4.6 Contribution of the Study

This study contributes to knowledge in the field of supply chain governance on how it improves the performance of agro processing firms in Kenya, which have not been studied exhaustively. The study points out that supply chain governance together with its four conceptions (contractual, relational, transactional and transformational) increase the performance of agro processing firms. The findings of this study reveal that when supply chain governance is well implemented, it will increase the

profitability, sales growth, market share, productivity and customer satisfaction of the firms. This study has broadly investigated the reasons why agro processing firms in Kenya do export raw products without adding value for better foreign exchange. It has been established that this happens due to use of old supply chain systems by firms, hence the study recommends adoption of new supply chain systems like supply chain governance. Therefore, clear understanding, sufficient skills and knowledge on supply chain governance together with its conceptions will facilitate its implementation by agro processing firms in Kenya to enable them enhance problem solving process. This study used a survey research design that allowed for more comprehensive analyses to avoid the shortcomings and inconsistencies suffered in earlier studies.

5.5 Areas for Future Research

The study findings were based on supply chain governance and performance of agro processing firms in Kenya that could bring out the whole aspect of the sector and other manufacturing sectors. This study used a literature review suggesting that contractual supply chain governance, relational supply chain governance, transactional supply chain governance, and transformational supply chain governance as well as the constructs and theories supporting these variables. This study provided considerable information and expectations of agro processing firms, but could not cover their whole aspect of processes. The study was based on agro processing firms in Kenya, and there is need to undertake similar studies in other manufacturing sectors to enable comparisons of the findings.

Supply chain governance is a recent governing system of rules, structures and institutions that guide, control and lead supply chains through policies and regulations with the goal of creating greater efficiency. A review of literature indicated that there has been limited studies on effect of supply chain governance on performance of agro processing firms within Kenya and African region. Thus, the finding of this study serves as a guide for future studies on effect of supply chain governance on performance of firms. Performance in supply chain governance

systems has not been widely studied which presents gaps in Africa and Kenyan context.

This study has contributed to knowledge by establishing that the independent variables have significant effect on performance of agro processing firms in Kenya. The study has clearly pointed out the responsibility of supply chain governance systems on performance of the agro processing sector in Kenya. This study confined itself to the 344 agro processing firms registered and are members of Kenya Association of Manufacturers (KAM). The findings and inferences made from this study are delimited to the constructs of contractual supply chain governance, relational supply chain governance, transactional supply chain governance, transformational supply chain governance and performance of agro processing firms in Kenya.

Therefore, it is necessary for future researchers to undertake empirical studies in agro processing firms that may consider other moderating variables apart from information. Future studies could also be based on supply chain governance and performance of other manufacturing sub-sectors as building, mining, and construction, metal and allied industries, motor vehicles and accessories, pharmaceutical and medical equipment, among others. The comparative future studies may validate whether the findings and conclusions of this study can be generalized to the entire manufacturing industry in Kenya. Such studies will be helpful in enhancing performance of many firms in agro processing sector and the entire manufacturing industry.

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APPENDICES

Appendix I: Introductory Letter to the Respondents

Samuel Owuor Ominde

P.O. Box 9466 Code 00300

Nairobi, Kenya.

Date...../2021

Dear Respondent,

RE: DATA COLLECTION

I am a student at the Jomo Kenyatta University of Agriculture and Technology (JKUAT) pursuing Doctor of Philosophy in Supply Chain Management. I am currently conducting a research study on **supply chain governance and performance of agro processing firms in Kenya** to fulfill the requirements of the award of **PhD in Supply Chain Management**. You have been selected to participate in this study and I would highly appreciate if you assist me by responding to all questions in the attached questionnaire as completely, correctly and honestly as possible.

Please note that the information sought is purely for academic purposes and will be treated with utmost confidentiality and only used for research purposes of this study.

Thanking you in advance for your co-operation.

Yours Faithfully,

Samuel Owuor Ominde

Production Manager []

Administration/HR Manager []

5. Other (Specify).....

6. Department

PART II: Contractual Supply Chain Governance

What is your level of agreement with the following statements that relate to the contractual supply chain governance and performance of agro processing firms? Use a scale of 1-5 where strongly disagree=1, disagree=2, not sure=3, agree=4 and strongly agree=5.

	Statements	1	2	3	4	5
7.	The firm has formal contracts					
8.	Mutual contracts help the firm in task allocation					
9.	The firm uses internal rules to manage the relationships between parties to a transaction					
10.	The contracts help the firm in setting enforceable standards					
11.	The firm maintains the independent legal committees that manage firm's contracts with stakeholders					
12.	Contractual mechanisms reduce opportunism and favor relationship performance					
13.	Contracting facilitates commitment which leads to successful conflict management					
14.	Mutual trust in contracts help in managing customer and supplier relationships					
15.	The firm identify suppliers through the process of vendor rating and accreditation					
16.	The firm has long term contracts with its main suppliers					

17. In your own opinion, what are the other effects of contractual supply chain governance on performance of agro processing firms in Kenya?

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PART III: Relational Supply Chain Governance

What is your level of agreement with the following statements that relate to the relational supply chain governance and performance of agro processing firms? Use a scale of 1-5 where strongly disagree=1, disagree=2, not sure=3, agree=4 and strongly agree=5.

	Statements	1	2	3	4	5
18.	The firm manages customer relationship through regulations					
19.	Relational norms support supplier relationship					
20.	The firm maintains relational norms with stakeholders through social processes and regulations					
21.	The firm collaborate with its customers and suppliers regularly					
22.	Trust and cooperative spirit help the firm to facilitate joint planning that create a stable and committed relationship					
23.	The firm coordinate and hold regular meetings with its suppliers					
24.	The firm orient and train their customers and suppliers to build the right capacity					
25.	The firm is flexible and consider views of their suppliers to improve performance					
26.	Relational processes enhance coordination between buyers and suppliers					
27.	Relational SCG helps in smoother problem solving and restraints on unethical uses of power					

28. In your own opinion, what are the other effects of relational supply chain governance on performance of agro processing firms in Kenya?

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PART IV: Transactional Supply Chain Governance

What is your level of agreement with the following statements that relate to the transactional supply chain governance and performance of agro processing firms? Use a scale of 1-5 where strongly disagree=1, disagree=2, not sure=3, agree=4 and strongly agree=5.

	Statements	1	2	3	4	5
29.	The firm promote compliance of employees through selective incentives					
30.	The firm enhances monitoring capacity on employees to ensure performance					
31.	The firm promote compliance of employees through setting goals and punishment system					
32.	The firm encourage and support the initiatives of individual employees to explore new opportunities for the benefit of the firm					
33.	Supervision and organization play a big role in the performance of the firm					
34.	The firm provide bonuses and merits or recognition to employees when they meet certain goals					
35.	The firm uses selective incentives as a form of managerial governance to achieve the firm's goals					
36.	The firm uses monitoring capacity as managerial governance to achieve the firm's goals					
37.	Employees are encouraged to develop new products and ideas					
38.	Transactional supply chain governance enhances entrepreneurial behavior and skills of employees					

39. In your own opinion, what are the other effects of transactional supply chain governance on performance of agro processing firms in Kenya?

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PART V: Transformational Supply Chain Governance

What is your level of agreement with the following statements that relate to the transformational supply chain governance and performance of agro processing firms? Use a scale of 1-5 where strongly disagree=1, disagree=2, not sure=3, agree=4 and strongly agree=5.

	Statements	1	2	3	4	5
40.	Business culture change is important for the success of the firm					
41.	The firm promote innovations then guide, encourage, empower and facilitate employees					
42.	Employee expectation depends on setting more challenging expectations to achieve higher performance					
43.	The roles of principals and agents or the interaction situation in the firm is restructured					
44.	The firm rewards best performing employees					
45.	The firm considers views of their workers, customers and suppliers					
46.	The firm ensures that its workers have the right capacity					
47.	Transformation of a firm needs visionary and strategist managers					
48.	The manager must create an environment in which employees can accept and execute their responsibilities with confidence					
49.	Transformational SCG has helped in improving performance of the firm					

50. In your own opinion, what are the other effects of transformational supply chain governance on performance of agro processing firms in Kenya?

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PART VI: Information Flow

What is your level of agreement with the following statements that relate to the moderating effect of information flow on performance of agro processing firms? Use a scale of 1-5 where strongly disagree=1, disagree=2, not sure=3, agree=4 and strongly agree=5.

	Statements	1	2	3	4	5
51.	Information sharing on operations improves the firm's manufacturing processes					
52.	Information quality enhance the firm's manufacturing processes					
53.	Information processing capability improves the firm's supply chain performance					
54.	The firm frequently communicates with its customers and suppliers					
55.	Information flow has improved customer relationship management of the firm					
56.	The firm has an integrated information flow that led to an increase in understanding and decrease in uncertainty					
57.	The firm has rules for disclosure of information to the stakeholders					
58.	Information flow has led to the firm's operational efficiency and innovations					
59.	Information flow has reduced the firm's production costs and timelines					
60.	Information flow moderate the effect of supply chain governance on the performance of the firm					

61. In your own opinion, what are the other moderating effects of information flow on supply chain governance and performance of agro processing firmsin Kenya?

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PART VII: Performance of Agro Processing Firms

Please indicate the level of performance experienced by your firm in the last five years in terms of productivity, return of assets, market shares, sales growth, profitability, manufacturing costs, cash flow, customer satisfaction, growth, market position and product quality standards in relation to the supply chain governance by taking year 2015 as the base year. Use a scale of 1-5 where strongly disagree=1, disagree=2, not sure=3, agree=4 and strongly agree=5.

	Indicators of Performance of Agro Processing Firms	1	2	3	4	5
62.	The profitability level in terms of revenue generation was favourable for the last five (5) years					
63.	The sales growth in terms of revenue increased for the last five (5) years					
64.	Growth of market share in terms of firm's sales was registered for the last five (5) years					
65.	Productivity level in terms of output or volume increased for the last five (5) years					
66.	The return of assets level in terms of profits improved for the last five (5) years					
67.	The processing or manufacturing costs reduced for last five (5) years					
68.	The cash flow level in terms of cash and cash-equivalents being transferred into and out of a business was adequate for last five (5) years					
69.	The customer satisfaction level in terms of meeting customer expectation and loyalty improved for last five (5) years					
70.	The market position level in terms of consumer's perception of firm's products was stable for last five (5) years					
71.	Product quality standards in terms of consumers' preference was maintained for last five (5) years					

72. In your own opinion, what are the other measures of performance of agro processing firms in Kenya?

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END OF QUESTIONNAIRE

Thank you for taking your time to fill it.

Appendix III: NACOSTI Research Permit

 REPUBLIC OF KENYA	
Ref No: 661405	NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
RESEARCH LICENSE	
	
This is to Certify that Mr. Samuel Owuor Ominde of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Nairobi on the topic: Influence of Supply Chain Governance on Performance of Agro Processing Firms in Kenya for the period ending : 05/August/2021.	
License No: NACOSTI/P/20/5965	
Applicant Identification Number 661405	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
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Appendix IV: List of Agro Processing Firms

Alcoholic Beverages & Spirits (24 Firms)	
Africa Spirits Ltd, Nairobi	Agro Chemical & Food Company Ltd, Muhoroni
Crown Beverages, Ruiru Town	East African Breweries Ltd, Nairobi
Elle Kenya Ltd, Nairobi	Erdemann Co. (K) Ltd, Nairobi
Honey Care Africa Ltd, Karen, Nairobi	Jjasm Mini-Distillery, Kakamega
Kambu Distillers Ltd, Kisumu	Kedsta Investment Ltd, Nairobi
Kenya Breweries Ltd, Nairobi	Kenya Wine Agencies Ltd, Nairobi
Keroche Industries Ltd, Naivasha	London Distillers, Nairobi
Mamboleo Distillers Ltd, Kisumu	MDI Limited, Nakuru
Monwalk Investments Ltd, Nairobi	Munyiri Special Honey Ltd, Kerugoya
Pernod Ricard Kenya Ltd, Nairobi	Platinum Distillers Ltd, Nairobi
Spectre International Ltd, Kisumu	United Distillers & Vintners, Nairobi
Vinepack Ltd, Thika	Zheng Hong (K) Ltd, Nairobi
Bakers & Millers: Grain Mills (59 Firms)	
Alpha Grain Millers Ltd, Nairobi	Arkay Industries Ltd, Eldoret
Bakers Corner Ltd, Nairobi	Barex Millers Ltd, Thika
Belat Enterprises Ltd, Athi River	Bounty Ltd, Nairobi
Broadways Bakery Ltd, Thika	Brown Biashara Ltd, Mombasa
Bunge East Africa Ltd, Mombasa	Buuri Millers Enterprises, Timau, Meru
Capwell Industries Ltd, Thika	Coast Silos (K) Ltd, Mombasa
Danone Baby Nutrition Africa & Overseas, Nairobi	DPL Festive Ltd, Nairobi
East Africa Malt Ltd, Nairobi	East Africa Seed Co. Ltd, Nairobi
Eldoret Grains Ltd, Eldoret	General Mills East Africa Ltd, Nairobi
Grain Bulk Handlers, Mombasa	Grain Industries Ltd, Nairobi
Insta Products (EPZ) Ltd, Athi River	Kamili Packers Ltd, Nairobi
Kenafic Industries Ltd, Nairobi	Kenblest Ltd, Thika
Kenya Seed Company Ltd, Nairobi	Kirinyaga Flour Mills Ltd, Nairobi
Krish Commodities Ltd, Mombasa	Mafuko Industries Ltd, Meru
Mama Millers Ltd, Thika	Manji Food Industries Ltd, Nairobi
Mayfeeds Kenya Ltd, Thika	Melvin Marsh International, Nairobi
Mini Bakeries (Nbi) Ltd, Nairobi	Miritini Kenya Ltd, Nairobi
Mjengo Ltd, Thika	Mombasa Maize Millers, Mombasa
Nairobi Flour Mills Ltd, Nairobi	NesFoods Industries Ltd, Mombasa
Nicey Nicey Maize Millers, Kangari, Muranga	Norda Industries Ltd, Nairobi
Pembe Flour Mills Ltd, Nairobi	Premier Flour Mills Ltd, Nairobi
Proctor & Allan (E.A.) Ltd, Nairobi	Promasidor Kenya Ltd, Nairobi
Propack Kenya Ltd, Nairobi	Rafiki Millers Ltd, Nairobi
Royal Seed (Kenya Highlands Seed Company Ltd), Nairobi	Spice World Ltd, Nairobi
Stawi Foods & Fruits Ltd, Nairobi	Supa Snacks Ltd, Nairobi
Tropical Heat Limited, Nairobi	Tropikal Brand (Afrika) Ltd, Nairobi
Trust Feeds Ltd, Thika	T.S.S. Grain Millers Ltd, Mombasa
Umoja Flour Mills Ltd, Thika	Unga Group Ltd, Nairobi
United Millers Ltd, Kisumu	Wanji Food Industries Ltd, Nairobi
Winnie's Pure Health, Nairobi	

Cocoa, Chocolate & Sugar Confectionery (38 Firms)	
Bunge East Africa Ltd, Mombasa	Butali Sugar Mills Ltd, Webuye
C. Dormans Ltd, Nairobi	C. Czarnikow Sugar East Africa Ltd, Nairobi
Cadbury Kenya Ltd, Nairobi	Caffe Del Duca Ltd, Thika
Candy Kenya Ltd, Nairobi	Chai Trading Company Ltd, Mombasa
Chemelil Sugar Company Ltd, Kisumu	Coffee AgriworksLtd, Thika
CoffTea Agencies Ltd, Mombasa	Eastern Produce (K) Kakuzi, Thika
Global Tea & Commodities (K) Ltd	Gold Crown Beverages (K) Ltd, Mombasa
Gold Crown Foods (EPZ) Ltd, Mombasa	Italian Gelati & Foods Produce Ltd, Mombasa
James Finlay Kenya Ltd, Kericho	Juja Coffee Exporters, Mombasa
Kamili Packers Ltd, Nairobi	Karirana Estate Ltd, Limuru
Kenya Sweets Ltd, Nairobi	Kenya Tea Development Agency, Nairobi
Kenya Tea Growers Association, Kericho	Kibos Sugar & Allied Industries, Kisumu
Kwale International Company Ltd, Nairobi	Kwality Candies & Sweets Ltd, Nairobi
Melvin Marsh International, Nairobi	Mumias Sugar Company Ltd, Mumias
Mzuri Sweets Ltd, Mombasa	Nzoia Sugar Company Ltd, Webuye
Patco Industries Ltd, Nairobi	South Nyanza Sugar Company Ltd, Sare-Awendo, Migori
Supa Sweets Ltd, Nakuru	Sweet Rus Ltd, Mombasa
Valley Confectionery Ltd, Nakuru	Vava Coffee Ltd, Nairobi
West Kenya Sugar Company Ltd, Kakamega	Wrigley Company (E.A.) Ltd, Nairobi
Dairy Products (16 Firms)	
Agricultural & Veterinary Supplies Ltd (AGRI-VET), Eldoret	Agriener Agricultural Development, Nairobi
Bio Food Products Ltd, Nairobi	Brookside Dairy Ltd, Ruiru
Doinyo Lessos Creameries Ltd, Eldoret	Githunguri Dairy Farmers Co-op Society, Githunguri, Kiambu
Glacier Products (Amor Mia, Dairyland, Mio), Nairobi	Happy Cow Ltd, Nakuru
Kabianga Dairy Ltd, Kericho	Kinangop Dairy Ltd, North Kinangop
Morani Ltd, Nanyuki	New Kenya Co-operative Creameries Ltd, Nairobi
Palmhouse Diaries Ltd, Nairobi	Raka Milk Processors Ltd, Nyeri
Razco Ltd, Ruaraka, Nairobi	Sameer Agriculture & Livestock (Kenya) Ltd, Nairobi
Fresh Produce (14 Firms)	
Aquila Development Co. Ltd, Nairobi	Avoken Ltd, Nairobi
Fontana Ltd, Nakuru	From Eden, Nairobi
Groove Ltd, Naivasha	Imani Flowers Ltd, Nairobi
Kankam Exporters Ltd, Nairobi	Mahee Flowers, Nairobi
Maridadi Flowers Ltd, Naivasha	Rainforest Farmlands (K) Ltd, Naivasha
Sunland Roses Ltd, Timau	Xpressions Flora Ltd, Njoro, Nakuru
Juices / Waters / Carbonated Soft Drinks (40 Firms)	
Agri Pro-Pak Ltd, Nairobi	Almasi Beverages Ltd, Nairobi
Alpine Coolers Ltd, Nairobi	Aquamist Ltd, Nairobi
Aviano East Africa Ltd, Nairobi	Beverage Services (K) Ltd, Nairobi
Capel Food Ingredients, Nairobi	Coastal Bottlers Ltd, Mombasa
Del Monte Kenya Ltd, Thika	Dutch Water Ltd, Mombasa
East African Breweries Ltd, Nairobi	Elekea Ltd, Nairobi

Equator Bottlers Ltd, Kisumu	Europack Industries Ltd, Nairobi
Excel Chemicals Ltd, Nairobi	Gonas Best Ltd, Nairobi
Highlands Mineral Water Company Ltd, Nyeri	Jetlak Foods Ltd, Ruiru
Kevian Kenya Ltd, Nairobi	Kisii Bottlers Ltd, Kisii
Koba Waters Ltd / Bromhill Springs Water, Nairobi	Kuguru Food Complex Ltd, Nairobi
Meru Water & Sewerage Services, Meru	Milly Fruit Processors Ltd, Mombasa
Mount Kenya Bottlers Ltd, Nyeri	Nairobi Bottlers Ltd, Nairobi
Olivado EPZ, Murunga	Patco Industries Ltd, Nairobi
Pearl Industries Ltd, Nairobi	Pearly LLP, Mombasa
Premier Food Industries Ltd, Nairobi	Pride Industries Ltd, Mombasa
Pristine International Ltd, Nairobi	Promasidor Kenya Ltd, Nairobi
Rift Valley Bottlers Ltd, Eldoret	SBC Kenya Ltd, Nairobi
Scrumptious Eats Ltd, Nairobi	Sky Foods, Nairobi
Sunny Processors Ltd, Ruiru	Usafi Services Ltd, Nairobi
Leather & Footwear (10 Firms)	
Alpharama Ltd, Athi River	Athi River Tanneries Ltd, Athi River
Budget Shoes Ltd, Nairobi	C&P Shoe Industries Ltd, Nairobi
Leather Industries of Kenya Ltd, Thika	Macquin Shoes Ltd, Mombasa
Maridadi Seasons Handcraft, Malindi	Sandstorm Africa Ltd, Nairobi
Umoja Rubber Products, Nairobi	Zingo Investments Ltd, Nairobi
Slaughtering, Preparation & Preservation of Meat (13 Firms)	
Alpha Fine Foods Ltd, Nairobi	East African Sea Food Ltd, Nairobi
Farmers Choice Ltd, Nairobi	Frigoken Ltd, Nairobi
Gone Fishing Ltd, Nakuru	Heritage Foods Kenya Ltd, Athi River
Highlands Cannery Ltd, Nairobi	Kenchic Ltd, Nairobi
NAS Airport Services Ltd, Nairobi	Njoro Canning Factory (Kenya) Ltd, Njoro, Nakuru
Palmhouse Diaries Ltd, Nairobi	Promasidor Kenya Ltd, Nairobi
W. E. Tilley (Muthaiga) Ltd, Nairobi	
Textiles & Apparels (61 Firms)	
Adpack Ltd, Nairobi	Akinyi Odongo Kenya Ltd, Nairobi
Alltex EPZ Ltd, Nairobi	Alpha Knits Ltd, Nairobi
Ashton Apparel EPZ Ltd, Mombasa	Beberavi Collections Ltd, Nairobi
Bedi Investments Ltd, Nakuru	Blue Waves Enterprises Ltd, Nairobi
Brilliant Garments EPZ Ltd, Mombasa	Chalange Industries Ltd, Nairobi
Dharamshi & Co. Ltd, Nairobi	Ethical Fashion Artisons EPZ Ltd, Athi River
Fantex (K) Ltd, Nairobi	Forces Equipment (Kenya) Ltd, Nairobi
Hantex Garments EPZ Ltd, Mombasa	Insight Kenya, Nairobi
Kamyn Industries Ltd, Mombasa	Kapric Apparels EPZ Ltd, Mombasa
Kavirondo Filments Ltd, Kisumu	Kema (EA) Ltd, Nairobi
Ken-Knit (Kenya) Ltd, Eldoret	Kenya Shirts Manufacturing Company Ltd, Mombasa
Kenta Tents Ltd, Nairobi	Kenya Trading (EPZ) Ltd, Nairobi
Kikoy Co. Ltd, Nairobi	Kikoy Mall, Mombasa
Kikoy Mall EPZ Ltd, Athi River	Le Stud Ltd, Nairobi
Leena Apparels Ltd, Mombasa	Leeways Control Systems & Suppliers, Ruaraka, Nairobi,
Long-yun Garments Kenya EPZ Ltd, Mombasa	Manchester Outfitters, Nairobi

Mills Industries Ltd, Nairobi	Mombasa Apparells, Mombasa
New Wide Garments (K) Ltd, Athi River	Ngecha Industries Ltd, Nairobi
Oriental Mills Ltd, Nairobi	Panah Ltd, Nairobi
Penny Galore Ltd, Nairobi	Rivatex (East Africa) Ltd, Eldoret
Royal Garment Industries Ltd, Athi River	Long-Yun Ltd, Mombasa
Shin-Ace Garments Kenya (EPZ) Ltd, Mombasa	Simba Apparel EPZ Ltd, Mombasa
Soko EPZ Ltd, Ukunda	Spin Knit Ltd, Parklands, Nairobi
Spinners & Spinners Ltd, Nairobi	Squaredeal Uniforms Centre Ltd, Eldoret
Straightline Enterprises, Nairobi	Summit Fibres Ltd, Mombasa
Sunam Shakti, Ruaraka, Nairobi	Sunflag Textile & Knitwear Mills Ltd, Nairobi
Tarpo Industries Ltd, Nairobi	Teita Estate Limited, Nairobi
Thika Cloth Mills Ltd, Thika	TSS Spinning & Weaving Ltd, Nairobi
Tulips Collections Ltd, Nakuru	United Aryan (EPZ) Ltd, Nairobi
Vajas Manufacturers Ltd, Nairobi	Wildlife Works (EPZ) Ltd, Voi
World of Kikoys, Mombasa	
Timber, Wood & Furniture (26 Firms)	
African Retail Traders, Nairobi	Biashara Master Sawmills, Nakuru
Budget Furniture Ltd, Nairobi	Comply Industries Ltd, Nakuru
Contrive Industries Ltd, Nairobi	Economic Housing Group Ltd, Nairobi
Elburgit Enterprises Ltd, Elburgon	Fine Wood Works Ltd, Nairobi
Fun Kidz, Nairobi	Furniture International Ltd, Nairobi
Kenya Wood Products Ltd, Nairobi	Little Cribs Ltd, Nairobi
Major Furniture, Mombasa	Newline Ltd, Nairobi
Panesar's Kenya Ltd, Nairobi	PG Bison (K) Ltd, Nairobi
Rai Plywoods (Kenya) Ltd, Eldoret	Rosewood Furniture Manufacturers Ltd, Nairobi
Savannah Saw Mills, Eldoret	Shamco Industries Ltd, Nairobi
Shayona Timber Ltd, Nakuru	Timber Treatment International Limited, Eldoret
Timsales Ltd, Nairobi	Turea Ltd, Ruiru
Wood Makers (K) Ltd, Nairobi	Woodtex Kenya Ltd, Nairobi
Tobacco (3 Firms)	
Alliance One Tobacco Kenya Ltd, Thika	British American Tobacco Kenya Ltd, Nairobi
Mastermind Tobacco (K) Ltd, Nairobi	
Vegetable Oils (40 Firms)	
Agricultural & Veterinary Supplies Ltd (AGRI-VET), Eldoret	Al-Mahra Industries Ltd, Nairobi
Bidco Africa Ltd (Bibco Oil Refineries Ltd), Thika	Centrofood Industries Ltd, Thika
Chirag Kenya Ltd, Nairobi	Crown Beverages, Ruiru Town
East African Seed Co. Ltd, Nairobi	Edible Oil Products Ltd, Nairobi
Elle Kenya Ltd, Nairobi	Fresh Produce Exporters Association of Kenya, Nairobi
Frigoken Ltd, Nairobi	FRM EA Packers Ltd, Nairobi
Giloil Company Ltd, Nairobi	Global Fresh Ltd, Nairobi
Green Forest Foods Ltd, Nairobi	Jetlak Foods Ltd, Ruiru
Kamili Packers Ltd, Nairobi	Kappa Oil Refineries Ltd, Nairobi
Kentaste Products Ltd, Mombasa	Kenya Highland Seed Company Ltd, Nairobi
Kenya Horticultural Exporters (1977), Nairobi	Kenya Nut Company Ltd, Nairobi
Kenya Seed Company Ltd, Nairobi	Menengai Oil Refineries Ltd, Nakuru
Monwalk Investments Ltd, Nairobi	Palmhouse Diaries Ltd, Nairobi

Pernod Ricard Kenya Ltd, Nairobi	Platinum Distillers Ltd, Nairobi
Premier Food Industries Ltd, Nairobi	Promasidor Kenya Ltd, Nairobi
Pwani Oil Products Ltd, Mombasa	Selecta Kenya Gmbh & Sons. KG, Nairobi
Spice World Ltd, Nairobi	Tropical Heat Ltd (Deepa Industries Ltd), Nairobi
Tropikal Brand (Africa) Ltd, Nairobi	Trufoods Ltd, Nairobi
Ultravetis East Africa Ltd, Nairobi	Valuepak Foods, Nairobi
Vert Ltd, Nairobi	Zheng Hong (K) Ltd, Nairobi

Source: Kenya Manufacturers and Exporters Directory of 2019