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SUPPLY CHAIN AGILITY AND PERFORMANCE OF HORTICULTURE EXPORTING FIRMS IN KENYA

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ABSTRACT

Any firm needs clients because without them, there would be no money. Organizations are battling to thrive in the extremely competitive business world of today as Product Lifecycles have gotten shorter, clock-speed has gotten faster, and the ramifications of disenchanting a consumer have gotten worse. Despite the overwhelming evidence which shows the advantages of customer centric procurement, not a single study has focused on influence of supply chain customer centric on performance of horticulture exporting firms in Kenya. The specific objectives were to; establish the effect of supply chain agility on performance of horticulture exporting firms in Kenya; and the moderating effect of regulatory framework compliance on supply chain agility and performance of horticulture exporting firms in Kenya. The study was guided by Contingency theory. Descriptive and causal-comparative research design designs were used. The target population was all 236 horticulture exporting firms in Kenya. The unit of analysis were horticulture exporting firms while the unit of observation was supply chain managers. The study used a census approach and therefore the target population was the 236 supply chain managers in horticulture exporting firms. Semi-structured questionnaires and data collection tools were used for data collection. Qualitative data collected were analysed using content analysis and presented in prose form. Qualitative data was analysed using SPSS version 26 where descriptive statistics such as such as frequency distribution, mean (measure of dispersion), standard deviation, and percentages were used. The study also computed inferential data analysis which included regression analysis and Pearson correlation coefficient analysis. The findings were presented in tables and figures. The study found that supply chain agility was found to positively and significantly relate with performance of horticulture exporting firms in Kenya. In addition, regulatory framework compliance had significant moderating effect on the relationship between supply chain agility and performance of horticulture exporting firms in Kenya. Therefore, it is recommended that horticulture exporting firms in Kenya invest in these factors to enhance their performance. Specifically, they should increase their supply chain agility and ensure compliance with the regulatory framework. Future research should focus on examining the specific strategies and practices that firms can adopt to improve these supply chain factors and their impact on performance.

Key Words: supply chain agility, regulatory framework, performance, horticulture exporting firms

Background of the Study

Organizations are battling to thrive in the extremely competitive business world of today as Product Lifecycles have gotten shorter, clock-speed has gotten faster, and the ramifications of disenchanting a consumer have gotten worse (Bolton & Lemon 2019). Because these qualities have an impact on their performance, firms are searching for strategies to become more innovative, competitive, and creative. Different factors have an impact on how well companies succeed. Customer-centric performance is among such factors and it involves how customers view the organization's performance (Anderson, 2016). Customer-centric performance is demonstrated by dependability, responsiveness, rapid delivery, customization, and customer pleasure (Evans & Lindsay, 2017). In the corporate world, slogans like "The Customer Comes First" or "The Customer Is King" are fairly prevalent. These catchphrases are employed to highlight the importance of the customer to various parties, including the management and staff of a service organisation (Olsen et al., 2018).

Since efficiency-based, cost-saving supply chains are more prone to unanticipated changes in consumer demand, the conventional supply chain approach that views customers as the final goal of all supply chain activities is no longer appropriate (Lee, 2018). In today's economy, supplier chains compete with one another rather than individual businesses (Farahani et al., 2018). The outdated focus of the supply chain has traditionally focused on how to lower operational costs for businesses through increased efficiency in the processes of production planning, outsourcing, and logistics. Increased productivity across the whole supply chain can boost a company's competitiveness, but it won't guarantee success. The argument is that increasing efficiency alone won't enable the business to distinguish its goods and services from those of its competitors (Roh *et al*., 2018).

In horticulture businesses, customer-centric supply chain operations are the procedures or methods used to meet customers' expectations (Omur, 2020). Implementing these principles gives a firm competitive advantage in terms of performance, allowing it to either maintain its existing place in the market or advance among its rivals. Managing customised value-added products, communicating real-time information with suppliers and consumers, on-time delivery, and supply chain innovations are a few examples of these techniques.

Agility is a vital component of the customer-centric supply chain due to customer demand for ever-faster deliveries. An asset-light supply chain model aids in reassessing the physical length of their supply chains and the proximity to which they can deliver customer satisfaction and other agile components (Bonde & Bruno, 2019). Due to rising competition from other producing nations, Kenya's competitiveness in the horticultural export market has decreased as a result. Fresh horticulture product trade has expanded to a more global scale. Kenya has 236 licenced horticulture export companies (Agriculture and Food Authority, 2020). To remain competitive in today's market, horticulture exporters must make their supply chains more customer-driven. They must take into account consumer perception if they want to increase their market share globally.

Statement of the Problem

Horticulture forms an integral and important component in the economy of a nation. Kenya's agricultural industry makes a significant contribution to the country's GDP. Kenya's economic growth has been mainly dominated by the agriculture sector, with the horticulture subsector (fruits, cut-flowers and vegetables) being the third leading contributor to agricultural GDP after dairy and tea (KNBS, 2022). The horticulture sector in Kenya contributes significantly to the Gross Domestic Product (GDP) and provides employment to more than six million Kenyans directly and indirectly. The sector also provides raw materials to the manufacturing sector and has higher farm profitability due to higher production and export earnings from foreign exchange. For instance,

horticulture export earnings in Kenya rose from Ksh 115.3 Billion in 2017 to a high of Ksh 157.7 Billion in 2021, an increase of Ksh 42.4 Billion making it one of the largest single contributors to the growth of the economy. Overall, Uganda remains Kenya's main export destination accounting for 12.3 per cent of total export earnings in 2021. Between 2020 and 2021 Kenya's exports to Tanzania and the DRC increased from Ksh 31.8 billion and Ksh 14.3 billion in 2020 to Ksh 45.6 billion and Ksh 24.4 billion, respectively. This increase was mainly due to a rise in domestic exports of tea, cut flowers and coffee to the Democratic Republic of Congo and soap to Tanzania. However, merely 4% of Kenya's total horticulture produce—fruits and vegetables is exported, with 96% remaining in the country for local consumption. Although Kenyan farmers have greater options to sell their products in foreign markets including the USA exporters must adhere to all set rules and regulations and meet the quality required for export. Horticultural exporting firms are under a lot of pressure to provide top-notch goods and services in order to satisfy the constantly shifting demands of international clients.

Even though Kenya is the most successful producer and exporter of fresh produce and flowers in sub-Saharan Africa, other African nations and those on other continents also present fierce competition that may eventually capture a significant portion of the global horticulture industry. The market share globally has also declined by 2% from 2017-2021 and the growth in value added horticultural products from 5by 1.6% in the same period. The decline has been attributed to multiple taxation locally and internationally, high cost of agricultural inputs, competition from developed countries that have fully embraced technology in horticultural production, high cost of power, logistics challenges, and change in consumer tastes and preferences (Fresh Produce Exporters Association of Kenya, 2021). According to Awour's (2016) study on the impact of customer orientation on the fruit exporting businesses in Nairobi City County, customer orientation is a source of fresh thinking and creativity that can help businesses adapt to changing consumer expectations. According to a study by Muse, Njeru, and Waiganjo (2016), local horticulture firms are having trouble expanding their market share abroad because they only hold 18 percent of the market, which represents their appalling performance in the foreign market compared to Egypt, Ivory Coast, and Zimbabwe, which have market shares of 23, 20, and 19 percent, respectively. Gathigia (2016) issued a warning against the shrinking market share of local horticulture exporters in foreign markets despite the existence of a ready market for horticultural products, which could result in the closure of some businesses, which would cause job losses and a loss of revenue for the nation. However, none of the existing studies in Kenya focuses on customer centric supply chain practices and performance of horticulture export firms. This creates a scope gap which this study sought to establish the effect of customer centric supply chain practices (supply chain agility) on performance of horticulture exporting firms in Kenya.

Specific Objectives

i. To assess the effects of supply chain agility on performance of horticulture exporting firms in Kenya.
ii. To examine the moderating effect of regulatory framework compliance on relationship between supply chain agility and performance of horticulture exporting firms in Kenya.

Research Hypothesis

H_{01}: There is no significant relationship between supply chain agility and performance of horticulture exporting firms in Kenya

H_{02}: There is no statistically significant moderating effect of regulatory framework compliance on the relationship between supply chain agility and performance of horticulture exporting firms in Kenya.

Theoretical Review

Contingency Theory

Contingency theory was created by Lawrence and Lorsch in 1967. According to the theory, there isn't a single set of management concepts that can be used to govern businesses in all situations. Each organisation is unique, faces unique challenges (contingency factors), and needs a unique approach to management. According to Wren (2005), there is no ideal structure for a business, no ideal leader for a corporation, and no ideal process for making decisions. Instead, the best course of action depends on the circumstances both inside and outside the body. According to the contingency theory's central tenet, organisations operate best when their characteristics—such as technology, size, and strategy—are matched to eventualities that accurately reflect their situation (Donaldson, 2017).

According to Burns and Stalker's (2017) argument, various technical settings call for corresponding management systems. For instance, an organic structure (flexible, decentralised structure) is better suited to a changing environment than a mechanistic structure (centralised structure), which is better suited to a stable environment. Structures in organisations are said to follow strategy (Friesl & Kwon, 2016). The strategy is what determines the long-term goals, objectives, actions, and resource allocation. The structure is how the organisation is set up to implement the strategy, hierarchies and lines of authority. Organizational structure will eventually alter to meet these objectives as various tactics generate various administrative requirements.

According to the contingency theory, there are no universal management principles, but one may learn about management by handling a variety of case study circumstances and figuring out what will work in each one (Wren, 2005). This is accurate because every manufacturing company faces a particular special issue. This idea is crucial for manufacturing companies since it calls on managers to apply various managerial techniques in order to be adaptable and boost company performance. Manufacturing company managers need to put pre-determined contingency plans into action so they can react quickly with the right mitigation measures, allowing them to recover quickly by minimising the consequences of the disruption.

Managers should enhance agility and flexibility through increased supply chain visibility from effective communication and information sharing in real-time among supply chain partners (such as demand and inventory levels) in order to better detect threats and launch response mechanisms with increased speed (Purcell, 2007). In order to better detect threats and launch response mechanisms with increased speed, managers should improve agility and flexibility through supply chain clarity achieved through constant communication with suppliers and customers as well as sharing information with the supply chain stakeholders.

In order to minimize expenses, enhance receptiveness for modifying the supply chain, Chopra and Sohi (2014) suggest managers to segment and regionalize supply networks (depending on volume, product diversity, and demand unpredictability). This will lead to excellent firm performance. In order to attain organisational success, managers in horticulture organisations must utilise tactics that are suited to the organisational circumstances, including SC integral relationships. This is where contingency theory comes in. This is backed up by Braunscheidel and Suresh's (2009) claim that organisations can increase performance by strengthening the SC integral relationship. This theory was therefore used to explain how the performance of Kenya's devolved units of government is affected by supply chain agility and transformation

Conceptual Framework

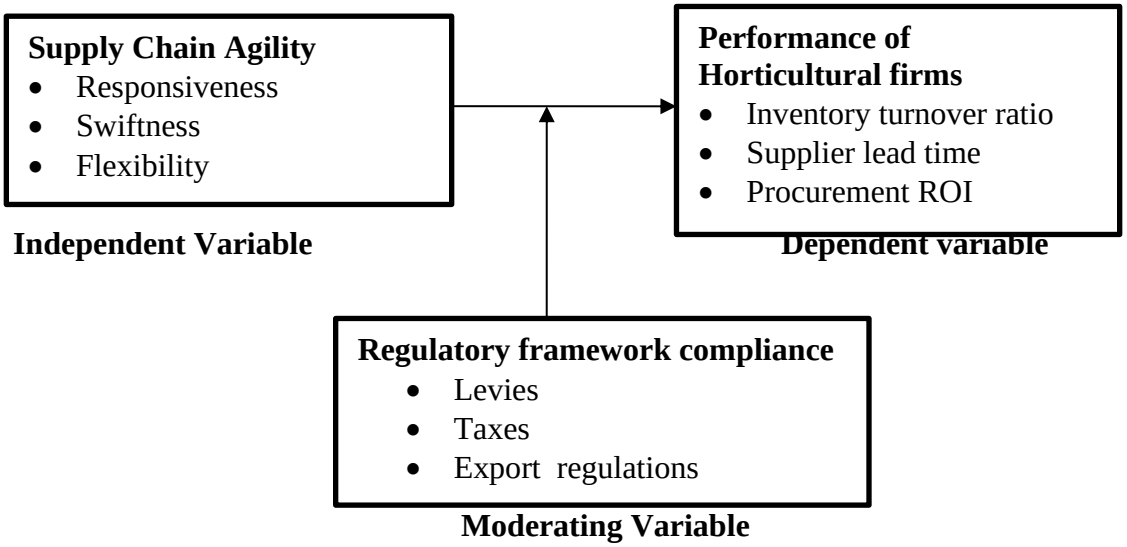

Figure 1: Conceptual Framework

Supply Chain Agility

Wilding et al. (2016) argued that agility is among the most crucial challenge facing modern supply chain management. Increasing speed and flexibility in the supply chain is the emphasis of the operational strategy known as supply agility (Balaji, Velmurugan, & Subashreeet, 2017). Supply chains' ability to adapt to market changes to remain competitive is known as supply agility (Mulyati, 2020). Supply agility is a growing dynamic competence that is crucial in the current entrepreneurial climate (Meyer et al., 2017). Theoretically, supply chain agility lacks a solid foundation because agility is a multifaceted notion with numerous components (Gligor, 2016).

The capacity to react promptly to requests is agility in the supply chain. For businesses to sustain competitiveness and have shorter life cycles where they must continuously innovate and produce new products and services, supply chains must be agile enough to deal with changes in supply and demand. Agility encompasses a variety of ideas, such as adaptability, awareness, rapidity, assertiveness, and accessibility (Wilding et al., 2016). Since they are crucial to agility's success, flexibility and mindfulness have emerged as the most significant concepts related to it (Caglar Kalkan & Aydn, 2020). Hendricks, Singhal, and Stratman (2017) claim that in order to assess supply agility, four factors are required, namely cycle time, lead time, customer service level, and market responsiveness.

According to Lee (2018), the three critical business imperatives in the most effective supply chains are agility, flexibility, and alignment. As the industry leader, SC agility integrates customer sensitivity, organisation, procedures, networks, and information systems while placing more of an emphasis on "service level" than "cost" (Christopher & Peck, 2018). This is seen as a tool that streamlines information flow into a condensed, more immediate setting. Small and medium-sized businesses have realized the need to strategically manage their relationships with suppliers and customers as a means of improving product and customer satisfaction If partnerships with supply chain partners are successful and result in desired return on investments versus competitors, they may gain competitiveness. However, businesses also need to examine if the advantages of customer centricity are long lasting (Nyaga & Whipple, 2017). According to numerous studies, dedication and trust are essential elements that fully satisfy the connection between suppliers and merchants (Sun, Liu, & Yang, 2018).

Kwon and Suh (2018) contend that the importance of trust and steadfast commitment between supply chain participants is what makes supply chain performance successful. Conversely, low

levels of commitment and trust may contribute to a supply chain that performs poorly (Mukhsin & Suryanto, 2021). According to Meyer et al. (2017), supply chain agility has been acknowledged by various scholars and procurement professionals as a crucial component of successful companies. Despite this, agility has not been properly defined by scholars hence a dearth of resources, which furthers its ambiguous nature. They contend further that more supply chain agility is necessary for better supplier integration, inventory management, and the ability to respond quickly to customer needs. Organizations will gain several benefits by implementing trust and commitment in the supply chain, benefits that might be helpful for the sustainability of their business. Developing a sound approach that keeps suppliers and customers involved in the supply chain.

Regulatory Framework Compliance

A political party or organisation may adopt a plan of action to decide the scope of its operations. Another definition of a policy is a set of guiding principles or plans that serve as the foundation for decision-making (Akinyemi & Adejumo, 2018). A regulatory framework, according to Awino and Marendi-Getuno (2014), consists of the laws, rules, and policies put in place to oversee an organisation or an activity. A good policy regulatory framework in the procurement process contributes to organization performance. When organization operate within the environment of honesty, fairness, and fair competition, they have better chances of delivering quality products and high performance (Schapper, Veiga & Gilbert, 2016). According to Koech and Namusonge (2015), compliance with procurement regulatory framework plays an important role in improving organization performance through transparent and professional procurement.

An organization's understanding of public entrepreneurship can be improved by a necessary and effective government policy (Akinyemi & Adejumo, 2018; Obaji & Olugu, 2014). In order to meet new demands for public service and to encourage a business oriented attitude in diverse public institutions, it is believed that the responsibility of government is to adopt creative and aggressive public policies. As a result, public entrepreneurship appears to quickly improve public organisational performance through quality service delivery (Kareem &Haseeni, 2015; Sandfort, Selden, & Sowa, 2008). The government's efforts to create a favourable business climate for horticulture exporting enterprises and ultimately to improve their performance are the main subject of this research study.

Export Performance

Export performance is a firm's actions in export markets. Additionally, it refers to the firm's success in the global market through volume of exported products. Growth of export sales, export performance, export sales volume, market share, and export profits are common indicators of export performance (Kimutai, & Awuor, 2016). According to Ayse and Akehurst (2003), both subjective and objective metrics may be used to measure an organization's export performance because they both produce reliable data. They pointed out that whereas subjective metrics focus on how well a business is performing relative to its top competitors or to its own expectations, objective measures are more focused on actual performance indicators.

According to a study by Mania and Rieber (2019), a nation's exports are crucial because they serve as a foundation for the expansion of its economy, which is fueled by higher foreign exchange revenues. According to Muendo, Tschirley, and Weber (2016), considering its rapidly expanding export sector in significant importing nations like European countries and United States of America, horticulture production in Kenya has drawn significant interest from international NGOs and Governments. It is clear that horticultural exports in Kenya contribute significantly to economic growth by creating jobs, bringing in foreign cash, and attracting investment. The increase in air freight arrivals at Kenya's main export destinations has contributed to the country's growth in the exportation of high-quality horticulture products. The decline in horticultural

exports, on the other hand, has been closely linked to unpredictable weather patterns that led to low yields, a lack of technology that adds value, an increase in post-harvest losses, and horticultural farmers inability to procure planting materials of the right quality (Nayioma, 2016). To evaluate the direct and indirect implications of such partnerships, this research study concentrates on the effects of customer-centric supply chains on company performance.

Empirical Review

Supply Chain Agility and Performance

Cecere (2016) aimed to determine how manufacturing companies perceived the deployment of an agile supply chain. Majority of the firms sampled (89%) had benefitted from implementation of an agile supply chain strategy. The researcher however found that few of them were aware of how it improved supply chain performance. Gligor (2016) conducted study on the performance consequences of SCA and found that efficient resource allocation improves firms' supply chains' agility and, as a result, the operations of the firms' bottom line.

Um (2017) examined supply chain agility and firm profitability. The study employed a survey research design. The sample size was 156 manufacturing firms. The findings imply that supply chain agility has a favourable impact on customer service and differentiation. However, it doesn't directly impact corporate performance; instead, it can be mediated and increased through better customer service and distinctiveness. The best approach to boost corporate success is through distinction through customer service, and supply chain agility may assist deliver top-notch customer service. The document offers managers tips on how to implement essential agile supply chain management activities to better achieve their business performance goals.

Heim (2017) found that supply chain strategy have a significant correlation with supply chain performance of firms in Peru. Sukati et al. (2016) focused on supply chain agility and performance of manufacturing firms in Malysia. The sample was 150 firm managers sampled from 40 manufacturing firms. Results showed a significant nexus between relationship with suppliers through involving them in the supply chain and firm profitability. Gunasekaran (2019) based agility on four fundamental principles: providing highly valued services/products, being adaptable to dynamics, appreciating staff competencies and abilities, and establishing online collaborations.

Mukhsin and Suryanto (2021) researched on effect of supply agility mediation on supply chain performance in Indonesia using a sample of 100 chicken meat vendors sampled purposively. Findings showed that trust was not significantly to supply chain performance, commitment was significantly related to supply chain performance, trust was significantly related to supply agility, commitment significantly related to supply agility, and supply agility significantly related to supply chain performance.

Hong, Zhang, and Ding (2018) researched on supplier management practices in USA. The target was 205 top leaders of manufacturing firms. The study discovered that supply chain integration was favourably correlated with lean (agile) supplier management methods (flexibility). As shown by a favourable moderating effect of IS for Efficiency on the link between lean supplier practises and supply chain integration, alignment of lean supplier practises with IS for Efficiency increases supply chain integration.

Regulatory Framework Compliance and Performance

Karnsomdee (2021) examined how government policies affected performance of public organizations in Thailand. Data was collected from 216 public officers using questionnaires. Findings showed that government policies are significantly related to organization performance. Moshi and Kilindo (2019) studied effect of government policies on macroeconomic variables in private companies in Tanzania. Findings revealed that government spending on investments affect rate of foreign exchange, economic growth, and capital flows. The findings support the idea that

public expenditure, particularly in road construction, has a considerable and favourable impact on private investment. Additionally, the availability of foreign currency influences private investment favourably. The government of Tanzania's policies, which have been in place since 1986, have been proven to have increased economic private investment.

Francis, Mulvey and Keith (2018) conducted a study to examine the impacts of regulation on growth-oriented small and micro-businesses in the North West region of England. The study targeted 15 business with less than 50 employees. The data was collected using interview guides whereby 15 managers were interviewed. The managers pointed out that sometimes regulations are not enforced adequately and they are applied inconsistently to the disadvantage of small businesses that seek to grow by offering high quality products and services

Nyarku and Oduro (2017) study sought to explore the effect of legal and regulatory frameworks on small and medium enterprises (SMEs) growth in Ghana. The target population was 382 business owners. Primary data was collected using questionnaires. The results were analysed using structural equation model-partial least square. Findings established that bureaucracy, unstable policy climate, unfriendly customs and trade regulations, tight monetary and credit policies, corruption and excessive tax regimes, workforce and labour regulations have a negative effect on SMEs growth in Ghana.

Munjeyi (2017) conducted a study to assess the impact of legal and regulatory framework on SMEs development in Zimbabwe in the 21st century. The study used secondary data collected from journals, newspaper articles, books, government websites and policy documents. Findings established that; there are multiple of regulatory to be followed by a start-up SMEs, the burdensome procedure for registering and commencing business are key deterrent to SMEs growth and development in Zimbabwe and hostile tariffs has propelled many SMEs into informal sector (black economy) as a strategy to sustain their lives and stay in business

RESEARCH METHODOLOGY

The study used a mixed research design approach whereby both descriptive and a causal-comparative research designs were used. The study targeted 236 registered horticulture exporting firms in Kenya as at 10th December, 2020 (AFA, 2020). Therefore, the unit of analysis was horticulture exporting firms in Kenya. The unit of observation was supply chain managers because they are directly involved with supply chain and are best suited to provide information needed on the influence of customer centric supply chain and performance of devolved unit of governance in Kenya. Therefore, the study population was 236 supply chain managers. This study adopted stratified random sampling technique to sample 150 procurement managers. The study used primary and secondary data. With the use of the Statistical Package for Social Sciences, descriptive and inferential statistics were used to analyse quantitative data (SPSS version 26). Descriptive statistics included percentages, frequency distribution, mean (a measure of dispersion), and standard deviation. Regression analysis and Pearson correlation coefficient analysis were used to undertake inferential data analysis.

RESEARCH FINDINGS

The sample size for the study was 150 supply chain managers of horticulture exporting firms in Kenya. The returned questionnaires were crosschecked for accuracy and completeness and 139 were found to be valid and reliable and could be used for further analysis and reporting. The returned questionnaires formed a response rate of 92.7%. As explained by Sekaran and Bougie (2016), a response rate of 50% and above is adequate for analysis, 60% and above is good while that of 70% and above is excellent. Therefore, the response rate of 92.7% was excellent for further analysis and reporting.

Descriptive Analysis

Supply Chain Agility

The first objective of the study was to assess the effects of supply chain agility on performance of horticulture exporting firms in Kenya. On this objective, respondents were asked to rate their firm responsiveness to customers' needs. Table 4.1 presents summary of the findings obtained. their responsiveness are likely to achieve better performance outcomes in the long run.

Table 1: Firm's Responsiveness to Customers' Needs

Firm's Responsiveness to Customers' Needs	Frequency	Percent
Very High	42	30.2
High	77	55.4
Fair	13	9.4
Poor	5	3.6
Very poor	2	1.4
Total	**139**	**100.0**

The findings showed that majority (55.4%) and 30.2% of the horticulture exporting firms in Kenya have high and very high responsiveness to customers' needs respectively. The findings indicate that a majority of the firms have a high or very high level of responsiveness. Findings are in line with of the contingency theory which supports that organisations can increase performance by strengthening the supply chain integral relationship. This would be through eliminating constraints that would negatively affect the quality of horticultural products leading to poor customers' rating. This is consistent with research has shown that customer responsiveness can lead to increased customer satisfaction, loyalty, and retention, which can in turn lead to increased sales revenue and profitability for firms (Gruen, Summers, & Acito, 2020). Furthermore, firms that are responsive to customer needs are better able to identify and respond to changes in customer preferences and market trends, which can help them stay competitive and adapt to changing market conditions (Ahearne, Jelinek, & Rapp, 2017). However, achieving a high level of responsiveness requires a strategic approach to customer service and effective communication and coordination with all relevant stakeholders, including customers, suppliers, and intermediaries (Chen & Li, 2012). Therefore, firms that prioritize customer needs and invest in strategies to improve.

Respondents were further asked to indicate their level of agreement on the statements on firm supply agility. Table 2 presents summary of the findings obtained.

Table 2: Descriptive Statistics on Supply Chain Agility

Statements	Mean	Std. Dev.
The supply chain process is flexible enough to forecast potential threats from the market.	3.971	0.928
The firm has the capability to meet customers' expectations in a timely manner in terms of on-time delivery.	3.908	0.652
The firm strives to ensure timely introduction of new products to meet market requirements and expectations	3.823	0.43
The firm is well-equipped to respond to possible changes in its customers' demands	3.767	0.987
The management makes more responsive changes while considering the market	3.705	0.769
The firm has the necessary technological and technical capabilities to incorporate additional changes to meet customers' expectations	3.684	0.278
The firm is market sensitive with capacity to flexibly adapt to the fast changing business environment	3.602	0.376
The firm has invested in product research and development	3.6	0.533
Aggregate Score	**3.758**	**0.619**

The findings show that the respondents agreed that the supply chain process is flexible enough to forecast potential threats from the market (M= 3.971, SD= 0.928); that the firm has the capability to meet customers' expectations in a timely manner in terms of on-time delivery (M= 3.908, SD= 0.652); and that the firm strives to ensure timely introduction of new products to meet market requirements and expectations (M= 3.823, SD= 0.43). They were also in agreement that the firm is well-equipped to respond to possible changes in its customers' demands (M= 3.767, SD= 0.987), that the management makes more responsive changes while considering the market (M= 3.705, SD= 0.769); and that the firm has the necessary technological and technical capabilities to incorporate additional changes to meet customers' expectations (M= 3.684, SD= 0.278). Further, they agreed that the firm is market sensitive with capacity to flexibly adapt to the fast-changing business environment (M= 3.602, SD= 0.376) and that the firm has invested in product research and development (M= 3.6, SD= 0.533).

Based on the findings above and supported by an aggregate mean of 3.758 (SD= 0.619), it is evident that supply chain agility affects performance of horticulture exporting firms in Kenya. According to the contingency theory, there are no general management principles but organizations are managed based on different situations. Therefore production can be managed based on the market agility. The finding is consistent with studies that have shown that supply chain agility is a key determinant of firm performance, particularly in industries with high levels of competition and volatility (Christopher & Peck, 2018). Agile supply chains enable firms to respond quickly to changes in demand or supply, reducing lead times, inventory levels, and production costs, and improving customer satisfaction and loyalty (Gunasekaran & Ngai, 2019). In the context of horticulture exporting firms in Kenya, supply chain agility is particularly important given the dynamic nature of the industry and the challenges associated with exporting perishable products to international markets. Horticulture exporting firms must be able to respond quickly to changes in customer demand, regulatory requirements, and transportation and logistics issues in order to maintain their competitive advantage and achieve superior performance outcomes. Therefore, firms that prioritize agility and invest in strategies to improve their responsiveness and flexibility are likely to achieve better performance outcomes in the long run.

Regulatory Framework Compliance

The second objective of the study was to examine the moderating effect of regulatory framework compliance on relationship between supply chain agility and performance of horticulture exporting firms in Kenya. On this objective, respondents were requested to describe firm's compliance to regulatory framework. Table 3 presents summary of their findings.

Table 3: Firms' Compliance to Regulatory Framework

Regulatory Framework Compliance	Frequency	Percent
Levies	135	97.1
Taxes	120	86.3
Compliance to import regulations	130	93.5

The findings show that majority of the horticulture exporting firms in Kenya are compliant with regulatory framework specifically levies, taxes, and compliance with import regulations. According to systems, organisations are dependent on their environment. The horticultural firms operates in an environment that is high regulated by the government and the other quality assurance bodies to ensure that only quality products are exported. This is consistent with Blumberg and Flynn (2019) that international trade regulations are essential for ensuring fair and ethical trade practices, protecting consumers and the environment, and promoting economic growth and development. Also, compliance with these regulations is crucial for firms that engage in international trade, as non-compliance can lead to significant financial and reputational damage, legal penalties, and even loss of business (Coviello et al., 2015).

In the context of horticulture exporting firms in Kenya, compliance with levies, taxes, and import regulations is particularly important, as these firms rely heavily on international trade to generate revenue and remain competitive. Failure to comply with these regulations can result in delays and disruptions to their supply chains, affecting their ability to meet customer demands and compete effectively in global markets. Moreover, compliance with regulatory frameworks is not only essential for avoiding penalties and legal sanctions but also for building trust and credibility with customers and stakeholders. Compliance is often viewed as an indicator of a firm's commitment to ethical and responsible business practices, which can enhance its reputation and competitive advantage (Prashantham et al., 2019). There is therefore the need for horticulture exporting firms in Kenya to adopt robust compliance programs and procedures to ensure that they meet their regulatory obligations.

On the same objective, respondents were asked to indicate their level of agreement on the statements on regulatory framework. Table 4 presents summary of the findings obtained.

Table 4: Descriptive Statistics on Regulatory Framework Compliance

Statements	Mean	Std. Dev.
Policy framework ensures adherence to ethical procurement conduct	4.019	0.895
Ease of regulatory framework on horticultural exporting increases exporting capacity	3.93	0.664
Government offers research and extension services to horticulture exporting firms	3.861	1.018
The firm operate within the environment of honesty, fairness, and fair competition	3.725	0.572
Government assists in marketing and promotion of Kenya's horticultural products in the global market	3.698	0.726
Respecting criteria when issuing certificates for export helps acceptability of Kenyan horticultural produce abroad	3.638	0.409
Aggregate Score	**3.812**	**0.714**

Based on the findings the respondents agreed that policy framework ensures adherence to ethical procurement conduct (M = 4.019, SD= 0.895); that there is ease of regulatory framework on horticultural exporting increases exporting capacity(M= 3.93, SD= 0.664); and that government offers research and extension services to horticulture exporting firms (M= 3.861, SD= 1.018). They were also in agreement that the firm operate within the environment of honesty, fairness, and fair competition (M= 3.725, SD= 0.572); that government assists in marketing and promotion of Kenya's horticultural products in the global market (M= 3.698, SD= 0.726); and that respecting criteria when issuing certificates for export helps acceptability of Kenyan horticultural produce abroad (M= 3.638, SD= 0.409).

The findings above supported by an aggregate mean of 3.812 (SD= 0.714) show that regulatory framework compliance affects relationship between customer centric supply chain practices and performance of horticulture exporting firms in Kenya. The performance of the firms depends on the joint efforts of all stakeholders and departments rather than just one department which is in support of the systems theory. The horticulture firms must abide by the laws and regulations set the by industry regulators. This agrees with Karnsomdee (2021) who suggests that regulatory compliance is an important factor in the success of supply chain management practices in different industries. In the horticulture industry, compliance with regulations related to quality standards, export procedures, and product labelling is critical to maintain customer trust and satisfaction. Failure to comply with these regulations can lead to legal penalties, loss of market share, and damage to the firm's reputation. The study's findings suggest that compliance with regulatory

frameworks is an important factor to consider when implementing customer-centric supply chain practices in horticulture exporting firms in Kenya. Firms that comply with regulations related to levies, taxes, and import regulations are more likely to achieve better performance outcomes when implementing customer-centric supply chain practices. This highlights the importance of a comprehensive approach to supply chain management that considers regulatory compliance as a critical aspect of overall performance.

Firm Performance

The main objective of the study was to establish the effect of supply chain agility on performance of horticulture exporting firms in Kenya. Therefore, on a scale of 1-5 (**5**-Very high, **4**-High, **3**-Moderate, **2**-Poor, **1**-Very poor) respondents were asked to rank their organization's performance aspects. Table 5 presents findings.

Table 5: Descriptive Statistics on Firm Performance

Performance indicators	Mean	Std. Dev.
Market share	4.04	0.502
Sales volume	4.032	0.786
Sales growth	4.027	0.805
Profitability	3.854	0.49
Clients/supplier satisfaction	3.647	0.211

The findings show that the highest ranked performance indicator is market share, with a mean of 4.04, indicating that the respondents perceive their organization's market share to be very high. This is followed by sales growth and sales volume, both of which have means above 4, indicating that the respondents perceive their organization's sales to be growing and the volume to be high. Profitability also has a high mean of 3.854, indicating that the respondents perceive their organization's profitability to be high, but slightly lower than the other performance indicators mentioned above. Client/supplier satisfaction has the lowest mean of 3.647, indicating that the respondents perceive their organization's client and supplier satisfaction to be moderate.

The findings are consistent with Augusto and Bastos (2018) that market share, sales growth, and sales volume are important performance indicators in the horticulture industry. Profitability is also an important indicator, as it is a measure of the financial success of the organization. Also, according to Muendo, Tschirley, and Weber (2016), client and supplier satisfaction is an important indicator of the organization's ability to meet the needs and expectations of its customers and suppliers, and is therefore an important determinant of long-term success. Therefore, the findings suggest that the organizations represented by the respondents are performing well in terms of market share, sales growth, sales volume, and profitability, but may need to focus more on improving client and supplier satisfaction to achieve sustained success in the long term.

The researcher further collected secondary data to measure performance of the horticulture firms. The data collected was on the volume (kgs) and export earnings (Ksh.) The data was grouped into three main categories of the horticultural sector in Kenya which are; cut flowers, vegetables, and fruits. Findings are presented in Table 4.15.

Table 6: Secondary Data on Firm Performance

Horticultural crops	Export Vol. (Kgs)	Export earnings Kshs. (Billion)
Fruits	405,390,247.4	71,839.2
Vegetables	330,870,341.2	131,686.7
Cut flowers	813,757,856.4	517,913.8
Total	**1,219,279,790.5**	**721,439.7**

The data shows that there is fluctuation on volume of export and value of exports in the five years that were observed. Cut lowers make the largest share of the total horticulture export earnings as they are high-value crops. Earnings from horticulture remains the leading foreign exchange earner in Kenya. Vegetable is the second foreign exchange earner while fruits are the least foreign exchange earner in the horticulture sector in Kenya.

Inferential Analysis

Correlation Analysis

Table 7: Correlation Analysis

		Performance	Supply chain agility
Performance of horticulture exporting firms	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	139	
Supply chain agility	Pearson Correlation	.869**	1
	Sig. (2-tailed)	.023	
	N	139	139

The correlation coefficient between performance and supply chain agility is 0.869 ($p<0.05$), which indicates a very strong positive relationship. This means that firms that exhibit high levels of supply chain agility are more likely to perform well. This finding aligns with previous research by Heim (2017) that has shown that supply chain agility is a critical factor in enhancing the responsiveness of the supply chain to changes in the market environment.

Test for Hypothesis One

The first objective of the study was to assess the effects of supply chain agility on performance of horticulture exporting firms in Kenya. The corresponding hypothesis was:

Ho_1: There is no significant relationship between supply chain agility and performance of horticulture exporting firms in Kenya.

A univariate analysis was therefore conducted to test the null hypothesis.

Table 8: Model Summary for Supply Chain Agility on Performance of Horticulture Exporting Firms

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.554[a]	.307	.298	.087456

a. Predictors: (Constant), Supply Chain Agility

From the model summary findings in Table 8, the r-squared for the relationship between supply chain agility and performance of horticulture exporting firms in Kenya was 0.307; this is an indication that at 95% confidence interval, 30.7% variation in performance of horticulture exporting firms in Kenya can be attributed to changes in supply chain agility. Therefore, supply chain agility can be used to explain 30.7% change in supply chain agility. However, the remaining 69.3% variation in performance of horticulture exporting firms in Kenya suggests that there are other factors other than supply chain agility that explain performance of horticulture exporting firms in Kenya. The findings suggest that supply chain agility, is a significant factor in predicting the performance of horticulture exporting firms in Kenya. This is in line with existing literature which indicates that effective supply chain agility is a key component of supply chains performance (Gunasekaran et al., 2015). These findings suggest that companies operating in the

horticulture export industry in Kenya can improve their performance by improving their supply chain agility.

Table 9: ANOVA for Supply Chain Agility on Performance of Horticulture Exporting Firms

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.159	1	51.159	109.459	.000[b]
	Residual	63.979	137	0.467		
	Total	115.138	138			

a. Dependent Variable: Performance of Horticulture Exporting Firms
b. Predictors: (Constant), Supply Chain Agility

Analysis of variance was used to determine whether the regression model is a good fit for the data. From the analysis of variance (ANOVA) findings in Table 9, the study found out that that Prob>$F_{1,137}$= 0.000 was less than the selected 0.05 level of significance. This suggests that the model as constituted was fit to predict performance of horticulture exporting firms in Kenya. Further, the F-calculated, from the table (109.459) was greater than the F-critical, from f-distribution tables (3.910) supporting the findings that supply chain agility can be used to performance of horticulture exporting firms in Kenya. These findings are consistent with previous research that has found a positive relationship between supply chain agility and firm performance. For example, research by Fawcett et al. (2017) found that firms with more agile supply chains were better able to respond to changes in customer demand and were more successful in meeting customer needs. Similarly, research by Olorunniwo et al. (2017) found that supply chain agility was positively associated with firm performance in the context of the manufacturing industry. The current study's findings provide further support for the idea that supply chain agility is an important factor for firms seeking to improve their performance.

Table 10: Beta Coefficients for Supply Chain Agility on Performance of Horticulture Exporting Firms

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.792	0.188		9.532	.000
	Supply Chain Agility	0.279	0.046	0.319	6.065	.001

a. Dependent Variable: Performance of Horticulture Exporting Firms

From the results in table 10, the following regression model was fitted.

$$Y = 1.792 + 0.297 X_1$$

(X_1 is Supply Chain Agility)

The coefficient results showed that the constant had a coefficient of 1.792 suggesting that if supply chain agility was held constant at zero, performance of horticulture exporting firms in Kenya would be at 1.792 units. In addition, results showed that supply chain agility coefficient was 0.297 indicating that a unit increase in supply chain agility would result in a 0.297 improvement in performance of horticulture exporting firms in Kenya. It was also noted that the P-value for supply chain agility coefficient was 0.001 which is less than the set 0.05 significance level indicating that supply chain agility was significant. Based on these results, the study rejected the null hypothesis that there is no significant relationship between supply chain agility and performance of horticulture exporting firms in Kenya. These findings are consistent Mukhsin and Suryanto (2021) who suggested that supply chain agility is a crucial factor for improving firm performance, especially in dynamic and competitive markets such as the horticulture export industry in Kenya.

Hierarchical Regression Model

Hierarchical regression model was done to test for the moderating effect. This helped to achieve the second research hypothesis and test the fifth research hypothesis.

Ho_2: There is no statistically significant moderating effect of regulatory framework compliance on the relationship between supply chain agility and performance of horticulture exporting firms in Kenya.

Table 11: Model Summary for Moderation Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.642[a]	.412	.403	.65170	.412	150.295	1	117	.000
2	.809[b]	.654	.646	.52727	.242	79.360	3	135	.000

From the model summary findings in Table 11, the first model for which is the regression between supply chain agility (X) without moderator and interaction, the value of R-squared was 0.412 which suggests that 41.2% change in performance of horticulture exporting firms in Kenya can be explained by changes in supply chain agility. The p-value for the first model (0.000) was less than the selected level of significance (0.05) suggesting that the model was significant. This is consistent with previous research that has emphasized the importance of customer-centricity in enhancing supply chain performance (Li, Huang, & Zhang, 2018; Zhang, Huo, & Zhao, 2019).

The findings in the second model which constituted supply chain agility, regulatory framework compliance and interaction term (X*M) as predictors, the r-squared was 0.654. This implies that the introduction of regulatory framework compliance in the second model led a 0.242 increase in r-squared, showing that regulatory framework compliance positively moderates the relationship between supply chain agility and performance of horticulture exporting firms in Kenya. This is supported by prior studies that have shown that compliance with regulations and standards can enhance supply chain performance (Kannan, Diabat, & Alrefaei, 2017; Khan et al., 2019). These findings highlight the importance of implementing supply chain agility and complying with regulations in order to improve the performance of horticulture exporting firms in Kenya.

Table 12: ANOVA for Moderation Effect

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.832	1	63.832	150.295	.000[b]
	Residual	58.225	137	0.425		
	Total	122.057	138			
2	Regression	107.958	3	35.986	129.441	.000[c]
	Residual	37.53	135	0.278		
	Total	145.488	138			

a. Dependent Variable: Performance of horticulture exporting firms

From the model summary findings, the F-calculated for the first model, was 150.295 and for the second model was 129.441. Since the F-calculated for the two models were more than the F-critical, 3.910 (first model) and 2.672 (second model), the two models were good fit for the data and hence they could be used in predicting the moderating effect of regulatory framework compliance on relationship between supply chain agility and performance of horticulture exporting firms in Kenya.

The findings suggest that the models developed in the study are suitable for predicting the moderating effect of regulatory framework compliance on the relationship between supply chain

agility and performance of horticulture exporting firms in Kenya. This is consistent with previous literature that highlights the importance of regulatory compliance in ensuring successful implementation of supply chain practices (e.g., Christopher, 2016; Pagell et al., 2010). Additionally, the finding that the F-calculated values were greater than the F-critical values is consistent with the concept that a good model fit is indicated by a significant F-value (Kline, 2016).

Table 13: Beta Coefficients for Moderation Effect

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.387	.194		7.163	.000
	supply chain agility	.208	.050	.580	4.160	.000
2	(Constant)	1.876	0.409		4.587	.000
	supply chain agility	.220	.067	.782	3.284	.002
	Regulatory framework compliance	.325	.048	.310	6.748	.000
	Interaction (X*M)	.283	.065	1.661	4.357	.000

a. Dependent Variable: Performance of horticulture exporting firms

Further, by substituting the beta values as well as the constant term from the coefficient's findings in Table 13 for the first step regression modelling, the following regression model will be fitted:

$Y = 1.387 + 0.208 X$

Where X is supply chain agility and Y is performance of horticulture exporting firms

The findings show that when supply chain agility is held to a constant zero, performance of horticulture exporting firms in Kenya will be at a constant value of 1.387. The findings also show that supply chain agility has a statistically significant effect on performance of horticulture exporting firms in Kenya as shown by a regression coefficient of 0.208 (p-value= .000).

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

$Y= 1.876 + 0.220 X + 0.325 M + 0.283 X*M$

Where X is supply chain agility; M is Regulatory framework compliance and X*M is the interaction term between supply chain agility and Regulatory framework compliance.

The findings show that when supply chain agility, regulatory framework and the interaction term (X*M) are held to a constant zero, performance of horticulture exporting firms in Kenya will be at a constant value of 1.876. The model also indicated that supply chain agility had a positive and statistically significant effect on performance of horticulture exporting firms as shown by a regression coefficient of 0.220 (p-value= 0.002). It is also seen that regulatory framework compliance had a positive and significant effect on performance of horticulture exporting firms in Kenya as shown by a regression coefficient 0.325. The finding that regulatory framework compliance has a positive influence on the performance of horticulture exporting firms in Kenya is consistent with a study by Rahman and Subramanian (2012) that supply chain regulatory compliance positively affects supply chain performance. Similarly, a study by Zhao et al. (2018) found that regulatory compliance positively affects supply chain collaboration and innovation, which in turn positively affects supply chain performance. These studies suggest that complying with regulatory frameworks can improve supply chain performance by reducing risks and increasing efficiency.

On the other hand, interaction of supply chain agility and regulatory framework compliance (X*M) also had a positive and significant effect on horticulture exporting firms as shown by a regression

coefficient of 0.283 (p-value= 0.000). It is therefore seen that supply chain agility on its own has 20.8% effect on performance of manufacturing firms in Kenya. However, when interacted with customer demand, it has an effect of 28.3%. This is a clear indication that introduction of regulatory framework compliance as moderating variable has positive influence on performance of horticulture exporting firms in Kenya. The study therefore rejects the null hypothesis that there is no statistically significant moderating effect of regulatory framework compliance on the relationship between supply chain agility and performance of horticulture exporting firms in Kenya. This suggests that a combination of supply chain agility and regulatory compliance can lead to improved performance for horticulture exporting firms in Kenya.

Conclusions

The first null hypothesis test was 'There is no significant relationship between supply chain agility and performance of horticulture exporting firms in Kenya'. The study found that supply chain agility is statistically significant in explaining performance of horticulture exporting firms in Kenya. The influence was found to be positive. This means that unit improvement in supply chain agility would lead to an increase in performance of horticulture exporting firms in Kenya. Based on the findings, the study concluded that supply chain agility positively and significantly relates with performance of horticulture exporting firms in Kenya.

The second research hypothesis tested was that 'There is no statistical significant moderating effect of regulatory framework compliance on the relationship between supply chain agility and performance of horticulture exporting firms in Kenya'. The study revealed that regulatory framework compliance is statistically significant in explaining performance of horticulture exporting firms in Kenya. It was also found that the interaction between supply chain agility and regulatory framework compliance had positive, statistically significant effect on performance of horticulture exporting firms in Kenya. Based on the findings, the study concludes that regulatory framework compliance has significant moderating effect on the relationship between supply chain agility and performance of horticulture exporting firms in Kenya.

Recommendations

The study recommends that horticulture exporting firms in Kenya should focus on improving their supply chain agility to enhance their performance. This could include developing contingency plans to manage supply chain disruptions, investing in technology and logistics infrastructure to support real-time data tracking and analysis, and adopting lean management practices to streamline operations and reduce waste. Firms could also consider developing partnerships with suppliers, distributors, and other stakeholders to improve supply chain visibility and collaboration.

The study recommends that horticulture exporting firms in Kenya should prioritize compliance with regulatory frameworks to improve their performance. This could include investing in compliance programs and procedures to ensure that they meet their regulatory obligations, developing partnerships with government agencies and other stakeholders to stay up-to-date on regulatory changes, and adopting a proactive approach to compliance management. Firms could also consider leveraging compliance as a competitive advantage by communicating their commitment to ethical and responsible business practices to customers and stakeholders.

Recommendations for Further Studies

To better understand the unique challenges and opportunities faced by horticulture exporting firms, future studies could compare the performance and supply chain practices of firms in different countries. This could provide insights into best practices and identify areas for improvement.

Technology adoption has become increasingly important in improving supply chain performance. Future studies could explore the impact of technology adoption on the performance of horticulture exporting firms, and identify the specific technologies that are most effective in this industry.

This study found that regulatory framework compliance is important in the success of customer-centric supply chain practices. Future studies could investigate the role of government policies in supply chain management, including how they affect the competitiveness of horticulture exporting firms and the overall performance of the industry.

This study provided a snapshot of the performance and supply chain practices of horticulture exporting firms in Kenya. Future studies could conduct longitudinal research to track changes in performance and supply chain practices over time, and identify factors that contribute to these changes.

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