

**EFFECT OF FOOD VALUE CHAIN GOVERNANCE
DETERMINANTS ON COMPETITIVE ADVANTAGE OF
FRESH FRUITS AND VEGETABLE EXPORTERS IN
KENYA**

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DECLARATION

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

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DEDICATION

To my wife Ann, and our children Esther and Alban

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ABBREVIATIONS AND ACRONYMS

APVC	Agricultural Product Value Chain
BRC	British Retail Consortium
CATPCA	Categorical Principal Component Analysis
CFA	Confirmatory Factor Analysis
CMV	Common Method Variance
COO	Country of Origin
ERS	Economic Recovery Strategy
ETI	Ethical Trading Initiative
EU	European Union
EUREPGAP	Euro Retailer Produce Working Group for Good Agricultural Practice
FAO	Food Agricultural Organisation
FDA	Food and Drug Administration
FFV	Fresh Fruits and Vegetables
FPEAK	Fresh Fruits Exporters Association of Kenya
G&S	Grades and Standards
GAP	Good Agricultural Practice

GCC	Global Commodity Chains
GDP	Gross Domestic Product
GLOBALGAP	Global Good Agricultural Practice
GTIN	Global Trade Item Number
GPS	Global Positioning Systems
GVC	Global Value Chains
HCD	Horticultural Crops Directorate
HCDA	Horticultural Crops Development Authority
HEBI	Horticultural Ethical Business Institute
ISO	International Organization for Standards
KARI	Kenya Agricultural Research Institute
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KENYAGAP	Kenya Good Agricultural Practise
LCI	Level of Chain Integration
MMR	Moderated Multiple Regression
NIE	New Institutional Economics
NT	Network Theory

NoT	Nature of Transaction
OIE	Old Institutional Economics
OLS	Ordinary Least Squares
PAT	Principal Agency Theory
PDO	Product Designation of Origin
PIP	Pesticides Initiative Programme
PPT	Post Productivist Transition
PRS	Public Regulatory Standards
PRSP	Poverty Reduction Strategy Paper
PRT	Property Rights Theory
PSI	Private Standard Initiative
PVS	Private Voluntary Standards
RFID	Radio Frequency IDentification
RBV	Resource Based View
RoK	Republic of Kenya
SCI	Supply Chain Integration
SPS	Sanitary and Phytosanitary Barriers

SRA	Strategy Revitalizing Agriculture
TBT	Technical Barriers to Trade
TCE	Transaction Cost Economics
TPC	Third-Party Certification
TSR	Tripartite Standards Regime
UK	United Kingdom
ULMC	Unmeasured Latent Method Construct
VIF	Variance Inflation Factor

DEFINITION OF TERMS

- Chain Integration:** is the degree to which a focal/lead firm strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organization processes (Flynn, Huo, & Zhao, 2010).
- Competitive Advantage:** is defined as the degree to which a firm reduces its cost, exploits opportunities and neutralizes threats (Newbert, 2008).
- Governance:** is the act, process or power of governing. Governance refers to the inter-firm relationships and institutional mechanisms through which non-market coordination of activities in the chain is achieved (Humphrey & Schmitz, 2001:6).
- Standards and Certifications:** are defined as food safety controls, conventions and accreditation schemes that facilitate governance through compliance to food quality and to promote or sanction product market access (Abbott & Snidal, 2001; Ponte & Cheyns, 2013).
- Traceability:** is the ability to trace and follow a food, feed, food-producing, animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution (EU, 178/2002).

Value Chain Governance: is the pattern in which an industry's organisation is coordinated and mediated between open markets and vertical integration for purpose of value appropriation of both supply and demand driven actors (Altenburg, 2006; Barber, 2008).

ABSTRACT

The main purpose of this study was to discern the overall shift away from vertically integrated chains and arms-length transactions towards value chain governance in food value chains. Specifically this study sought to establish food value chain governance determinants and their relationship to competitive advantage of Kenya's export oriented horticulture in Fresh Fruits and vegetables (FFV). The specific objectives of the study were; to explore the relationship between nature of transactions, nature of contract, level of chain integration and standards and certifications to competitive advantage of fresh fruits and vegetable exporters in Kenya. The research also sought to establish the moderating effect of traceability systems to the food value chain governance determinants. The metrics for measuring the sectors competitive advantage were differentiation based strategies. Descriptive research design was used to formulate contributions and knowledge aspects under global value chains practises in horticultural value chains in Kenya and provide insights to the sector. Structured questionnaires were used to obtain primary data from informants in the sector. Analytical research methods were adopted to analyse secondary data and *ex-post facto* research design was used to report. Quantitative research techniques were used in data presentation by using inferential statistics to draw conclusions. While, the study adopted a census approach only 83 firms responded out of a total of 120 firms in the Fresh Produce Association of Exporters in Kenya (FPEAK) and Horticultural Crops Directorate (HCD) pack-house in Nairobi. Data was analysed using Statistical Package for Social Sciences (SPSS) software version 24. A non-parametric analysis using Categorical Principal Component Analysis (CATPCA) was used for factor reduction, key food value chain governance determinants extracted were namely: nature of transactions, nature of contract, level of chain integration, standards & certifications and external contingencies. The study established that competitiveness in the export oriented horticultural sector was largely influenced by the way transactions were characterized in view to the given export market destination, standards & certifications and the level of supply chain integration as

influenced by information sharing and communication. The findings also demonstrated that while traceability is virtually adopted by all exporters in the value chain, it however remains to be largely paper based. Owing to the short product life cycle of FFV products and complexity of transactions partly attributed to the heterogeneity of export markets, this study validates both hybrid and relational governance backed by information systems promoting chain actors' visibility. While competitiveness has largely been attributed to costs, differentiation and niche markets, Kenyan horticultural export sector reveals net gains to be attributed largely by differentiation strategies related to value addition in post-harvest downstream activities of products and processes linked to improved pack-house activities. The study recommends in policy the primacy of standards & certifications as a key remote governance tool and strategy; increased uptake of electronic traceability to access export niche markets; increased setting up of pack-houses for products value addition and cold-chains for contingency planning of the highly perishable FFV exports.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter presented the background of the study and the conceptual understanding of the variables used, and the sector that the study was positioned. Statement of the problem was elaborated to highlight on the research gap that warranted this study; research objectives, justification, significance, scope and limitation of the study were elaborated.

1.2. Background of the Study

Agriculture is a key focal point and mainstay for development in East Africa among other African countries. Its size and prominence in growth and poverty reduction continues to be heavily relied upon as the backbone due to its contribution to Kenya's Gross Domestic Product (GDP), exports and merchandise trade, national employment, and government revenue. This contribution is corroborated by statistics that agriculture in Kenya directly contributes 26 per cent of GDP and 27 per cent indirectly through linkages with manufacturing, distribution and other service related sectors. The sector accounts for 65 per cent of Kenya's total exports while accounting for 18 per cent and 60 per cent to formal and total employment, respectively (KIPPRA, 2013). This prominence is further elaborated to the non-farm sector, mainly through forward linkages to agro-processing, logistics, marketing and consumption.

The current growth of agriculture has not been consistent compared to the yester years. Between 1963 and 1975 the growth was at the rate of 4.7% largely due to expansion of cultivatable area and increase in yields following the adoption of high yielding crops. Agricultural growth dropped between 1976 and 1980 due to among other factors the 1973-1979 oil crisis that led to fluctuations in international commodity prices of key

agricultural exports like coffee and tea. The growth rate since then has been on a declining trend to the extent that it was about -2.4% in 2000, -1.2% in 2001 and 0.7% in 2002 (Nyoro, Ariga, & Komo, 2004). In 2003, Kenya's agricultural sector grew by 1.5% owing to the momentous drive towards more private sector involvement in the various agricultural activities and the provision of an enabling environment backed-up by policy documents on the Poverty Reduction Strategy Paper (PRSP), the Economic Recovery Strategy for Wealth and Employment Creation (ERS), and the Strategy for Revitalizing Agriculture (SRA).

The export oriented horticultural subsector in Kenya presents a different historical trajectory in its sixth decade of existence compared to a similar period of other agricultural sectors especially of tea and coffee. Jaffee (2003) and Minot and Ngigi, (2004), situates the period in which Kenya's fresh fruits and vegetable trade started as being in the mid-to-late 1950s when small quantities of temperate vegetables were supplied in the European winter to up-market department stores in London. This off-season trade continued to year round supplies of high quality green beans and by broad array of vegetables that comprised part of the traditional diets of the UK immigrant population from South Asia. Green beans and Asian vegetables formed the core of the trade at this time. Kenya was the primary supplier to this specialized market because of its ability to provide the required wide range of vegetables on a year-round basis and established business connections with major supermarkets chains, this was in the late 1980s. By 1988, Kenya was the main supplier of fresh and chilled vegetables to the twelve (12) countries then in the European Union (Dolan, Humphrey and Harris-Pascal, 1999). Recent growth trends in the sector were experienced with the increased value of exports in the late 1990s due to the introduction of several new products- such as runner beans and snap beans- with a growing proportion of products being pre-packed for supermarket sales.

While growth and introduction of new products in the horticultural sector was blossoming; competition resultant to due diligence as instigated by UK's Food Safety Act 1990 as well as market liberalization effect in the same period instigated a rapid shift in horticultural export competitiveness as well as diversification of export product acquisitions to abate over reliance of and preferential treatment of products from isolated countries for certain products; strategic and modernised procurement systems were largely adopted as a standard operating procedure for horticultural export products with preference being on competitiveness on quality, consistency and volumes.

Changes towards the movement of modernised procurement systems for horticultural exports mostly by EU retailers had saliently started to be felt in the mid-1990s with calls for agricultural sustainability, food safety and quality dominating the global trade in fruits and vegetables. Other reasons for in favour of modernised procurement systems included; the expansion and increased number of potential exporters resulting from market liberalization effect in the 1990s (Dolan & Humphrey, 2000; Gibbon, 2001); increased awareness of lifestyle changes through dietary habits. This drastic change was characterised by Barrett, Ilbery, Brown and Binns (1999) as a post productivist transition (PPT); a transition that embraced the whole food chain, from production, processing to consumer choices and marketing systems that have evolved to link them. In essence PPT brought about radical changes in: (1) procurement from spot markets to modernised procurement systems; (2) changes in export production crop production systems with preference to high-input small scale farmers and large scale commercial farming with neglect of low-input small scale farmers (Raikes & Gibbon, 2000) and (3) a shift from lack of emphasis on standards to the use of 'global' private standards.

1.2.1. Value Chain Governance

Value chain concept describes the range of activities which are required to bring a product or service from conception to ultimate consumption and eventual disposal after use; through the supply chain process, intermediary processes of procurement,

production, logistics and customer service are considered. The concept of value chain according to Kaplinsky (2000) was used in the 1960s and 1970s to elaborate the path process of mineral exploitation. Latter works by Michael Porter (Porter, 1985, 1990) promoted a further discourse of this concept with the introduction of value additions aspects at each stage of the supply chain. Hines and Rich (1997); Hines *et al.* (1998) together with Zokaei and Hines (2007) improved the understanding of value chains by introduction of value stream mapping tools that facilitate elimination of wastes in the value chain while striving for maximum satisfaction of customer needs.

Value chain governance concept has been promoted as consequence of the emergent approaches to supply chain management largely based on allocation of resources to core competencies and an increased trend towards outsourcing and sub-contracting of non-core functions; this trend has in part resulted to a general loss of control over the stages of production and distribution process especially to geographically dispersed regions, on the other hand it has resulted in promotion of efficiencies from various specialisations adopted (Smith, 2008). Hence the shift from both vertical integration and open market transactions to value chain governance where non-existent direct ownership control seems a suitable trade-off to cost and control (Altenburg, 2006). The broadening the concept of value chain governance from inter-firm relationships to global fora has also been due to the coincidence of falling regulatory barriers in international trade; advances in communication technologies and declining transportation costs (Vurro, Russo, & Perrini, 2009).

In the developing economies, the discourse on global value chain governance has further been promoted by Gereffi (1994, 2001) in the organization of buyer driven global commodity chains, refinement of this discourse beyond producer driven has concentrated to buyer driven chains with an aim to achieve a customer orientation (Gereffi, Humphrey & Sturgeon, 2005; Zokaei & Hines, 2007); and also internet governance that is currently guiding the 21st Century (Gereffi, 2001). Finally, Gibbon, Bair and Ponte (2008), make a concise and elaborate summary of the major trends on

governance of global value chains from producer driven to governance by coordination and lastly to governance by normalization.

1.2.2. Concept of Traceability

Traceability is a modern concept that allows following a product's route from raw materials to the point of consumption taking into account its complete flow by means of identifying, tracking and tracing procedures and documents. As a concept, traceability was developed in the context of quality system preoccupations at around the 1990s, interests in food traceability have intensified in the last two decades due to the various food crises (Ene, 2013) in different parts of the world.

The first international definition of traceability was given by ISO 8402 standard in 1987 as the ability to retrieve history, use or location of an entity by means of recorded identification. Subsequently, the concept of traceability was introduced in ISO 9000 series of standards on quality assurance systems as key element of any quality management product. Thus, ISO 9000:2005 defines traceability as “the ability to trace the history, application or location of that which is under consideration”. When considering products, traceability relates to the origin of materials and parts, the processing history, distribution and location.

The US Food and Drug Administration (FDA) proposes that traceability identifies “by means of paper or electronic records a food product and its producers, from where and when it came, and to where and when it was sent” (FAO, 2004). In Europe, the European General Law (Regulation No. 178/2002, Article 3: states the “traceability means the ability to trace and follow a food, feed, feed-producing animal or substance intended to be, or expected to be, incorporated into a food or feed, through all stages of production, processing and distribution”. United States view traceability systems to be motivated by economic incentives and not by government regulation (Golan Krisoff, Kucher, Clavin, Nelson & Price, 2004); unlike the U.S., traceability in European Union

is mandatory as per the general food policy established by the European Food Safety Authority (EU 178/2002).

Coff, Barling, Korthals and Nielsen (2008) provide five objectives of food traceability; first, risk management and food safety which involves food health, hygiene and recall systems; second, control and verification this is effected through auditing of producer and retailer activities; third, supply chain management and efficiency this objective aims at coordination of product, information flows and efficiency in cost management, fourth, provenance and quality assurance of products, and finally, information and communication to the consumer.

Kenya as a key exporter to the EU for horticultural products is bound by the general regulations to comply with the implementation of traceability systems. This desire has been borne out of the need for information regarding animal health and food quality and safety requirements (Ene, 2013). Locally, traceability is elaborated in the Kenya's Biosafety (Labelling) Regulation of 2012; this subsidiary legislation emphasizes the need for traceability on matters related to food safety assessment, labelling and packaging of genetically modified materials. The National horticultural draft policy of the Republic of Kenya (2012) also highlights traceability as a pertinent issue in the horticultural sector and also as an important component of trade. It however notes the challenge that there is inadequate implementation of regulatory and administrative measures. The horticultural exporters of Kenya through the umbrella body of FPEAK has adopted the standards of European Retailers Good Agricultural Practise (Eurep-GAP) and through their certification of KENYA-GAP standards is mandated to interpret the concerns of food safety, traceability and good agricultural practice in the local setting while complying to the international standards.

1.2.3 Fresh Produce Exporters Association of Kenya (FPEAK)

FPEAK is Kenya's premier private association which represents growers, exporters and service providers in the horticultural industry. Key membership of FPEAK constitutes Fruits and Vegetables exporters and Flowers exporters. These exporters coordinate a large number of small scale farmers under them for the purpose of realizing the needs of the downstream customers and export markets. FPEAK provides a focal and coordination point for the horticultural export industry by supporting the growers and exporters through technical and marketing information and training; it acts as an information centre and runs active lobbying and advocacy programmes to enhance the sectors competitiveness. FPEAK's goals include: to update and implement Kenya good agricultural practices to recognized international standards; to influence enactment of a facilitative environment for horticulture industry; create awareness in the horticulture industry on market requirements, changes and regulations and to undertake continuous identification of market opportunities (FPEAK, 2014).

As is evident from its role of acting as an information centre and running an active lobbying and advocacy programmes to enhance the sectors competitiveness; FPEAK successfully lobbied for the formation of Kenya Gap and Horticultural Ethical Business Institute (HEBI) in 2007. These bodies have become collective lobbying agencies for public grades and standards and also played a pivotal role in interpreting and upgrading national standards to global standards levels.

The formation of FPEAK as a lobbying agency that successfully lobbied for the formation of a private standards institutions such as, Kenya GAP characterises the Kenyan FFV supply chain as adopting what Tallontire, Opondo, Nelson and Martin (2011) consider as governance mechanisms beyond vertical integration to a horizontal governance approach; a view on how new regulatory institutions involve and affect others formally or informally by way of setting, monitoring, improving or implementing

such standards at the national levels through the inclusion criterion of accountability, transparency and participation (Fuchs, Kalfagianni, & Havinga, 2009).

1.2.4. Competitive Advantage

The concept of competitive advantage remains to be pivotal in strategic management. Porter's (1985) value chain analysis framework is considered a crucial tool for analysing the sources of competitive advantage; competitive advantage being understood as the degree in which a firm reduces its cost, exploits opportunities and neutralizes threats (Newbert, 2008). Value chain analysis comprises disaggregation of the firm or its actors into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation (Bhatnagar & Teo, 2009).

Accordingly, by optimising and coordination of linkages associated with the aligned value chain actors, firms' competitive advantage are gained as a net benefit to the members. Optimisation and coordination of various linkages and chain actors are aligned to specific capabilities that are customer centered; specific capabilities that are specified to members of a given value chain according to the way they are viewed to be either unique or inimitable (Zajac & Olsen, 1993); some of these capabilities that promote inter-organizational competitive advantage are identified by Dyer and Singh (1998, 232) to constitute: (1) relations specific assets; (2) knowledge-sharing routines; (3) complementary resources and capabilities; and (4) effective governance.

Kenya's FFV sector as Dolan and Humphrey (2000) emphasizes has been concentrated on capabilities and strategies of quality, consistency, variety of the products, processing levels, product combinations, packaging, reliability of supply and price; other capabilities that have been cited of the sector include quality, delivery dependability, product innovation and time to market. Other than these capabilities, Kenya's horticultural sector has leveraged on the following value adds; First, Nairobi's location as a centre of air transport to various destinations especially Europe; second, preferential

treatment and agreement under the Lomé Convention between African Caribbean Pacific Countries and the EU for concessionary access for Kenyan Vegetables to EU (Dolan & Humphrey, 2000); Third, sustained demand for horticultural products all year round; Fourth, Kenya's close co-operation with supermarkets and other market sources (Asfaw, Mithöfer, & Waibel, 2010; Schapiro & Wainaina, 1998); Fifth, non-interference by government in the commercial transactions; sixth, economies of clustering which provides support in logistics, market penetration and market identity (Dolan & Humphrey, 2000). Most of the Kenyan exporters have installed processing systems to meet the stringent regulatory requirements such as traceability, invested in post-harvest facilities that meet customers quality expectations, while contributing immensely in post harvesting processes such as product combinations, presentations and packaging, logistics and innovative ways that leverage on the industry's asset specificity of Kenyan location, availability of cheap labour, and the tropical climatic conditions favourable for the year round crop production.

Due to competitiveness of Kenyan horticultural sector, market channels disintegrations-transfer of functions to new actors- have occurred for competitive reasons; for effectiveness reasons the sector has been able to reach targeted groups; and for efficiency reasons the sector has been able to decrease distribution costs from producer to final consumers, and lastly for equity reasons the sector has strengthened her bargaining power of a group of actors (Dijkstra, Meulenber, & van Tilburg, 2001). It is notable however that Kenya has had uncompetitive airfreight rates compared to other African countries such as Egypt and Morocco for bulk produce (Dolan and Humphrey, 2000); the sector has as result of constraints been witnessed to rely more on a differentiation strategy other than cost based advantage.

1.3. Statement of the Problem

Kenya's export oriented horticulture presents a unique historical trajectory of its six decade's existence in trade, sector coordination and governance. From an off-season supplier of temperate vegetables in the European winter in the 1950s to the main supplier of fresh and chilled vegetables by 1988 to the then 12 EU member States through arm's length market relationships. Changes in coordination of the sector's export were felt in the mid-1990s with calls for agricultural sustainability, food safety and quality dominating the global trade in fruits and vegetables. Modernised procurement systems included; the expansion and increased number of potential exporters resulting from market liberalization effect in the 1990s (Dolan & Humphrey, 2000; Gibbon, 2001) and increased awareness of lifestyle changes through dietary habits. This drastic change was characterised by Barrett, Ilbery, Brown and Binns (1999) as a post productivist transition (PPT); a transition that embraced the whole food chain, from production, processing to consumer choices and marketing systems that have evolved to link them. In essence PPT brought about radical changes in: (1) procurement from spot markets to modernised procurement systems; (2) changes in export production crop production systems with preference to high-input small scale farmers and large scale commercial farming with neglect of low-input small scale farmers (Raikes & Gibbon, 2000) and (3) a shift from lack of emphasis on standards to the use of 'global' private standards.

Consequently, this transition consolidated further the retail power, promoted globalisation of supply chains, quality based competition (Lee, Gereffi, & Beauvais, 2012), positioning and remotely controlled means of what is to be produced, how it is to be produced and the logistics involved. While in intent this move by the global lead firms promoted product standardisation, reduced coordination as well as transaction challenges associated with asset specificity, this move ultimately, further weakened vertically integrated firms with a further shift from arms-length transactions give rise to global value chains and value chain governance trends (Altenburg, 2006). While global

value chains are configured around concepts & activities, decisions and implications (Hernández & Pedersen, 2017); increased reliance on value chain governance has gained prominence largely due to its reduced direct forms of ownership in favour of remote governance systems that are favoured as an ownership trade-off between cost and control this was witnessed in the Kenyan horticultural sector through a 4.9 percent decrease in fresh horticultural produce in the year 2011 and 2012, a commensurate decrease of 16.38 percent in value of exports in the same period (KIPPRA, 2013).

This study sought to review the gap on current rationalisation of value chain governance concept, value chain governance determinants as previously proposed in global value chain literature; whereby, value chains and their competitiveness was considered to largely be governed by determinants of complexity of transactions, frequency of transactions, contracts and levels of coordination (Gereffi et al., 2005). This study further prodded the proposition of whether increased use of standards (public or voluntary) and certification schemes would be considered as a critical governance determinant and tool towards competitiveness of Kenya's export oriented horticultural sector.

1.4. Objectives of the Study

1.4.1. General Objective

The general objective of this study was to determine the relationship between food value chain governance determinants and competitive advantage of Kenya's fresh fruits and vegetables' exporters.

1.4.2. Specific Objectives

- i. To explore the relationship between nature of transaction and competitive advantage of fresh fruits and vegetable exporters in Kenya.
- ii. To determine the relationship between nature of contract and competitive advantage of fresh fruits and vegetable exporters in Kenya.
- iii. To assess the relationship between level of chain integration and competitive advantage of fresh fruits and vegetable exporters in Kenya.
- iv. To evaluate the relationship between standards and certifications and competitive advantage of fresh fruits and vegetable exporters in Kenya
- v. To establish the moderating effect of traceability systems on the relationship between food value chain governance determinants and competitive advantage of fresh fruit and vegetable exporters in Kenya

1.5. Research Hypotheses

To examine how each of the independent and moderating variables influenced the response variable, this study sought to test the following null hypothesis:

H₀₁: There is no relationship between nature of transaction and competitive advantage of fresh fruits and vegetable exporters in Kenya.

H₀₂: There is no relationship between nature of contract and competitive advantage of fresh fruits and vegetable exporters in Kenya.

H₀₃: There is no relationship between the level of chain integration and competitive advantage of fresh fruits and vegetable exporters in Kenya.

H₀₄: There is no relationship between standards and certifications and competitive advantage of fresh fruits and vegetable exporters in Kenya.

H05: There is no relationship between the moderating effect of traceability systems on the relationship between food value chain governance determinants and competitive advantage of fresh fruit and vegetable exporters in Kenya.

1.6. Justification of the Study

The thrust of this study stemmed mainly from three areas; namely aspects of traceability, Republic of Kenya's national draft policy of 2012 on horticulture, effect of standards & certifications and supply chain governance. Justification on traceability related to the effect of EU regulation of 178/2002 on general food regulation; article 18 explicitly states that traceability is prerequisite in trading with EU member states (EU, 2002). The regulation's demand for traceability was inculcated on the rationale of establishing food safety and quality assurance to its member states. Gioè (2006, 35) noted that "The two prerequisites necessary to successfully enter the horticultural value chain are consistency in supply and recorded and demonstrated traceability of products".

Further justification to this study is based on the efforts of the National horticultural draft policy of the Republic of Kenya 2012; the policy highlights pertinent issues that offered a relevant feed to this study. The draft policy documented that; first, there was inadequate research that had embraced the value chain approach which had led to low quality products, limited product development and marketing. This study being supply chain management based, sought to address this gap by evaluating agri-food value chains in FFV. Second, the policy dedicated a section on traceability as an important component of export oriented trade. It however noted the challenge that there was inadequate implementation of regulatory and administrative measures. This study thus sought to enrich and add value in situating the moderating effect of traceability systems to the various food supply chain governance determinants.

Thirdly, under the legal and institutional framework, the National Policy recognized the current legal and regulatory frameworks that governed the industry was established by the Kenyan parliament and subsidiary legislations. The horticultural sector is however also being influenced heavily by international standards, protocols, conventions, treaties. Proliferation of latter legislations forms was of concern to this study in the way the legislations had influenced the FFV horticultural sector in so far as food value governance was concerned and in the way the legislations continued to affect the smallholder farmers in meeting the demands enshrined in these food regulations. Fourth, the policy noted that Kenya's exports were largely in semi-processed and low value produce which accounted for 91 percent of total agricultural related exports. The potential in value addition could greatly improve the value of the exports made through differentiating strategy; the current revenue generated could be doubled without a considerable increase in volume of exports.

The discourse on traceability, supply chain integration and value chain governance stem from the discipline of supply chain management, in essence a supply chain management agenda related to information and product exchange at any point of the supply chain processes either as feed-forward or a feedback mechanism. Supply chain management considers the integration of key processes from end user to the original suppliers by provision of products, services, and information that adds value for customers and other stakeholders. This aspect of integration implicitly and/or explicitly alludes also to governance of supply chains. In line with this view the gap on governance of supply/value chains was identified as Gereffi and Lee, (2012) elucidated that:

There are several key Global Value Chain research issues that require a detailed understanding of global supply chain and where Journal of Supply Chain Management readers and their Ph.D. students can make significant contributions. A core issue is mapping the 'governance structures' of global supply chains (Gereffi & Lee, 2012:29).

Gereffi and Lee (2012) together with other GVC scholarship fraternity continues to elaborate that mapping of governance structures involves identifying the input and output structure of the value chain in detail while indicating where the lead firms are located in a given governance structure of an industry.

1.7. Significance of the Study

This study was considered significant mainly in three ways. Firstly, global agri-food systems are facing dynamic changes associated with the growth and expansion of new markets that create opportunities for farmers on one hand and at the same time are associated with immense challenges related to readjustment and upgrading to the new procurement systems, compliance certification, changes in food value chain governance and increased consumer demands for supply chain visibility. This study is focused on investigating the role of traceability systems in moderating food value chain governance determinants and the way traceability can be utilized both as a safety and information tool in managing food crises by providing a unitary and comprehensive measure to food regulation which ultimately lead to competitive advantages and the eventual superior performance (Sigalas & Economou, 2013). In light of this advantage, control of the proliferation of food regulations imposed by the various markets- both by bodies governing public regulatory standards and private voluntary standards- can be achieved.

Secondly, this study served as an incentive to the promising horticultural export industry in Kenya. It specifically set out to document what the industry espoused and enshrined by highlighting the underlying factors to its resilience in the midst of PPT transition, and the emerging changes in governance and the extent to which the transition and post-transition had affected the industry's stakeholders who include the policy makers, the farmers, exporters, regulatory bodies both public and private and the certification bodies that recommended on process improvement on standards certifications and accreditation.

Thirdly, this study sought to apply and empirically test the theories under New Institutional Economics (NIE) framework that focuses on transaction costs and value by analyses of contemporary supply chains in developing countries. Current agri-food systems have non-price factors being considered important in making transactions between buyers and sellers. NIE goes beyond the price mechanism and introduces into the analysis the role that institutions play in influencing coordination and control through supply networks and governance respectively.

Significant beneficiaries to this study will in part be the horticultural industry, policy makers, exporting firms and academia. The study sought to inform the horticultural sector on the benefits of value chain approach in improving product quality and marketing while characterising the FFV value chains; in particular to the policy makers, this study made an assessment of the adoption rate of traceability in the horticultural sector as per the horticultural draft recommendation of 2012 (GoK, 2012). This study thus built on the body of knowledge and literature on value chain governance and the role of traceability systems in mitigating challenges related to information asymmetry and delayed rights of ownership under property right theory.

1.8. Scope of the Study

The scope of this study was delineated by the discipline and paradigm of supply chain management; it therefore employed mainly theories, definitions and processes enshrined in supply chain management framework and related disciplines in management, business and economics. In the larger context, global value chain management framework was utilised to dialogue further on effects of globalised chains with the theories under new institutional economics; specifically, transaction cost economics, principal agency theory, property rights theory, resource based theory and network theory. The study was conducted largely through data collection between November 2015 and January, 2016.

The study was specifically focussed to the horticulture sector in Kenya as specified in the membership population of Fresh Produce Exporters Association of Kenya (FPEAK) as well as the horticultural exporters serviced by the Horticultural Crops Directorate's pack-house (HCD) that are largely export oriented to European Union. While horticulture is considered as a branch of agriculture that defines the science and art of growing fruits, vegetables, flowers or ornamental plants, the scope of this study approached horticulture from the narrow and exclusive perspective of fresh fruits and vegetables (FFVs); it thus excluded floriculture and ornamental plants in order to allow for an in-depth study in homogeneous of food crops meant for human consumption.

1.9. Limitations to the Study

This study was conducted within a limited scope of the sector restricted to FFV products hence the study was considered to be sufficiently representative in testing the variables in question as per the scope. Challenges arising from lengthy and bureaucratic approvals before being granted audience to carry out the survey were many; the reservations expressed by the exporters were partly due to the challenge of impromptu quality audits and inspections by various certification bodies as well as respondents fatigue partly due to the many researchers calling on them to respond to various surveys designed by multiple stakeholders. This study mitigated on this apathy partly by being flexible in appointment timings and largely being available to them during their working hours especially in their pack-houses, this in part increased the researcher's awareness of the sector through observations in addition to the filled-in survey questions.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter presents the theoretical and empirical literature related to value chain governance determinants, traceability systems and competitive advantage. This study made use of various theories in order to study the relationship between food value chain governance determinants on nature of transactions, nature of contracts, level of chain integration and standards and certifications and competitive advantage. Various theories applied were dependent on their effect on the independent variables in the study. New Institutional Economics theory was identified as the unifying theory of this study. The proceeding sections discussed literature review through theoretical review of pertinent theories to the study, extant literature specific to the variables under study as guided by the study's conceptual framework was offered. Lastly a critique developed together with identification of research gaps.

2.2. Theoretical Review

The seminal work by Parsons (1938) "The Role of Theory in Social Research", serves the purpose that any theory provides a basis through which research materials can be coherently organised. In light of Parson's elaboration, although specifically directed to analytical research; theory is abstracted as the 'lens' through which research gaps in an existing knowledge are realised. A theory serves as a guide to direction of fruitful research; while also providing a germane source of cross fertilisation of related disciplines' developments within a field which would otherwise remain theoretically isolated. (Amundson, 1998, 342).

Supply chain management is currently operating in an eclectic manner relying on theories from other well established disciplines such as in the fields of economics, marketing and strategic management. This study therefore set out to examine theories from this background under the New Institutional Economics (NIE) and global value chain frameworks.

New Institutional Economics (NIE) is a multidisciplinary field that includes aspects of economics, history, sociology, political science, business organisation and law (Kherallah & Kirsten, 2002, 110). These authors refer to Oliver Williamson as being accredited to have coined the phrase “New Institutional Economics”. They also acknowledge that the revolution in economics was accredited to Coase’s classical articles in 1937 and 1960, “The nature of the firm” and “The problem of social cost” respectively. This new direction of economics considers that the cost of transacting is determined by institutions and institutional arrangements is the key to economic performance.

The choice of these theories is augmented by Halldorsson, Kotzab, Mikkola, and Skjoett-Larsen (2007, 285) on the emphasis that the first three and the latter two theories answer to the question of how to structure a supply chain and to ascribe what is needed to manage a particular structure respectively. Transaction Cost Economics (TCE), Property Rights Theory (PRT), Principal Agency Theory (PAT) are typically used to identify the best structure of an within institutions (Coase, 1937; Eisenhardt, 1989; Williamson, 1985, 1999). Network Theory (NT) and Resource Based View (RBV) view institutions’ use of resources to stay competitive and the dynamics of inter-organisational relationships.

2.2.1. Transaction Cost Economics (TCE)

Transaction Cost Economics is part of the NIE research tradition. It states that institutions are transaction costs minimising arrangements. Coase (1937) pioneered this theory with the classical work on the 'Nature of a Firm', which argued that, "the main reason why it is profitable to establish a firm would seem to be that is accost of using the price mechanism" (Coase, 1937, 390). The main focus of TCE is the definition of the main structures of coordination of the transactions through the markets or hierarchies. Transaction costs are thus conceived as the costs of carrying out any exchange, whether between firms in a market place or by transfer of resources between stages in the vertically integrated firm. Hobbs, (1996,17) delineates the division of transaction costs into three; information costs that are related to information about products, prices, inputs and buyers and sellers; negotiation costs arise from the physical act of the transaction especially in writing of contracts and finally monitoring costs that arise after an exchange has been negotiated.

Transaction cost economics has two general assumptions; assumptions about human behaviour and environmental characteristics. Assumption about human behaviour relates to opportunism and bounded rationality. Opportunism was defined by Williamson (1979, 234) as "self-interest seeking with guile". This assumption recognises that businesses and individuals will sometimes seek to exploit a situation to suit one own advantage. In as much as opportunism may not be rive and always, the theory however recognises it as often present in some instances.

TCE also views humans as bounded rational individuals who although may always intend to make rational decisions, their capacity to evaluate accurately all possible decisions and alternatives are physically limited. Bounded rationality recognises the limitation of the human mind in the wake of complex situations and future uncertain events; Selten (1990) explains that:

decisions are not strictly to imagination, but they need a decisions emergence view. Decisions emergence view is the conscious deliberation to explain advantages and disadvantages of decision alternatives without necessarily producing clear recommendation. It is therefore the reasoning process that three stages are distinguished, mainly: the superficial stage which is considered to be vague to goal formation and finally to policy formation (Selten, 1990, 654-655).

Assumption about environmental characteristics include: Asset specificity, uncertainty and frequency of transactions. Asset specificity according to Williamson (1985, 55), is defined as “durable investments that are undertaken in support of particular transactions, the opportunity cost of which investment is much lower in best alternative uses or by alternative users should be original transaction be prematurely terminated”. In his handbook of industrial organisation, Williamson (1989, 141-142) elaborates six asset specific types which are related to site specificity, physical asset specificity, human asset specificity, dedicated assets, brand name capital and temporal specificity.

Uncertainty assumption contrasts with perfect information assumption of the Neo-Classical economists’ view. Information about the past, present and the future state is not perfectly known for various reasons. It is necessarily so to infer that without the existence of bounded rationality and opportunism, uncertainty would be much less of a problem since general rules would prevail. However, given these assumptions the uncertainty is considered critical. In such a state, it would be difficult to determine *ex ante* opportunistic behaviour and again confirm about *ex post* bounded rationality, it would be wise and important to consider this aspect in light of contract formulation (Hansen, Hoskisson, & Barney, 2008; Hendrikse & Bijman, 2002). Frequency of transaction assumption implies that if transactions are infrequent, then the cost of alternative governance structures may not be justified. Therefore, the volume, number and or time spread of transaction are important considerations because even with the

previous assumptions if they are infrequent, alternative governance structures may not be necessary.

Application of this theory to this study was related to the variable on nature of transactions as a critical food value chain governance determinant in that it gave the primary drive of why firms exist and what forms of governance are efficient with a given transaction characteristic.

2.2.2. Principal Agency Theory (PAT)

Eisenhardt (1989), offered a comprehensive assessment and review of Principal Agency Theory (PAT) or at times referred to as Agency Theory. In her assessment, PAT is concerned in answering two questions, namely: First, the agency problem which is concerned with establishing the goals of the principal to the agent and the verification of what the agency is doing; and second, the problem of risk sharing especially when the principal and the agent have different attitudes towards risk.

The unit of analysis of PAT is the contract governing the relationship between the principal and the agent, the focus of this theory is to determine the most efficient contract governing a given principal-agent relationship while focussing on the assumptions elaborated by NIE framework that include: uncertainty, bounded rationality, opportunism, information asymmetry. The best way to resolve in such an instance is by provision of complete information whereby the principal knows with certainty what the agent has done or will do, therefore an outcome based contract would be best to suit this scenario.

In the wake of the principal not knowing the outcome of the agent's behaviour, the agency problem presents itself in view of the agent behaving inappropriately, either by having a moral hazard or adverse selection. Eisenhardt (1989, 61) defines these two terms respectively as the "lack of effort on the part of the agent"; and the

“misrepresentation of the agent’s ability”. The solution to moral hazards and adverse selection in the context of simple contract is based on the investment of information systems that would reveal the agents’ behaviour to the principal or by the formulation of outcome type of contracts as outlined in Table 2.1. However, a trade-off in cost occurs to the principal in the form of the cost of measuring behaviour and the cost of measuring outcomes and transferring the risk to the agent. With this theory, this study sought to assess the effect of nature of contract and their formulation and how they would affect the general governance of contracted parties in the horticultural value chains as well as to assess the propositions undertaken to ensure that optimal nature of contracts are achieved in terms of the desired outcomes of a given transaction such as in contract farming, production contracts or leases.

Table 2.1: Comparison of the Agency Theory Assumptions and the corresponding Optimal Contracts

Agency Theory Assumptions	Proposed Optimal Nature of Contract
Self-interest of the Agent	Outcome Based
Risk Aversion	Behavioural Based
Goal Conflict	Outcome Based
Bounded Rationality	Behavioural Based
Information Asymmetry	Outcome Based
Pre-eminence of efficiency/Programmability	Behavioural Based

(Eisenhardt, 1989, 63)

2.2.3. Property Rights Theory (PRT)

Property Rights Theory (PRT) has its beginning in the early classical works of Coase, (1937, 1960) and Alchian and Demsetz (1973). These classical works were followed by the seminal works by Grossman and Hart, (1986) and Hart and Moore, (1999); the latter economists ushered in the modern view of property rights theory that is also referred to as GHM model taking after their names. Property Right Theory focuses on improvement in social welfare (Coase, 1960) while transaction theory focuses on reduction of costs. PRT complements organisational economics approach that informs analysis of both institutions and governance within interrelated disciplines such as strategic management and economics.

Due to the assumptions proposed by TCE in relation to uncertainty and opportunism, the willingness of suppliers of commodities or services anticipate the need for safe-guards where discussions on contracts and incentives arise; with the assumptions of uncertainty and opportunism also it is discerned that a solution of either agency or property rights theory can be considered to be a feasible solution (Williamson, 1985). Property rights are therefore referred to be the rights to use, to own income from, and to transfer or exchange the assets and resources. Property rights discourse spurns off varying understanding especially in so far as claim to portions of rights of the same resource are concerned. In view of this, the concerned parties are said to lay claim to portions of rights in what Alchian and Demsetz (1973) refer to as ‘bundles of property rights’.

The claim of property rights theory stems from the argument of incomplete contracts as highlighted in PAT theory. NIE posits that contracts are consequentially incomplete in view of imperfect information, bounded rationality and the transaction cost involved in negotiating and monitoring of contract as otherwise cited as the *ex-ante* and *ex post* costs respectively. Hart and Moore (1999, 134) elucidate the subject matter under incomplete contracts by the defining them as “contracts that either parties would wish to add contingent clauses, but are prevented from doing so by the fact that the state of nature

cannot be verified (or because states are too expensive to describe *ex ante*)”. As a result, principal agency theory is mediated by property rights theory with the introduction of common asset ownership either through joint ventures or alliances. Kim and Mahoney, (2005, 227) give emphasis on this view as they affirm that; “The modern property rights theory complements extant agency theory and transaction costs theory by introducing ownership concepts in an incomplete contract setting and emphasising relation-specific assets (both physical and human asset specificity)”.

Some of the ownership aspects in an incomplete contract are arrived at due to the limitation of measuring costs especially *ex post* monitoring costs “...the quality of a product may be known before purchase (search good), after purchase (experience good) or only with difficulty even after consumption (Credence good)” (Martino & Perugini, 2006, 435). Many process quality attributes are credence attributes for buyers in the absence of monitoring information asymmetry arising from experience; this increases transaction costs for downstream food firms. Barzel's (1982, 32) discourse elaborated this emergent issue with his view that;

As a rule, measurement is by the seller, whether in advance or at the time of exchange. Quite often, however, measurement is automatic, or its costs is greatly reduced as the commodity is used. Therefore, substantial savings will result if measuring is left to the buyer to be performed at the time of consumption (Barzel, 1982, 32).

This arrangement of vesting to the consumer the responsibility for certainty measurement is made tenable by the modern day arrangements espoused in guarantees, warranties, share contracts, value of brand names and labels; as such the theory of PRT was best optimised and applied in the governance determinant of types of standards and certifications in place, this was also applied in the moderator variable of traceability systems that offered the confidence and guarantee of an assured measure of value by the consumer hence minimises the *ex-ante*, opportunism, and uncertainty costs. Traceability

systems is in this study were viewed from this perspective of justifying the property right from Barzel's (1982) theory of delayed rights or guarantee that the upstream agents/suppliers in the chain will be charged in the likelihood of failure to comply to safety and standards once the ascertainment of value is made by the ultimate consumer.

This view of delayed rights is currently also applied in the emergent discourse associated to the stakeholder theory in strategic management; where ownership is redefined using the concepts of property rights theory. According to Mahoney (2012), while classical theorists defined ownership as the residual rights to income; modern property rights theorists define ownership as the residual control rights. “Effective management of residual rights to income effectively mitigates the *ex-ante* contractual problems while appropriate allocation of residual control rights mitigates *ex post* contractual problems” (Mahoney, 2012, 154); modern day global value chains are controlling production, products, processes and logistics from dispersed regions of the globe and with the ascertainment of quality standards and product, process standardization residual rights of control are easily achieved thus further promoting remote forms of governance structures.

2.2.4. Network Theory (NT)

Individual firms depend on resources controlled by other firms. Jraisat (2011) noted that network relations create information sharing by enabling buyers and sellers to have access to resources and knowledge beyond their abilities through long term relationships. Network theory includes three interrelated components of activities, actions and resources. Skjoett-Larsen (1999) elaborates that actors are defined by the resources they control and the incentives they perform. This author further distinguishes the relations between a firms in a network arrangement through two separate types of interactions namely; exchange processes and adaptation processes. “Exchange processes include exchange of information, goods and services, social processes... Adaptation processes include mutual modifications of products, administrative systems and

production processes in order to achieve a more efficient exploitation of resources” (Skjoett-Larsen, 1999, 43).

Adaptation processes are important in that: First, they help to strengthen the bonds between partners and, second, they signal a mutual relations that can improved to increase stability. Network theory therefore enhances definition of supply chain management as the integration of key processes from end user through original suppliers that provides products, services and information that adds value for customers and other stakeholders (Rogers, Lambert, Croxton & García-Dastugue, 2002).

The emphasis from network theory was assessed by the level of integration of actors, activities and resources with the aim of promoting synergies of cost minimisation and control amongst the integrated actors. Jone, Hesterly and Borgatti (1997) note that network governance resonates around two concepts: (1) patterns of interaction in transactions/exchange and relationships and (2) flows of resources between the actors involved. To these authors, network governance is therefore described as a select, persistent, and structured set of autonomous firms or actors engaged in creation or provision of products and services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges/transactions. These contracts are considered to be socially binding rather than legally binding; therefore network form of governance is relied more on social coordination and control as in the case of socialization, collective sanctions and reputations as opposed to authority or legal redress mechanisms. Resultant to the adoption of network theory under network governance; Jone et al. (1997) identify four conditions emergent to network governance to revolve in (1) demand uncertainty with stable supply, (2) customised exchanges high in human asset specificity, (3) complex tasks under time and pressure, and (4) frequent exchanges among parties in the network (p. 918); in reality this are the very circumstances experienced in the export oriented horticultural sector.

2.2.5. Resource Based View (RBV)

Previous research in organisation economics goes back to Coase's (1937) work 'On the nature of a firm'. Madhok (2002) in reviewing Coase's works posed the questions that are most often posed by entrepreneurs and business partners occasionally and unconsciously without asking themselves. These questions include: Why is an activity organised within firms and not purchased from the market? Why is an activity organised within a particular firm and not another? These are some of the questions that the Resource Based View (RBV) theory strives to answer. To some, the firm has been viewed from the cost aspect such as in the TCE theory; yet to others, the view of the firm has been related to incentives and safeguards which has yielded theories related to PAT and PRT. The resurgence of interest in the firm has been reviewed from the role of the firm's resources as the foundations of firm's strategy. The theory on RBV is hinged upon the foci of resources and capabilities of the firm (Skjoett-Larsen, 1999).

Grant (1991) offered a practical framework through which resource based approach to strategy analysis is done. The process entailed identification and classification of the firm's resources and capabilities, appraisal of the potential of the resources and capabilities' competitive advantage, selection of a strategy which best optimises on these resources and capabilities to external opportunities and finally, identification of resource gaps that need to be filled. Grant (1991) definitions for resources from an operation's and production management perspective considered resources as the basic units of an input into the production process; while capability was viewed to be the capacity of a resource to perform some task or activity. Skjoett-Larsen (1999, 45) described resources to be "the stocks of available factors that are owned or controlled by the firm while capabilities refer to as firm's capacity to deploy resources to effect a desired end".

Prajogo, McDermott and Goh (2008) further help to position the application of RBV in this study in the context of competitive advantages though the defined purpose of resources and capabilities in offering competence to firms. According to them, capability

is the ability for a set of resources to perform a certain task of activity while competence is defined as a bundle of skills, aptitudes or technologies that enable a firm to deliver a particular benefit to customers. Resources and capabilities in the RBV theory results to competitive advantage that is boosted by the characteristics of resources and capabilities that are value adding, rare, costly to imitate and with limited transferability (Skjoett-Larsen, 1999). These were related to in this study as the strategic resources or the core competencies to the specific firm. Non transferability of resources according to Grant (1991) resonated well to the spatial advantage of Kenya's horticultural sector positioning in the tropic and her favourable climate to produce horticultural commodities through farming all year round.

The summary of the five theories presented in Table 2.2 analysed the theories through the characteristics of their unit of analysis, their theoretical assumptions, primary drive, nature of relations and their application to this study on their unique characteristics related to value chain governance determinants competitive advantage and traceability systems. The choice of these theories under the NIE framework and specific to this study was in relation to the following considerations. First, the theories have from previous research gained prominence in application of supply chain management discourse. Defee, Williams, Randall and Thomas, 2010, 405, 411) audited theories applied in logistics and supply chain management research and found out that SCM research "is at the intersection of multiple disciplines including strategic management, purchasing, manufacturing, marketing, retail and logistics".

Table 2.2: Comparison of Transaction Cost Economics (TCE), Principal-Agency Theory (PAT), Property Rights Theory (PRT), Network Theory (NT) and Resource Based View (RBV).

Characteristics	TCE	PAT	PRT	NT	RBV
1 Unit of Analysis	Transactions	Principal-Agent Contract	Institution	Relations	Resources & Capabilities
2 Sources of Market Frictions/ Assumptions	Bounded Rationality, Uncertainty, Information Asymmetry, Opportunism & Asset Specificity	Information Asymmetry, Incomplete contracts	Information & Asset Asymmetry, Externalities, Unclearly defined and difficult to enforce rights, weak appropriability. Incomplete contracts, <i>Ex Ante</i> Property rights allocation & <i>Ex Post</i> distribution conflicts	Bounded Rationality, Trust	Bounded Rationality, Trust, Asset Specificity
3 Problem Orientation/ Primary Driver	Efficient Governance structures: Why do firms exist	Contract design: What is the most efficient contract?		Dyadic Relationships embedded in networks	Internal Competence Development: Why do firms differ?
4 Nature of Relations	Market Failures	Efficient Division of labour	Ownership and control	Access to Heterogenous resources	Access to complementary resources
5 Supply Chain Application Strategies	Make or Buy Decisions, Market and Hierarchies	Contracts and incentives	Joint Ventures and Alliances	Actors Integration	Competitive Advantage, Out-sourcing, Competencies
6 Characteristics related to Traceability	Information Asymmetry, Uncertainty, Opportunism	Information Asymmetry, Uncertainty, Opportunism	Information Asymmetry, Uncertainty, Opportunism	Asset Specificity	Asset Specificity
7 Variable Alignment to Theory	Value Chain Governance determinants: Nature of Transaction & Supply Chain Integration; Traceability, Information Asymmetry.	Value Chain Governance determinants: Nature of Transaction & Supply Chain Integration; Traceability,.	Value Chain Governance determinants: Nature of Transaction & Supply Chain Integration; Traceability, Information Asymmetry.	Value Chain Governance: Supply Chain Integration; Traceability.	Competitive Advantage, Traceability & Quality Assurance.

Adopted from: Skjoett-larsen (1999, 46), Madhok (2002, 540), Kim and Mahoney (2005, 231) & Halldorsson *et al* (2007, 289)

To a large extent, SCM research is derived from these generic theoretical paradigms. Specifically, the five theories above fall under the first three clusters of theories namely: competitive (RBV), microeconomic (TCE, PAT & PRT) and systems (NT) which form 52.8 percent of the theories analysed. TCE and RBV formed respectively, the largest number of theoretical incidences of 10.4 and 8.6 percent (Defee *et al.*, 2010: 407).

Second, the theories they inform this study on how to structure a supply chain to ascribe what is required in each structure. Halldorsson *et al.* (2007) emphasizes that the first three (TCE, PAT & PRT) and the latter two (NT and RBV) theories answer to the question of how to structure a supply chain when viewed as a collaborative institutions and to ascribe what is needed to manage a particular structure respectively. Thirdly, all the five theories are based on the larger New Institutional Economics framework that seeks to surmount the limitations of both the Neo-Classical Economics and Old Institutional Economics and refine on them; Fourth and final, the (TCE, PAT & PRT) theories elaborate on characteristics of information asymmetry, uncertainty, opportunism as related to traceability and asset specificity is related to NT and RBV theories under governance relations.

2.3. Conceptual Framework

A conceptual framework is concise description of phenomena under study; it is visually depicted in relation to the variables under study. A conceptual framework is a basic structure that consists of certain abstract concepts that are represent the observational, experimental and synthetically aspects of a process or systems being conceived (Bogdan & Biklen, 2007); refer to conceptual framework as illustrated in Figure 2.1.

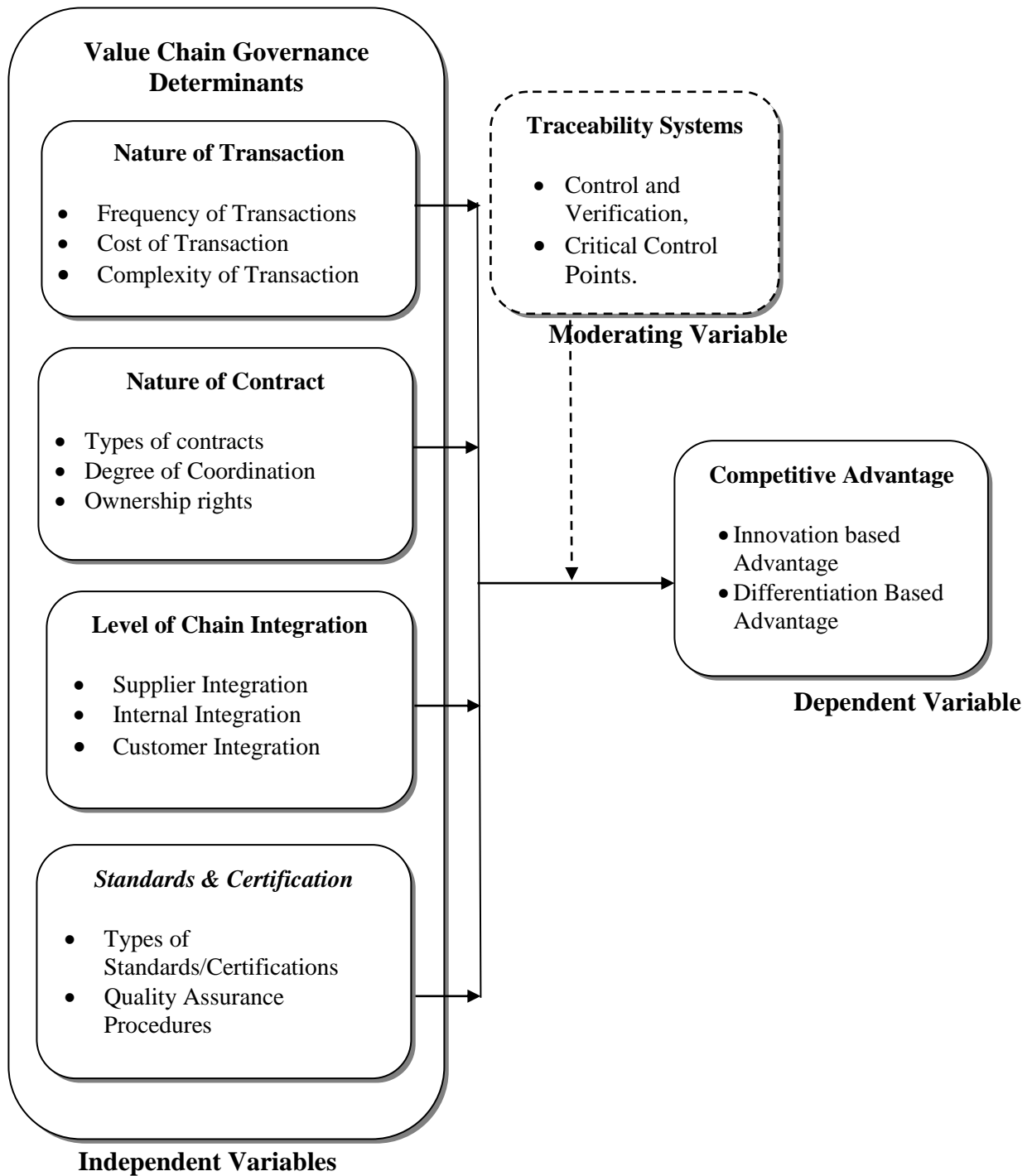


Figure 2.1: Conceptual Framework

Independent variable is that which is presumed to affect a dependent variable and can be changed as required. The dependent variable is on the other hand responds to independent variable(s); it is what is measured in an experiment. The dependent variable in this study is competitive advantage while the independent variable is the value chain governance determinants. A moderating variable of traceability systems is also presented.

2.3.1. Value Chain Governance Determinants

Value chain governance concept has been promoted as consequence of the emergent new approaches to supply chain management largely based on allocation of resources to core competencies and an increased trend towards outsourcing and sub-contracting of non-core functions. This trend has resulted to a general loss of control over the stages of production and distribution process especially to geographically dispersed regions; the trend has also diminished vertically integrated and arms-length transactions (Barber, 2008). Vurro, Russo and Perrini (2009), led to broadening the concept of value chain governance from inter-firm relationships to global *fora* due to the coincidence of falling regulatory barriers to international trade, advances in communication technologies and declining transportation costs. The rise of global value chains are found largely in industries that a largely labour intensive.

Exposition on governance structures and their different typologies was scaled up by Gereffi's seminal work (1994, 2001) following from Williamson's research on governance as viewed from extremities of market or hierarchies. Gereffi (1994, 2001) highlighted the typologies of buyer driven versus producer driven forms of governance. Producer driven commodity chains being found in capital intensive sections that require a huge capital outlay; while buyer driven governance, relating to retailers or markets providing the leading role in managing the supply chains. The role of the lead firm is therefore a key factor in coordination of activities, goods/services and information along the chain (Gibbon *et al.*, 2008; Ponte & Gibbon, 2005). In this study, Fresh Fruits and vegetable exporters are considered to be lead firms.

Gereffi *et al.* (2005) elaborate that due to the wide range of inter-firms governance types in the global arena, there is the realisation of complexity of inter-firms relationships in the global economy. To them, “the key insight is that coordination and control of global scale production systems, despite their complexity, can be achieved without direct ownership” (Gereffi *et al.*, 2005: 81). The view of governance as coordination, emphasizes global value chains compared to the view of governance as driver that is based on the understanding of global commodity chains. This nuance points to the value dimension of the coordination. Gereffi *et al.* (2005) added to Williamson’s categories three distinct types: modular, relational and captive. Consequently, their typology identified five basic types of value chain governance. This typology is based on three factors: (i) the complexity of information and knowledge transfer; (ii) codification of information and knowledge transmitted to actors in a transaction, and (iii) the capabilities of actual and potential suppliers in relation to the requirements of the transactions (Gereffi, *et al.*, 2005, 85).

The typologies by Gereffi *et al.* (2005) include governance by market relations, Modular value chains, relational value chains, captive value chains and hierarchical value chains. Significant to these types of governance structures are the characteristics or determinants related to complexity of transactions, ability to codify transactions, capability of the supply base and degree of coordination and power asymmetry (Gereffi, Humphrey & Sturgeon, 2005; Gibbon, Bair & Ponte, 2008). This study operationalized four global value chain determinants namely, nature of transactions, degree or level of chain integration, nature of contract and standards and certifications; these determinants are adopted from Gereffi’s *et al.* (2005) three determinants of complexity of transactions and ability to codify transactions as a sub-variables of nature of transaction; while capability in the supply-base was treated as a sub-variables under the degree or level of chain integration. This study as well adopted nature of contract as an independent and an explicit coordination mechanism that is particular to Kenya’s development model in export oriented agriculture through participation of smallholder farmers (Ochieng, 2007); lastly this study operationalised standards and certification schemes based on

Ponte and Gibbon's (2005) quality related standards mechanisms and their implicit role in governance of global value chains. Table 2.3 summarises these relationship of the various governance types and their determinants as appraised by Gereffi et al. (2005).

Table 2.3: Key Determinants of Global Value Chain Governance

Governance type	Complexity of Transaction	Ability to Codify transactions	Capability in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	↕
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

Source: Gereffi *et al*, (2005, 87.)

Global food supply chain systems seem to combine the five aforementioned determinants of governance. Martino and Perugini (2006), contextualise the need for a proper governance of food supply chain in relation to food quality and safety; to them, the subject of food safety is situated in relation to the provisions of the TCE theory and its relevance to, food safety, quality, information asymmetry, uncertainty, opportunism and governance structures.

Martino and Perugini (2006) further characterised food safety by the following features: (i) a typical asymmetric information regarding the upstream and downstream supply chain actors, (ii) poor quality is punished by the market while lack of safety may involve legal sanctions, (iii) attainment of safety standards entails a huge investment of various

resources; (iv) these unique features, entail the need for coordination along the food supply chain (Martino & Perugini, 2006, 435). The sub variables adopted to elaborate on food value chain governance determinants include: nature of transaction, nature of contract, standards and certifications and supply chain integration; against these sub-variables on value chain governance determinants was their assessment of their effect to the dependent variable on competitive advantage. The general null hypothesis for this study was thus formulated as below:

H₀: There is no relationship between food value chain governance determinants and competitive advantage of fresh fruits and vegetable exporters in Kenya

This independent variable is linked to five theories under this study namely, transaction cost economics, principle agent theory property rights theory, resource based view theory and network theory. These theories related to value chain governance in the orientation of assessing efficient governance structures; contract design and appraisal of efficient contract & ownership and control respectively. The sub-variables to value chain governance determinant are specified in the subsequent section.

2.3.1.1. Nature of Transaction

Nature of a transaction is largely characterised by frequency, complexity and cost of the said transaction and ability to codify the transaction (Gereffi, Humphrey & Sturgeon, 2005). Different forms of governance arise from frequency of transactions. The frequency of transaction is related to the number of repetitions of a transaction in a given period of time. Changes in transaction characteristics should determine the variation of transaction costs, such as information, negotiation, and monitoring costs (Banterle & Stranieri, 2013). Higher frequency of transactions brings familiarity to contractual parties at the interfaces in which human actors in charge of operations interact with one another more often, and hence building personal trust in relationships. As the level of trust increases, personal integrity may suppress opportunism and then reduce the degree of uncertainty. Agri-food supply chains continually improve due to stronger supply

chain capabilities associated with increased coordination, information exchange, and responsiveness of the organizations involved, however, in globalised supply chains, the need for formal contracts cannot be downplayed especially due the rise of uncertainties, complexity of transactions, cost of transaction and inability to codify transactions. Therefore the following hypothesis was tested.

H₀₁: There is no relationship between nature of transaction and competitive advantage of fresh fruits and vegetable exporters in Kenya.

This sub variable is linked respectively to the theories of TCE, PAT and PRT in so far as decisions related to transaction decisions such as make or buy; nature of contract and the specific form of governance structures to be adopted are priory defined by the nature of transactions to be conducted by the supply chain actors.

2.3.1.2. Nature of Contract

Nature of contracts generally spells out the binding terms of engagement. Contracts, as a governance mechanism, is designed to attain two main objectives: first, delineate authority responsibility structure; and two, share risk among chain partners (Ghosh & Fedorowicz, 2008). According to Ji, Felipe, Briz, and Trienekens (2012) uncertainty alludes to unanticipated changes in circumstances around a transaction. Uncertainty is expressed in two forms that is behaviour and environmental uncertainty. Due to uncertainty, formulation of contracts *ex ante* and the ability to verify compliance *ex post* has largely led to emergence of incomplete contracts. Part of the challenge related to incomplete contracts as Cannon, Achrol, and Gundlach (2000) argue is that when a transaction involves relationship-specific adaptations and is (1) subject to dynamic forces and future contingencies that cannot be foreseen or (2) involves ambiguous circumstances where tasks are ill-defined and prone to exploitation, the difficulty of writing, monitoring, and enforcing contracts is increased and their overall governance effectiveness weakened. In each case, efforts to govern the relationship on the basis of

detailed and formal contracts- without the benefit of some additional clauses-are not likely to enhance performance.

Nature of contract is also construed to be related to aspects of rights and obligations of the contracting parties. Some forms that the nature of contract take include marketing contracts, production contracts and contract farming. As such, marketing contract represents an agreement by a buyer to provide a market for the seller's output. In this arrangement, the seller transfers some risks and decision over when and how the product is to be sold to the buyer. Production contracts exists where the buyer supplies and manages all the inputs on the farm and the farmer usually becomes simply a supplier of the land and labour. Next in the supply chain continuum, there is contract farming which refers to the system of production and supply of products by farmers to the buyers under forward contracts (Gyau & Spiller, 2008). Specifically Kenya's agricultural development model contract farming has been endeared by smallholder farmers as a means to participate in export oriented agriculture (Ochieng, 2007).

Despite this limitation of human in nature of unforeseen events, parties continue to contract to safeguard their interests as related to ownership rights. Ownership rights are in the economic sense construed as property rights; these rights offer the most effective mechanism for providing economic agents with appropriate incentives to create, maintain, and improve assets (Chaddad & Iliopoulos, 2013; Chaddad & Cook, 2004).Ownership rights to these authors relate to two distinct concepts: residual returns (or claims) and residual rights of control. "Residual rights of control are defined as the rights to make any decision regarding the use of an asset that is not explicitly attenuated by law or assigned to other parties by contract"(Chaddad & Cook, 2004, 349); While residual claims are defined by these authors as "the rights to the net income generated by the firm-i.e., the amount left over after all promised payments to fixed claim holders (e.g., employees, debtors)" (Chaddad & Cook, 2004, 349) . Residual rights of control emerge from the impossibility of crafting, implementing, and enforcing complete contracts. Because all contracts are unavoidably incomplete, it is the residual right of

control over an asset that defines who is the “owner” of that asset (Grossman & Hart, 1986).

The analysis of the formal allocation of ownership rights accordingly identifies three generic governance models as related to the extent to which members engage in decision management and decision control functions (Chaddad & Iliopoulos, 2013); these models include integration model, separation model, and delegation model and respectively they represent from the highest to the least the degree of decision making and decision control. This study therefore focuses on the independent variable of nature of contract under which types of contracts, degree of coordination and ownership rights will be considered; the following hypothesis was thus tested.

H₀₂: There is no relationship between nature of contract and competitive advantage of fresh fruits and vegetable exporters in Kenya.

2.3.1.3. Level of Chain Integration

Integration is the quality of collaboration that exists among clusters actors to achieve an effective, efficient and united system (Maleki & Cruz-machado, 2013). Level of chain integration (LCI) is the degree to which a focal/lead firm strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organization processes (Flynn et al., 2010). The eventual goal of supply chain integration is to achieve effective and efficient flows of products and services, information, money and decisions, to provide maximum value to the end customer.

The seminal work by Frohlich and Westbrook, (2001) spelt out LCI through forward integration that promoted the flow of materials and services while backward integration promoted sharing of information from customers up to the suppliers. Supply chain integration indicators have been discussed by various scholars to consist of internal integration and external integration (Maleki & Cruz-machado, 2013; Tomas, Rosales, Batalha, & Alcantara, 2014) others included product integration and process integration

(Huo, Qi, Wang, & Zhao, 2014) yet other scholars operationalised LCI within external integration alluding to both supplier and customer integration (Tomas *et al.*, 2014). This study focused on the level of chain integration from the view of internal integration-to include both product and process integration,- supplier integration and customer integration (Boon-itt & Wong, 2011).

Level of supply chain integration is assessed internally within and across functions and externally across suppliers and customers (Boon-itt & Wong, 2011). Internal integration is characterized by full systems visibility across functions such as procurement, production, logistics, marketing, sales, and distribution. It is the key driver of competitive advantage in supply chain management (Van Hoek & Mitchell, 2006). The goal of internal integration is to develop a process-oriented focus; a focus on coordination across functional areas (Richey, Roath, Whipple, & Fawcett, 2010). Supplier integration involves the effective alignment, information sharing, and participation in the interactions between firms and their suppliers.

Supplier integration requires cooperative, coordination and collaboration (Moharana, Murty, Senapati, & Khuntia, 2012) by including joint efforts in product development, problem solving, technology exchange among others. On the demand side of a supply chain, through customer integration, firms will discern deeply into the customer organization to understand its product, culture, market and organization in such a way that they can respond rapidly to the customer's needs and requirements. Both Supplier and customer integration focus on coordination and collaboration efforts that occur among supply chain members. Agri-food supply chains continually improve due to stronger supply chain capabilities associated with increased coordination, information exchange, and responsiveness of the organizations involved. The degree of coordination is largely affected by factors related to changing consumer preferences, increased need for information management, advancement in biotechnology and environmental concerns; due to these factors there is increased movement from spot market type of governance to more closely coordinated forms of governance focusing on relational or

vertically coordinated forms of governance. Therefore the level of coordination can be related to a particular form of governance where the levels of risks and returns associated.

SCI promotes performance and redefines governance values in the way organizations interact and relate. Governance change is also related to changing the organizations' ways of doing things by way of inclusive communication, strong working relationships, joint accountability, and senior management involvement; these ways facilitate internal integration while interdependency, common goals and objectives, communication, and information sharing are some of the factors considered to be key to the effective governance of firm relationships with others (Richey et al., 2010). The degree of coordination is largely affected by factors related to changing consumer preferences, increased need for information management, advancement in biotechnology and environmental concerns; due to these factors there is increased movement from spot market type of governance to more closely coordinated forms of governance focusing on relational or vertically coordinated forms of governance. Therefore the level of coordination can be related to a particular form of governance in line to the level of risks and returns associated. As a result, supply chain integration aims at promoting interdependency, structures or formative relationships which are communicative through exchange of information, collaborative alignment, profitability and competitive advantage (Engelseth, 2009). This independent variable on supply chain integration therefore generated the following hypothesis that was tested.

H₀₃: There is no relationship between the level of chain integration and competitive advantage of fresh fruits and vegetable exporters in Kenya.

2.3.1.4. Standards and Certifications

Discourse on standards and certifications have largely been fronted as either a remote governance instrument or a differentiation determinant in speciality marketing. With this governance view, Abbott and Snidal (2001) first point out that standards and

certification schemes are applied to deal with externalities and are sub-categories of governance, to these authors, “externality occurs whenever one actor’s conduct affects the well-being of another”(347). Secondly, adoption of standards have given rise to remote forms of governance by way of defining and managing value chain specific activities, setting conditions of participation in value chains, determining functional division of labour and barriers to entry along the chain (Nadvi, 2008; Ponte & Gibbon, 2005).

Lastly, as proposed by Ponte and Gibbon (2005), standards have become conventions to regularise by way of promoting or sanctioning functions, actors and their activities have thus impacted on the management and administrative mechanisms of value chains and their structures as well as availed upgrading opportunities for producers or appealed means for sustainability (Ponte & Cheyins, 2013). The rise of food standards in export value chains, rising demand for consistent high volumes and good quality produce has led to more vertically integrated value chains (von Hagen & Alvarez, 2011); this view is corroborated by both Vlachos' (2014) four categorisation of supply chain governance typologies namely spot markets, standards, contracts and vertical integration.

The differentiation view of standards and certifications has largely been witnessed through adopting standards as an competitive incentivising tool to fresh produce importers (García Martínez & Poole, 2004; Garcia Martinez, Poole, Skinner, Illés, & Lehota, 2006); Reardon, Codron, Busch, Bingen, and Harris (1999) augment these views by the assertion that: “the role of grades and standards (G&S) has shifted from a technical instrument to reduce transactions costs in homogenous commodity markets to a strategic instrument of competition in differentiated markets. The nature of G&S has shifted from performance... to process standards” (p. 421); three responses to grades and standards have been applied by various agencies, namely: (i) by large private certification, labelling and branding systems; (ii) by medium-large domestic firms, to lobby governments to adopt public G&S similar to those in export markets in developed

regions; (iii) by small firms to ally with public and non-profit sectors to form G&S and certification systems to all export markets.

Other than the two general frontiers that the discourse on standards has taken, standards and certifications have been differentiated into two strands in the horticultural export sector namely; public standards formed by regulations imposed on imports; such regulations fall under the World Trade Organization rules. These regulations are subject to the Agreements on Sanitary and Phyto-Sanitary barriers (SPS) and Technical Barriers to Trade (TBT). The second set of standards are composed by standards emerging from retailers' action and are required by several large multinational retailers, some wholesalers and food service companies such as GlobalGAP, formerly EureGAP; these type of standards are described as voluntary or private standards; the depth into this duality of public and private standards has been exhaustively been done in Busch's works (Busch, 2009, 2010, 2011, 2014; Busch et al., 2005).

With the entry of European supermarkets in the Fresh Fruits and Vegetable (FFV) supply chain saw the proliferation of standards and stringent conditions being required of the upstream agents and exporters for reasons related to due diligence as instigated by UK's Food Safety Act 1990 thereafter the emergence of EureGAP; spawning from the public regulations a myriad of standards and certification schemes are currently in place. Proliferation of standards necessarily brought about further changes in FFV chain governance with a huge attrition of non-compliant smallholders farmers (Dolan & Humphrey, 2000). The underlying motive of the standards and certification schemes is discussed to have both an assurance cum compliance objective to State agents amongst other stakeholders as well as promoting competitive advantage by way of introducing entry barriers in the speciality markets (Konefal, Mascarenhas, & Hatanaka, 2005; Ouma, 2010) or promoting certain credence attributes in products such as organic, natural and socially friendly attributes. According to Busch (2010) standards, play a vital role in the new globalized economy as they often replace formal legal frameworks with far more flexible and responsive law-like rules and regulations. To Busch (2010):

These differentiated standards allow firms to discipline suppliers as well as to reduce the pressures of price competition...They are market-driven in that the sanctions involved for noncompliance are not enforced by the state, but by the market. Yet it is precisely this fact that has to date made this form of governance largely invisible (Busch, 2010, 67).

Although standards are hardly sufficient to a new governance regime, effective governance through standards has incorporated additional features normally found in legal regimes. These legal regimes are characterized by Busch (2010) as Tripartite Standards Regime (TSR) that consist of standards, certification, and accreditations. TSR develops a chain of proofs through the process of having standards approved by certified bodies and further, these certifying bodies have to be accredited to do the certifications; this constitute the TSR regime. Respectively, this process is characterized into three certification levels; first level involves party certification where the seller certifies to the buyer that the product meets standard. Second level certification involves the buyer checking to ensure that the good or service offered by the seller meets the standards while third level involves Third-party certification (TPC). TPC involves independent agencies doing the checking and reporting to both the buyer and the seller. As the certifiers take up their roles, the process of TPC is put to question. How are we to know that a given certifier is reliable? The solution is to create bodies that accredit certifier attesting to their conformity to the proper standards of the certification (Busch, 2010: 67-68; Hatanaka, Bain, & Busch, 2005); a further ramification of the entire process. To Jahn, Schramm and Spiller (2005) this process is overtly costly and to Gellynck, Verbeke and Vermeire, (2006) this third party certification process mostly favours procurement agencies in their acquisition strategies compared to the ultimate consumer to whom the certification is mostly designed. This study therefore focused on the independent variable of standards and certifications under which various standards & certifications in place as well as the quality assurance schemes in place, the following hypothesis was thus tested.

H₀₄: There is no relationship between standards and certifications and competitive advantage of fresh fruits and vegetable exporters in Kenya.

The operationalisation of this determinant of standards and certifications was assessed for its efficacy in promoting competitiveness by ascertaining the types of either voluntary and public standards in place and the levels of quality assurance in horticultural value chains especially as a consequence of promoting food quality and safety (Martino & Perugini, 2006).

2.3.2. Traceability Systems

Traceability systems is in this study adopted as the moderating variable- a variable that affects the relationship between the independent and dependent variables (Goldsby, Michael Knemeyer, Miller, & Wallenburg, 2013). From the theoretical literature review, traceability fulfils the moderating role in light of the objectives relating to: information management, control and verification, supply chain efficiency, risk management and food safety. Moderating effect of traceability systems was proposed to affect the nature of governance relationships along the food supply chain by proposing loose contractual relationships largely governed by markets due to its high information base compared to previous reliance on trust- that is, prior to implementation of the traceability systems. Associated with the reduced asymmetric information, delayed rights/guarantees and transactions costs, a direct effect of improving supply chain management efficiency is obtained; while an indirect effect as a result of change to governance structures is expected (Gachukia, 2015).

The moderating variable of traceability systems was assessed from the indicators of presence and types of traceability systems in place as well as the ascertainment of the critical control points to which traceable unit logs are identified. First, asymmetric distribution of information has been attributed as the essence of many problematic aspects of food supply. All standards either public or private related to food safety and quality have a critical information element. Carlton and Perloff (1990,2) offer a prelude

to information asymmetry citing five chief reasons on why information is limited namely: (1) information varies with reliability, hence not all information needs to be processed as accurate, some may be deemed to be inaccurate; (2) information may be withheld and hence search and collection of information may be costly; (3) due to human limitation, a consumer can only retain limited amounts of information; (4) due to bounded rationality, information is processed subjectively by different actors and (5) due to limitation in knowledge on the subject in question, processing information on all products correctly is limited to lack of expertise knowledge.

Second, the International Organization for Standardization (ISO) defines quality as a function of the extent to which the set of properties and characteristics offered by a product or service satisfy the implicit or explicit needs of the consumer (Ordóñez, Zuurbier, Palau & Senesi, 2006). Quality assurance employs means such as signalling and quality labels and quality systems schemes to enhance consumer confidence. Quality is best measured as conformance to specifications; as such this study adopts the characteristics of product quality, process quality and quality systems; respectively as they measure conformance of a product, production process and through a certification process. Food quality is divided into product and process quality (Aramyan, Lansink, Vorst, & Kooten, 2007) Product quality specifies the conformance, reliability, durability, overall perception of the product by the customer (Rosenzweig, Roth, & Dean, 2003). Aramyan *et al.* (2007) also confirm that product quality consists of: product safety and health; sensory properties and shelf-life; and product reliability and convenience. Process quality is divided into: production system characteristics; environmental aspects; and marketing.

Aramyan *et al.* (2007) go further to explain that production system characteristics refer to the way a food product is manufactured and includes such factors as pesticides used, animal welfare and the use of genetic engineering. Environmental implications of agri-food products refer mainly to the use of packaging and food waste management.

Marketing efforts on the other hand determine quality attributes such as promotions, and after service, affecting quality expectation.

The main motivation for quality assurance strategies is to create quality differentiation, increase consumers' trust, and reduce exposure to risk of food safety incidents and subsequent liability cases (Hatanaka et al., 2005). However, these alternative strategies come at an added cost that is normally passed on to the ultimate consumer. Despite the additional cost for quality, the underlying character of quality assurance is the aim of giving information on conformance; from this reality, one draws the following important inferences that; (i) information issues have an impact on product and process quality in the agri-food chain; (ii) greater information shortages are correlated to stronger integration of supply chain members; (iii) enhanced traceability reduces on information cost for consumers arising from quality verification.

Asset specificity as the third indicator of traceability systems is viewed by Martino and Perugini (2006, 439) as the degree to which a resource may be re-employed without losing its productive value. (Williamson, 1989, 141-142) elaborated on six asset specific types which are related to site specificity, physical asset specificity, human asset specificity, dedicated assets, brand name capital and temporal specificity. Traceability systems would be considered to be related to physical asset specificity, brand name specificity and temporal specificity in the areas of quality assurance and consumer confidence as related to Protected Designation of Origin (PDO), Country of Origin (COO) and Private Brand and temporal specific information. This moderating variable on traceability therefore generated the following hypothesis that was tested.

H₀₅: There is no relationship between moderating effect of traceability systems on the relationship between food value chain governance determinants and competitive advantage of fresh fruit and vegetable exporters in Kenya

2.3.3. Competitive Advantage

Under resource based view and transaction value analysis theory, strategic management discusses competitive advantage to be based on the idea of having resources that are viewed in their unique or inimitable capability (Zajac & Olsen, 1993). The conceptual understanding of Competitive advantage adopted in this study is based on Newbert's (2008) definition who defines it as the degree to which a firm reduces its cost, exploits opportunities and neutralizes threats.

Competitive capabilities as elaborated by Li, Ragu-Nathan, Ragu-Nathan, and Subba Rao (2006) include; competitive pricing, premium pricing, value to consumer quality, dependable delivery, and production innovation. These indicators can be optimised objectives to food supply chain actors through the implementation of traceability. Other scholars consider the measurement of competitive advantage under the indicators of: price/cost, quality, delivery dependability, product innovation and time to market (Newbert, 2008; Porter, 1985).

Coupled with the benefits of competitive advantage; Kenyan actors in the horticultural sector have continued to strive in order to positioning themselves in the global food supply chains while meeting the demand of European Union (EU). In light of this positioning, Dolan and Humphrey (2000) emphasized the following competitive advantage indicators that have been used in the Kenyan horticultural sector; among them, we have strategies of quality, consistency, variety of the products, processing levels, product combinations, packaging, reliability of supply and price. This study adopted these indicators to the dependent variable of competitive advantage within the larger strands of cost based strategies and differentiation based strategies. This view is based on the following arguments; first, from a definition perspective whereby competitive advantage is defined as the degree to which firms reduce its costs, exploit opportunities and neutralises threats; as such competitiveness largely optimises on increasing profitability while minimising costs. Second, the foundation in which supply chain governance structures are viewed by both the TCE and RBV theories respectively;

are a direct relation to this study in the view that value chain governance determinants are related to competitive advantage; TCE theory holds that governance structures are dictated by a cost element linked to behavioural assumptions of asset specificity, uncertainty and frequency of transaction that promote transaction value as proposed by Zajac and Olsen (1993) in order to effect a harnessed governance value analysis as proposed by Ghosh and John (1999); on the other hand RBV theory as argued by Barney, portends that governance structures are a deliberate business strategy made up of decision making either in adoption market structures, intermediate or hierarchical type of governance. To Dyer and Singh (1998); Gold, Seuring & Beske, (2010) effective governance promotes competitive advantage by promoting value-creation initiatives, this is partly met through the objective of transactors' choice of a given governance structure of choice that minimizes transaction costs, thereby enhancing efficiency. As such, Dyer and Singh (1998, 232) identifies four determinants of inter-organizational competitive advantage: (1) relations specific assets; (2) knowledge-sharing routines; (3) complementary resources and capabilities; and (4) effective governance.

In view of these two theoretical stands governance is essentially either a cost based advantage in view of transactions or a differentiation based advantage based on a conscious and deliberate decision making (Soares, Dorneles, & Pereira, 2010). These sub-variables are based on the understanding that the aforementioned indicators elaborated by (Hatani, Zain, & Wirjodirjo, 2013; Ji et al., 2012; Li et al., 2006) are subsets of either cost or differentiation strategies.

2.4. Empirical Literature

Global value chain methodology explores five basic dimensions in value chain configurations: first, an input-output structure which describes the process of transforming raw materials to finished products; second, a geographical consideration which concentrates on the spatio-temporal competencies through which GVC actors operate; third, a governance dimension, which explains how value chains are coordinated and controlled; fourth, an institutional context whereby the specific industry

value chain is embedded; and fifth, upgrading, which describes the movement within the various value chains as promoted through process, products, functional or chain improvements (Gereffi & Fernandez-stark, 2011). These dimension on governance gave this study its basis in terms of establishing its empirical exegesis, its role and influence on competitiveness of agri-food value chains; while this dimension is considered as the mainstay of this study, the other dimensions are subsumed and are tacitly implied.

Governance to Cortner, Burns, Clark, Sanders, Townes and Twarkins (2001) is conceived as the act, process or power of governing. Barling (2008) contrast this view by capturing the subtleties in which the term *governing* has continually transitioned to *governance*; to him while the concept of governing relates to command and control, mostly by the State or agencies in power, there has been the lessening of States' control over economic sectors by way of seeking to extend its regulatory and strategic reach, partly through new governance forms; the latter understanding is what has largely been considered in global value chain scholarship. In the context of GVC understanding, Humphrey and Schmitz (2001, 6) related the term to be operationalized through inter-firm relationships and institutional mechanisms through which non-market coordination of activities in the chain are achieved. Governance in the context of global value chain framework thereby implies to the act of setting or enforcing parameter(s) under which others in the chain are to operate. But why does governance matter? Humphrey and Schmitz (2001, 3-4) responded by asserting that governance matters since it serves as the market access, expedites on acquisition of production capabilities, distribution of goods, leverage on policy initiatives and it aids in formal and technical assistance.

Empirically, the notions of governance and global value chains are hereby analysed from, first, Gereffi's (1999) seminal work which brings to fore the emergence of two governance drivers that relate to producer-driven global commodity chains and buyer-driven global commodity chains that relate individually to functional integration and coordination of internationally dispersed activities and actors. The producer driven chains emerge from the large manufacturer or producers that coordinate production

networks including backward and forward linkages, they are largely capital and technology intensive and mostly found in automobiles, aircraft and computer production chains; demand driven chains on the other hand refer to those industries whereby large retailers, brand marketers play a pivotal role in setting up decentralised production networks in various exporting countries largely located in third world countries. This study's empirical assessment was based on intensive interviews corroborated by US apparel import data in Apparel exports by East Asian countries: Hong-Kong, South-Korea and Taiwan to the US.

Second, Schmitz's (1999) assessment of the effect of globalisation on local cooperation in the leather footwear industry in Sino-Valley, Brazil that realised an increment in bilateral vertical co-operation while multilateral co-operation along the local value chain collapsed; the research utilised a sample survey of 65 firms and case studies in the Sino-valley. Thirdly, a sequel work by Schmitz and Knorringa's (2000) on learning from global buyers exposed the learning points shared from buyers to producers and from producers to buyers involved in the world's top leather shoes producers from China, India, Italy and Brazil; interviews to both producers and buyers of the leather shoes were conducted through in-depth interviews with 5 buyers from US and 7 from Europe. Interviews were also done in world's largest shoe fairs in Düsseldorf, Germany and corroborated with the authors previous studies; to the producers, the key lessons contributing to their value proposition related to price competitiveness, reliability, punctual deliveries, speed of response and flexibility; on the other hand the research exposed the critical germane source of power conflict which lies in buyers core competencies relating to non-production activities in marketing, product development and coordination of inter-firm activities. The research established the immanent friction and barriers to entry of shoe producers striving for chain upgrading in developing design and marketing competencies which are in the domain of buyers' core competencies.

Fourth, in revealing similar findings on limitations in upgrading opportunities in non-production activities such as design, product development and retail the apparel sector

assessment by Bair and Gereffi (2001) on the consequences of export dynamism in Torreon's blue jeans industry in Mexico revealed a considerable progress in process upgrading from simple assembly by sawing to textile trimming, laundry to distribution of full range production activities with value addition and backward linkages between 1993 to 2000. Empirical survey in this study was carried out through intensive interview in Torreon's cluster constituting 9 companies and 2 textile mills.

Fifth, empirical assessment by Humphrey and Schmitz's (2002) Sino-Valley case study served to entrench two enablers in GVCs framework; (1) transaction cost analysis with the emphasis of going beyond the dual governance forms of markets and hierarchies to introduce network and quasi hierarchical forms of governance while (2) introducing the four levels of upgrading -through products, process, functional and inter-sectoral upgrading - concept as a critical dimension in GVC analysis. Other than the in-depth case studies in garments (Gereffi, 1999); footwear (Schmitz, 1999) and electronics (Sturgeon, 2002); Dolan and Humphrey (2004) mapped out the critical influencers in coordination of the horticultural sector involving Fresh Fruits and Vegetable (FFV) exports to UK. The research noted the varied modes of governance depended on increased level of standardization of products leading to arm's length relationships while non-standardised products being coordinated through vertically integrated chains. Coordination through vertical integration was as well cited to be a resultant effect of high asset specificity and high level of monitoring in products due to variability of demand; the FFV sector was also noted to maintain an independent level of demand that provided flexibility hence avoiding obsolescence or tamed uncertainties hence networks forms of governance being facilitative by the provisions of specialised assets and competencies.

Research by Dolan and Humphrey (2004) was conducted through a survey of 8 of the 10 UK supermarkets that controlled 58.18 percent of UK's FFV market and 5 of the 6 leading exporters in Kenya who controlled 84% percent of the FFV exports to UK; this study also revealed a positioning relations where importers and retailers operated under

relational modes of governance while exporters were governed by captive forms of relations by the importers. Emergent to Dolan and Humphrey's (2004) research was the realisation of varied and multiple forms of governance in homogenous sectors especially in agri-food chains as witnessed in level of coordination, demand uncertainties, varied complexities in products, processes and regulatory measures and the position to which actors in the chain held. Ponte and Gibbon's (2005) work introduced an underlying governance form based on quality conventions that offered a dynamic source of power to lead firms that makes quality to be embedded in technical instruments such as standards and codes of conduct; this remote form of governance introduced market competitiveness by introducing abilities to convey a form of mindset, ability to capture rents by way of managing information asymmetry on quality and external certification processes; while building up on the conventional theory, this study was based on apparel and coffee case studies and previous works conducted by the authors.

Both Dolan and Humphrey (2004); Ponte and Gibbon (2005) works provide a sequel to Gereffi, Humphrey and Sturgeon's (2005) work by their specific mention of its insights in their respective works as a forthcoming publication. Gereffi et al. (2005) developed further the perspective of governance by introducing modularization as a process that reduced complexity in transaction costs; this work also elaborated three variables in which global value chains were governed namely complexity of transactions, the ability to codify transactions, and the capabilities in the supply chain; their governance theory generated five types of global value chain governance typologies- hierarchical, captive, relational, modular and captive. The article's empirical assessment was based of four sectoral case studies on bicycles, apparel, horticulture and electronics.

Whereas Gibbon *et al.* (2008) served to elaborate the systematic progression on the discourse of growth and enrichment of governance concept in the global value chains; this progress has largely been informed through sectoral case studies. Significantly, the agro-food chain sector has continually replayed the GVC configuration by manifesting a remote form of governance prompted by food safety standards codification promoted by

retailers; subsequently and resultant to globalisation, new inter-linkages in the food sector between principal actors-the farmers, processors and retailers, established new commodities described as credence goods (Murdoch, Marsden & Bank, 2000). While food products are usually classified as corresponding to experience, and prevailing credence classes. "...the quality of a product may be known before purchase (search good), after purchase (experience good) or only with difficulty even after consumption (Credence good)" (Martino & Perugini, 2006, 435).

A Credence good is a complex, new product with quality and/or safety aspects that cannot be known to consumers through sensory inspection or observations-in-consumption...The quality and safety characteristics that constitute credence attributes include the following: (1) food safety; (2) healthier, more nutritional foods (low-fat, low-salt, etc); (3) authenticity; (4) production process that promotes a safe environment and sustainable agriculture; (5) "fair trade" attributes (e.g., working conditions) (Reardon *et al.*, 2001, 425).

Governance of agri-food chains with credence attributes form the bases of the current study of Kenya's FFV horticultural value chains. In the Kenyan context, a few enumerable studies on food safety, standards and traceability exist. Oloo (2010) studied Food safety and Quality Management schemes in Kenya with an overview of the roles played by various stakeholders. Okello *et al.* (2011) studied the export standards, market institutions and smallholder farmer exclusion from fresh export vegetable high value chains as based on experiences from Ethiopia, Kenya and Zambia; this study elaborated the distinct problems that fresh fruits and vegetable exporters were experiencing, namely, how to produce safe food, how to be recognized as producing safe food, how to be competitive with large producers with economies of scale in compliance with safety requirements and how to identify cost effective technologies of reducing risks. Humphrey (2009) made an evaluation on how Kenya realigned itself to the changes in food safety regulation by the EU in his article Private Standards in Kenyan Horticulture: Did the Donors Respond Effectively to the Challenge? This article reviews the effect of

donor initiative in response to the need of Kenyan exporters achieving compliance as per the EU standards. Henson and Mitullah, (2004) studied Kenyan Exports of Nile Perch: the Impact of Food Safety Standards on an Export-Oriented Supply Chain, this study exposed the export bans that Kenya had experienced as a result threats of *Salmonella* and Cholera outbreak in lake Victoria.

A number of enumerable studies related to traceability and traceability systems have been documented in Kenya. These studies include, the studies by Siror, Huanye, Dong and Jie (2009) on “Use of RFID Technologies to Combat Cattle rustling in East Africa” and Kubasu and Wachira (2010) study on “Tackling Cattle Rustling Menace Using RFID/GPS Livestock Traceability Applications in North Rift Kenya in Kenya: Assessment of the Options and Way forward” adopted traceability systems as a tool to curb cattle rustling especially in Kenyan North Rift. Njenga, Nzuma, Karantininis, Karuri and Wahome (2012) carried out specific traceability research on Kales with the title “Analysis of the Networks and Traceability Systems on Organic Value Chains in Nairobi, Kenya”. The study was purposively done to Kale organic farmers in Nairobi Kenya with the objectives of establishing their networks and traceability systems. Internationally, specific study relating to moderating effect of traceability has been cited by Syahrudin (2011) in his study; “towards traceability in Cocoa-Chocolate Supply Chain in Indonesia”. This study made a proposition that traceability has moderating effect on performance and sustainability.

In toto, the empirical underpinning in GVC literature as outlined above is; first, it has been highly skewed to intensive case studies and in interviews; there is however the need to corroborate empirically these findings in order to validate the various assertions drawn the aforementioned case studies. Second, an important driver to the trend of governance especially through, networks, or quasi-hierarchical or hybrid forms of governance is the increasingly becoming the norm of control with the emergence of retailers who happen to be powerful global buyers (Bair & Gereffi, 2001; Dolan & Humphrey, 2000; Schmitz & Knorringa, 2000). Third, and unique to the food industry

sector is that the pressure on safety, labour, environment and sustainability standards. Continually then, the need for quality standards, conventions and codes have led to standards emerging as remote and critical governance determinants perpetuated through the high transactional codification especially in credence type of food value chains. Lastly, the large body of literature on GVC analysis has largely been consolidated from sectoral case study insights such as case studies in garments (Gereffi, 1999), footwear (Schmitz, 1999), electronics (Sturgeon, 2002), horticulture (Dolan & Humphrey, 2004), manufacturing, pharmaceuticals (Haakonsson, 2009) amongst others.

2.5. Critique of the Existing Literature relevant to the Study

This critique is guided through the review of theories adopted; critique of competitive advantage as a dependent variable and applicability of traceability in the discipline of supply chain management and its relevance as an information tool.

2.5.1. Critique of the Theories and NIE Framework

Critique of these five theories as guided by the NIE framework is first based Zajac and Olsen's (1993) view to improve on the theory of TCE by proposing a discussion that strives to surmount the criticism levelled against it. TCE theory has been critiqued as being a cost minimiser with overt emphasis of structural analysis of organisations. In their article, these authors propose to enrich the TCE theory by the proposal of; a joint value maximisation and a process based dimension propositions relevant to creating and claiming value in the inter-organisational relationship (Zajac & Olsen, 1993, 132). These two propositions are elaborated as follows. Transactional value perspective emphasises that "the minimisation of transaction costs associated with pre-empting opportunistic behaviour may be less relevant than maximising net present value in the exchange relationship". To them while process emphasis is created through the analysis of inter-organisational strategies. These processes are actualised in three stages, namely: Initialising, processing and reconfiguring stages.

Initialising stages are characterised by firms engaging in the process of projecting the benefits and values that the partnerships will generate and the cost involved. This process is related to the TCE analysis of assessing *ex ante* contracting costs (Williamson, 1985: 20). The second stage is the actual processing stage where the forecast over which value creating exchanges by the two firms are expected to occur as well as a value reclaiming in case of conflicts amongst the partnering firms. The third stage is the reconfiguring stage where the firms are expected to re-assess the relationships either for the purposes of continuity or else for preparation of exit (Zajac & Olsen, 1993).

Coupled with the same rigour as Zajac and Olsen (1993); Madhok's (2002) view of triangular alignment hypothesis further elaborated the need for TCE to reconcile with the resource based view (RBV) theory in creating the value of competitive advantage. In his critique to TCE theorists, he asserted that the choice of governance arrangements is primarily influenced by transaction attributes and ignored resource attributes and governance skills that are at the realm of resource based view theory.

A truly strategic theory of the firm should address not just the decision with respect to hierarchical governance or market governance, ... but also take into account how a firm's resources and capabilities can best be developed and deployed in the search for competitive advantage (Madhok, 2002, 541).

Halldorsson *et al.* (2007) augmented the choice of TCE, PAT and PRT theories from the view of NIE and complementarily of theories. TCE, PRT and PAT were viewed to be valuable when it came to the issue of how to structure supply chains, in that: First, they facilitate establishment of SCM's core and non-core activities for strategic cost purposes; second, these theories characterise the roles, positions, and responsibilities of the participants in the supply chain; thirdly, TCE, PRT and PAT can be utilised to safeguard against the risk of opportunism; and fourthly, these theories also answer to the questions on how incentives can be aligned internally and between the participants in order to further the outcomes of the supply chain actors (Halldorsson *et al.*, 2007, 291).

However, TCE, PRT and PAT have shared limitations due to their embedded assumptions about human behaviour and the static view of the firm's boundaries. Halldorsson *et al.* (2007) apply two complementary theories of NT and RBV in order for study of SCM to be informed in matters regarding the dynamics of governance structures and inter-organisational relationships.

Mahoney (2012) justifies that developing PRT of the firm enables RBV theory to expand on the concept of sustainable competitive advantage. The common aspects of both theories is that they rely on market frictions of boundary ownership and firm resources economic rents to its rare, inimitable and non-substitutionable resources (Mahoney, 2012).

2.5.2. Critique on the application of Competitive Advantage

While the two theoretical strands based on based on TCE and RBV define competitive advantage as a cost based advantage or a differentiation strategy respectively, this study is alive to the ongoing discourse on the use of competitive advantage use as a dependent variable and its inference to superior performance. In light of this discourse, this study recognises the review done by Sigalas and Economou (2013) that identified fallacies that are based on its conceptualization of competitive advantage from the majority of literature; with some of the problems stemming from multiple meanings of competitive advantage, namely: first, challenges of operationalizing the construct of competitive advantage. By definition competitive advantage to many scholars is related to sources of -cost leadership, focus, differentiation- or in terms of superior performance such as profitability, returns, rents and value creation. Second, the challenge relating to interchangeability of concepts of competitive advantage and superior performance as used by researchers is highlighted as the “the dependent variable problem in strategic management’s empirical research... arises when researchers infer existence of competitive advantage from *ex post* superior performance and conclude that creating competitive advantage *ex ante* will produce superior performance” (Sigalas & Economou, 2013: 72-73).

In light of this foregoing discourse this study first, applied the conceptual meaning of competitive advantage from the definition of Newbert, (2008) in that competitive advantage is conceived as the degree to which a firm reduces its cost, exploits opportunities and neutralizes threats. Second, while Sigalas and Economou (2013) elaborated the challenge of inference and interchangeability of terms relating to competitive advantage and superior performance, this study adopted the constructs of competitive advantage simply on the reasoning of whether a horticultural value chains adopt competitiveness on the bases of their cost minimising strategies or by differentiation strategies as informed on the theoretical review based on TCE and RBV theories without being confounded by the polarity inference between superior performance being resultant to competitive advantage or vice versa.

2.5.3. Critique on the Application of Traceability Concept

Research on traceability in the food supply chains articles span to different scientific fields; some of the fields relate to supply chain management, strategic management, engineering, and economics (Ringsberg, 2011). The framework of supply chain management (SCM) identifies a wide application of the concept of traceability if fully adopted, this follows from the following views: First, SCM offers the coordination to supply chain actors; this interface by supply chain actors is facilitated by information flows relating to production and dissemination of relevant information along the supply chain. The framework for food traceability in EU legislation would benefit largely from this integrative function of SCM.

Second, Canavari, Centonze, Hingley and Spadoni (2010), argue that the principal interpretation of traceability is derived from statutory definition; largely based on the European Union's regulation 178 of 2002 that was promulgated on 1st January 2005. The EU regulations are clear concerning the implementation of regulation in practice but the methodology is not clearly spelt out. Folinas, Manikas and Manos (2006), spelt out that EU regulation did not have a "specific methodology to be followed by all food business operators"; Olsson and Skjöldebrand (2008), as well reiterated explaining that

the EU regulation on food safety demands that companies focus more on supply chains. The legislation does not cover what happens after the retailer has sold the product to the consumer; it essentially covers “one step backwards” and “one step forward”. This indicates that customer perspective of the food value chain is largely missing in the research on traceability and food safety, although the consumer is part of the chain that evaluates the added value to the product that is produced. Stemming from the same argument, Folinas *et al.* (2006) clarified that traceability information flow in the supply chain can be distinguished in two types: one step up one step down information flow and aggregated information flow. According to one step up one step down model, the final consumer receives only the necessary information that allows the identification of some of the identification features of the product.

Third, in confirming the position of traceability in a wider discourse, Canavari *et al.*, (2010) affirmed the role of SCM by suggesting that traceability be viewed beyond “legal and baseline definitions and expectations in order to define and use the concept from the perspective of supply network actors”; on the other hand, Olsson and Skjöldebrand (2008) proposed the widening of scope since previous research on food safety and traceability was focused on local risk management within one company. To them, “It is therefore impossible to analyse and evaluate benefits of increased traceability and supply chain risks in an entire supply chain” (p. 49). However, the full benefits of full traceability have not been achieved since full implementation of the traceability systems is usually not integrated by all supply chain actors (Kelepouris *et al.*, 2007). The lack of traceability implementation in the entire supply chain is seen to majorly impinge on visibility of the entire chain which further impairs proactive strategies of identifying the critical control points; this ultimately erodes customer confidence and trust on food safety and food quality.

2.6. Research Gaps

The National horticultural draft policy of the Republic of Kenya 2012, highlighted some pertinent issues that are related to this study (GoK, 2012). These issues included: First, research inadequacy that had not embraced the value chain approach thus leading to low quality products, limited product development and marketing. This study being supply chain management based, sought to address this gap by evaluating the nature of agri-food value chain processes through which supply chain processes and products were highlighted.

Second, the policy dedicated a section on traceability as an important component of trade. It however noted the challenge that there was inadequate implementation of regulatory and administrative measures. The policy proposed an intervention through stakeholders involvement to ensure that traceability mechanisms are in place and operational. This study in part enriches and add value to the policy by situating the moderating effect of traceability in the relationship between food supply chain governance determinants and competitive advantage.

Third, the policy noted that Kenya's exports are largely in semi-processed and low value produce which account for 91 percent of total agricultural related exports. The demand by major importers such as European supermarkets supply chains had over the years gradually demanded for packaging and processing considerable amounts of the exported vegetables; this called upon Kenyan exporters to focus in value addition by erecting more cold chain facilities and pack-houses in order to meet this growing demand. This study meet this gap by characterising the entire fresh fruit and vegetable value chain by giving empirical evidence on the status of products' value addition and the role played by pack-houses and cold chain related facilities.

Fourth, under the legal and institutional framework, the national policy recognised the current legal and regulatory frameworks that govern the industry as established by the Kenyan parliament and subsidiary legislations. The horticultural sector was also

cognisant of being influenced by international standards, protocols, conventions, treatises. Standards and certification formed a key objective to this study and explored the proliferation of standards and their influence to the FFV horticultural sector in so far as food value governance was concerned and in the way the legislations continued to affect the smallholder farmers in meeting the demands enshrined in these food regulations.

The discourse on traceability from the discipline of supply chain management, is in essence a supply chain management agendum. Supply chain management was considered as the integration of key processes from end user to the original suppliers by provision of products, services, and information that adds value for customers and other stakeholders. This study was therefore situated on the premise that traceability was conceived as an information production process which could not be delinked from supply chain. While the EU public regulation specified what traceability is, it however did not give a methodology of its implementation; as such supply chain management discipline offers to answers to both the methodological question and the general framework through which the discourse on traceability could take place by broadening the scope of traceability to include the entirety of the supply chain processes.

While Vlachos (2014) noted the paucity of research in supply chain management that has paid to supply chain governance, its determinants and how it evolves; similar sentiments had been echoed by Gellynck and Molnár (2009); Richey *et al.* (2010). As such, a gap in current literature on supply chain governance exists due to the interdisciplinary nature of supply chains, this study therefore sought to empirically ascertain the identified determinants in literature.

Overall, despite the rich scholarship in GVC research the dependence of its insights have largely been based on in-depth case studies including garments (Gereffi, 1999), footwear (Schmitz, 1999), electronics (Sturgeon, 2002) and horticulture (Dolan & Humphrey, 2000); the call for empirical testing by scholars such Dallas (2015); Gellynck and Molnár, (2009); Ghosh and John, (2005); Hammervoll (2011) was in this

research seconded and corroborated; this study sought to fill on this existing gap by optimising on empirical assessment through the exploratory approach of identifying value chain governance determinants affecting competitiveness of Kenya's fresh fruits and Vegetables exporters.

2.7. Summary of Literature Reviewed

This chapter discussed the theoretical literature that elaborates on the five theories adopted in this study namely; Transaction Cost Economics (TCE), Property Rights Theory (PRT), Principal Agency Theory (PAT), Network Theory (NT) and Resource Based View (RBV) and the way they related to the study. Conceptual framework defining the relationship between food value chain governance determinants, traceability systems and competitive advantage are evaluated as independent, moderating and dependent variables respectively. A critique to the theories and empirical literature was outlined and finally research gaps identified through which this study sought to add empirical value.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter described the research design and methodology that was used in the study. This included research philosophy, research design, population, sampling size and technique. The chapter also included data collection instruments, pilot study, reliability and validity of data collection instruments, measurement, data analysis, statistical model and hypotheses testing.

3.2. Research Philosophy

There are three epistemological positions: realism, interpretivism and positivism (Scotland, 2012). Any research is conceived to have a particular research paradigm. A paradigm is conceived as an abstraction of reality it is thus a lens through which the world or reality is perceived or conceived. A research paradigm on the other hand consist of four substantive precepts namely; ontology, epistemology, methodology (Frankel, Naslund, & Bolumole, 2005; Wilson, 2001) and axiology. Ontology being concerned with the reality in question, whether in this case reality is physical or metaphysical. Epistemology is appreciated simply as the study of knowledge; it seeks to establish how we think about a reality or better still how we know what we claim to know. Axiology as the third precept is based on a set of morals and a set of ethics norms or the value propositions applied by the said research.

This study was characterized to follow a deductive positivism paradigm. The line of argument for hypothetical-deductive model follows the path of reasoning from a general law to a specific case; more specifically deductive reasoning as a theory testing process, commences with an established theory or generalization, and seeks to test whether the theory applies to specific instances (Spens & Kovács, 2006). General conclusions were then drawn on the augmentation or falsification of the hypotheses through empirical

testing. Notable characteristic of deductive research was the prior development of hypotheses prior to testing and generalizing the results. The generalizations and discussions were done in light of prior knowledge this helped in deriving new knowledge (Spens & Kovács, 2006).

3.3 Research Design

Research design defines the overall research study or study's purpose; it also drives the choice of a research methodology following from the research problem and objective and hence offers a strategy for testing the hypotheses set out in a given research (Pinsonneault & Kraemer, 1993). This study's design was based on the assessment of food value chain governance determinants and competitive advantage of horticultural exporters in Kenya. As a result, a methodological triangulation was adopted to assess this study. This study links the overall plan by relating the conceptual research problem to relevant and practical empirical research (Ghuri & Grønhaug, 2010) by way of data collection, measurement and analysis.

This study adopted a descriptive research design whereby data was collected in order to test hypotheses and to answer current status in the study on the relationship between food value chain governance determinants and competitive advantage in Kenya's horticultural exports. This study was conducted by means of a cross section survey; the unit of analysis consisted of each of the respective exporting firms in the horticultural sector (Malhotra & Grover, 1998; Pinsonneault & Kraemer, 1993). Methodological triangulation was also adopted by application of both qualitative and quantitative data analysis (Easterby-Smith, Thorpe, Jackson, & Lowe, 2012; Mangan, Lalwani, & Gardner, 2004). This approach was contextualised as per Golicic and Davis (2012) view of affirming that qualitative methods were used as the starting point to thoroughly review appropriate literature in order to develop a conceptual framework that specified relevant variables and expected relationships among them, this was culminated by hypotheses formation. Data was then collected through the questionnaire instruments and evaluation was done by testing the hypotheses. This was done to ascertain the

strength of the proposed relationship. Methodological triangulation was supported by scholars and has been conceived method that corroborates both qualitative and quantitative research methods (Johnson & Onwuegbuzie, 2004) and hence curbing limitations of single method approaches (Hussey & Hussey, 1997).

3.4. Target Population

Population in this study was understood as the complete enumeration of all items in a given study of whom inference is made to all possible cases pertaining the given study (Sekaran & Bougie, 2013). The population of this study constituted exporters of fresh fruits and vegetables in Kenya registered with FPEAK as well as exporters registered with Horticultural Crops Directorate's pack-house who in total consisted of 120 members; this population was arrived at from list of the population of Horticultural Crops Directorate export members who were registered as 1471. Some of the licences for some of these exporters had expired as of 30th November, 2015 when the data on the number of exporters was received; further some exporters were not in the fresh fruits and vegetable export business which was the focus of this study such as members in floriculture and were therefore excluded. The active list with traceable addresses such as emails, phone numbers and physical location was thus retained at 120. As per Bartlett, Kotrlik and Higgins (2001) suggestions on determination of a sample or population to be used in a given research, other than the use of formulae such as Cochran's and insights given by Krejcie and Morgan (1970) related studies conducted in the same sector may be referred to; in such similar circumstances research conducted by Awino, Muchara, Ogutu and Oeba (2012) in the said sector and having encountered similar challenges, the researchers worked with 108 exporters who had active and traceable addresses from the 1390 companies registered with the then horticultural crops development authority in June, 2010.

Further to meeting the aforementioned requirements, the 120 exporters were as well found to be registered with FPEAK and/or registered with the HCD pack-house for processing their produce in readiness to export; since both the FPEAK and HCD were

compliant with the European Union market regulations, the population was considered homogenous for the study on the relationship between value chain governance determinants and competitive advantage in the export sector.

3.5. Sample and Sampling Technique

According to Israel (1992), census technique is largely considered to be attractive for small proportions for instance of two hundred or less; it eliminates sampling error and provides data on all individuals in the population with precision and accuracy. This study adopted to use a census technique to collect data from the 120 exporters selected; while the earnest intentions for the census was to access information about every member of this population, the research only realised to get information from 83 members of the 120 previously considered. The informants from this population were management staff either the Directors, Quality Assurance Officers, Agronomists, Business Development Managers or Pack-house Supervisors levels in the their respective organisations.

3.6. Data Collection Instruments

This study was conducted principally through a self-administered questionnaire. The questionnaire was either self-administered and picked later after filling, returned by email to the researcher or filled in the presence of the research or appointed research assistants. The choice of these instruments related to their relative stable use, ease of administering and dependability; this approach was affirmed also by Frankel, Naslund and Bolumole (2005) research on methods between 1999-2004 in logistics research; the findings indicated that that 51 percent of the researchers utilized surveys as the primary research method followed by interviews with 27.1 percent.

3.7. Data Collection Procedure

Data was collected using self-administered questionnaires; this was based on the conditions of ease of access to the informants as well as the ease of administration of the questionnaires to informants who may have needed elaboration. Similarly, Atilgan and McCullen (2011) successfully carried out a research through self-administered questionnaires and interviews to ascertain on supply chain performance assessment to change management in a case study conducted in a UK company.

3.8. Pilot Test

Pilot study was carried out to establish the accuracy and appropriateness of the research design and data collection instruments. Pilot testing was conducted to ensure that the wordings or the questions' contents are well understood (Soon & Udin, 2011). Elimination of defective questions relating to loaded questions, double questions, ambiguous questions, inappropriate vocabulary or questions with missing alternatives (Hunt, Sparkman, & Wilcox, 1982). Pilot testing of the instrument was conducted to 10 percent of the census in order to ascertain the instrument's validity and reliability (Hunt et al., 1982); this translated to 12 respondents. Actual number of respondents involved in the study other than the respondents to the questionnaire were 83.

3.8.1. Reliability of Data Collection Instruments

The research adopted the understanding of reliability as defined by Dunn, Seaker and Waller (1994, 159) to mean "internal consistency of the items that are used to measure a latent construct". Reliability was thus adopted in order to ensure that the questionnaire delivered consistent scores that other researcher(s) could corroborate the same desired information as the original instrument used and to the same targeted group. Reliability was related to the accuracy of the scale; it was measured in this study using Cronbach's coefficient alpha that measures consistency within the instruments and questions and

how well the set of items measured to a particular behaviour of characteristics within the test (Punniyamoorthy, Thamaraiselvan, & Manikandan, 2013).

Bryman (2012) recommended a score value of not lower than 0.8 Cronbach's Alpha (α) for reliability test. Cronbach's alpha (α) was computed as follows:

$$\alpha = K / (K - 1) [1 - (\sum \sigma_k^2 / \sigma_{total}^2)] \quad \text{-----Equation (1)}$$

where K is the number of items,

$\sum \sigma_k^2$ is the sum of the k item score variances, and

σ_{total}^2 is the variance of scores on the total measurement (Cronbach & Shavelson, 2004). The pilot test was therefore used to correct the deficiencies before the final questionnaire was compiled and distributed.

3.8.2. Validity of Data Collection Instruments

Validity is understood as the extent to which a research instrument may be said to commensurately measure a trait or the degree to which an instrument measures what it purports to measure (Abbott & McKinney, 2013; Bryman, 2012). Validity of the questionnaire was assessed for external validity and internal validity. Dunn et al. (1994, 152) defined both external and internal validity as the "extent to which experimental results can be applied to other scenarios... Internal validity indicates the degree of accuracy at which the test variables and the experiment measure the conceptualized variables and the relationship respectively".

Validation consisted in defining constructs used clearly from the literature; elaborate discussion of constructs in the literature gave content validity. This study adopted both content and construct validity. Dunn et al. (1994, 157) affirm that content validity "exists when the scope of the construct is adequately reflected in the items as a group".

On the other hand, construct validity is related to how well a scale of a construct actually measures the construct or otherwise described as the degree of measure of a given construct or actually what an instrument is actually measuring (Khalid, Hilman, & Kumar, 2012; Malhotra & Grover, 1998). Abbott and McKinney (2013) concur by stating that construct validity checks whether a measure of a concept relates strongly with another measure that it should strongly correlate with and negatively with measures it should not agree with; otherwise spelt by Malhotra and Grover (1998) as the convergent and discriminant validity whereby the measure is respectively similar to itself and yet sufficiently distinct and different from other measures.

3.9. Measurement and Scaling Technique

Measurement entails the assignment of real numbers to some characteristic or attributes according to specified rules while scaling involves development of systematic rules and meaningful units of measurement to represent empirical observations (Wrenn, 1997). This study primarily used categorical nominal scales through dichotomous questions to measure the research's objectives as well as enriching the collection of primary data. Likert-Scale and open-ended questions were also used to give respondents an opportunity to add information which may not have been included in the closed-ended dichotomous questions.

The choice of the categorical nominal scale was largely in consonance with properties of information sought for the governance determinants and competitive advantage constructs that related to gathering, analysing and comparing the survey responses as related to the various horticultural sector players (Wrenn, 1997). Of greater interest to this study was the practical value of the resulting scale to measure the appropriate variables by using the proper scaling model that would provide the diagnostic ability to establish the various value chain governance determinants and their contribution to the horticultural sector's competitiveness.

3.9.1. Measurement of Independent Variables

This study used a dichotomous scale to obtain a Yes or No answer, open ended questions too allowed the respondents to add information that might not be captured in the closed-ended questions. The hypotheses to test the relationship between food value chain governance determinants and competitive advantage were be measured through multiple regression mode.

Nature of transaction was measured through frequency of transactions, complexity of transaction and ability to codify transactions; nature of contract was determined by degree of coordination, types of contract applied and ownership rights; standards and certification sub-variable was determined by the number of standards and certification schemes used, quality assurance procedures, presence and procedures of product recall; level of chain integration was determined by internal integration, supplier integration & capability of supply base and customer integration; traceability systems were determined by types of traceability systems, control and verification tools, critical control points. The study sought to ascertain the determinants that constitute value chain governance.

3.9.2. Measurement of Dependent Variable

Reduction of costs, exploitation of opportunities and neutralisation of threats were used to guide the measurement of competitive advantage of the sector. Competitive advantage indicators used were largely based on quality, consistency, variety of the products, processing levels, product combinations, packaging, reliability of supply and price. Competitive advantage was measured by cost based advantage and differentiation-based advantage indicators. The hypotheses testing of the relationship between food value chain governance determinants and competitive advantage was measured through multiple linear regression model. Correlation analysis was used to establish whether there was correlation between value chain governance determinants and competitive advantage. The study ascertained the causal effect between the independent variables to the dependent variable.

3.9.3. Measurement of Moderating Variable

Measurement of the moderating variable of traceability systems was assessed from the indicators on presence or absence of traceability systems, types of traceability systems in place as well as the ascertainment role of traceability systems in critical control points to which traceable unit logs are identified. The study sought to ascertain the moderating effect of traceability systems or lack thereof between food value chain governance determinants to the competitive advantage. The hypotheses testing of the moderating relationship between food value chain governance determinants and competitive advantage was measured through moderated multiple regression (Aguinis, 1995; Aguinis & Gottfredson, 2010).

3.10. Data Analysis and Processing

Upon data collection and collation, data analysis was conducted to determine consistent patterns by way of summarizing the relevant details revealed in the investigation. Data processing involved editing, classification and tabulation of data collected so that they are easily analysed. Quantitative data in this study was analysed using descriptive statistics. The purpose of descriptive statistics was to meaningfully describe the distribution of scores or measurements using a few indices or statistics, with the types of statistics or indices used being dependent on the type of variables in the study and the scale of measurement (Svensson, 2001).

To determine if associations existed between various variables, cross-tabulation was used. Cooper and Schindler (2008) define cross-tabulation as a technique for comparing two classification variables using tables with rows and columns that correspond to the level or values of each variables categories; a means to investigate associations on factors to a given variable (Mohn, 1990). To determine whether values calculated for cross-tabulations were statistically significant, Chi-square was used, with value of $p < 0.05$ being indicative of statistical significance.

3.11 Diagnostic Tests

3.11.1 Multicollinearity Test

This study tested for multicollinearity in the independent variables. Multicollinearity test was aimed at assessing the presence of the undesirable situation where correlations among the independent variables are strong (Belsley, 1991; Belsley, Kuh, & Welsch, 1980). To test for multicollinearity, correlations between all pairs of independent variables were computed. Variance Inflation Factor (VIF) measure to multicollinearity was used following the logic that if no two independent variables were correlated, then all the VIFs would be 1. The value of the VIFs were assessed against the standards thresholds (4 and 10) used as the rule of thumb in extant literature (O'Brien, 2007); if one of the variables was around or greater than 5, there would be the presumption of multicollinearity associated with that variable. In this case the said variable would be removed from the regression model.

3.11.2 Analysis of Variance

Analysis of Variance (ANOVA) was employed to test the hypothesis that there was no significant difference between value chain governance determinants and competitive advantage. The basic principle of ANOVA was to test for differences among the means of the populations by examining the amount of variation within each of these samples, relative to the amount of variation between the samples (Kothari, 2004). Specifically, one-way (or single factor) ANOVA is a way to test the equality of three or more means at one time by using variances. That is the term one-way, also called one-factor, indicates that there is a single explanatory variable with two or more levels, and only one level of treatment is applied at any time for a given subject. To test the null hypothesis (H_{01} to H_{05}), one-way ANOVA was employed. Gyau and Spiller (2008) used one-way ANOVA in their study on the impact of supply chain governance structures on the inter-firm relationship performance in agribusiness.

Levene's test on homogeneity of variance was conducted with the interpretation of having p value = 0 being interpreted to mean the ANOVA test results were significant and that the study would reject the null hypothesis if computed $F > F_{critical}$ at 95% confidence interval (Gastwirth, Gel, & Miao, 2009; Loh, 1987).

3.11.3 Test for Outliers

This study also tested for outliers. Abbott and McKinney (2013) defined an outlier as an extreme case that distorts the true relationship between variables, either by creating a correlation that should not exist or suppressing a correlation that should exist. Miles and Shevlin (2001) posit that outliers are peculiar or suspect scores that lie outside the usual range of scores that would be expected for a particular variable. In multivariate data, outliers for ordinal variables are those units representing an unusual combination of the categories or of the ranks of the variables (Aguinis, Gottfredson, & Joo, 2013; Riani, Torti & Zani, 2012).

The outliers were tested in this study through computing Mahalanobis distance for each sample, with outliers being identified as those samples yielding large values of Mahalanobis distance (Webb & Copsey, 2011). The Mahalanobis distance was calculated from the leverage value; the advantage of the Mahalanobis distance is that it is possible to use the distances as a value with a known distribution, which can then be tested for significance, by finding its associated probability (Miles & Shevlin, 2001).

For cases with multiple independent variables, it was calculated using:

$$MD_i = (N - 1) (h_i - (1/N)), \text{-----Equation (2)}$$

Where MD_i is Mahalanobis distance;

h_i is the leverage statistic for the i th case, and

N is the number of participants.

3.11.4 Test for Common Method Variance

Common-method variance (CMV) is a systematic error variance shared among variables measured with and introduced as a function of the same method and/or source (Richardson, Simmering, & Sturman, 2009). It is the false variance that is attributable to the measurement method rather than to the constructs the measures represent (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Method biases are a problem because they are one of the main sources of measurement error. Measurement error threatens the validity of the conclusions about the relationships between measures and is widely recognized to have both a random and a systematic component (Lai, Li, & Leung, 2013; Podsakoff et al., 2003). Although both types of measurement error are problematic, systematic measurement error is a particularly serious problem because it provides an alternative explanation for the observed relationships between measures of different constructs that is independent of the one hypothesized.

One of the main sources of systematic measurement error is method variance is cited to arise from a variety of sources such as content of specific items, scale type, response format, and the general context. However, regardless of its source, systematic error variance can have a serious confounding influence on empirical results, yielding potentially misleading conclusions (Richardson et al., 2009). To test for common method variance, three ex post techniques can be used: the correlational marker technique, the confirmatory factor analysis (CFA) marker technique, and the unmeasured latent method construct (ULMC) technique (Richardson et al., 2009).

This study used the CFA marker technique because of its ability to model random error in the marker and substantive constructs and the ability to model common method variance at the item level, and thus the ability to account for non-congeneric –“that is CMV has relatively equal effect on all constructs” (Johnson, Rosen, & Djurdjevic, 2011) and congeneric common method variance (Williams, Hartman, & Cavazotte, 2010).

Factor analysis was employed in order to identify the constructs that will then be regressed against the dependent variable (Cooper & Schindler, 2008). Gyau and Spiller (2008) conducted factor analysis in their study on the impact of supply chain governance structures on the inter-firm relationship performance in agribusiness. The study used categorical principal component analysis (CATPCA) also known as nonlinear principal component analysis (PCA) (Linting & van der Kooij, 2012; Meulman, Van der Kooij, & Heiser, 2004) owing to the categorical nature of the variables under the research study.

The use of CATPCA was aimed at reducing the observed variables to a number of uncorrelated principal components which are explained as the key components associated to value chain governance determinants on the competitiveness of Kenya's horticultural exports. Categorical principal component analysis (CATPCA) was adopted to principal component analysis (PCA) method; the latter is largely meant to reduce the number of given variables to a smaller number of uncorrelated variables called principal components which account for the variance in the data as much as possible.

While PCA is suitable for continuous variables which are scaled at the numerical level of measurement such that interval or ratio it also assumes linear relationship among variables, it is thus not an appropriate method of dimension reduction for categorical variables (Kemalbay & Korkmazoğlu, 2014) CATPCA thus presented several advantages over standard PCA. First, CATPCA allows incorporating nominal and ordinal variables; second, it does not assume that the relationships between variables are linear, and can therefore handle nonlinear relationships between variables (Claveria & Poluzzi, 2016). This is explained by the nature of categorical variables whereby unlike numerical variables, they are described by indicators with a limited number of categories. The zero in binary variable scales is uncertain, the relationship among the different categories is also unknown, and although some of the variables are composed of categories that are ordered, their mutual distances are as well unknown; so the method of CATPCA is thus adapted (Antonelli & Taurino, 2009) to curb for this shortcoming.

Third, CATPCA can also handle well small data (Odekerken-Schröder, Hennig-Thurau, & Knaevelsrud, 2010).

In order to test the relationship between value chain governance determinants and competitive advantage, the model fitness, significance of results and consequently the validity of findings, regression analysis were done (Cooper & Schindler, 2008). Regression analysis was used to infer causal relationships between the independent and dependent variables.

Lastly, in order to test the effects of the moderating effect of traceability systems, the study employed moderated hierarchical regression analysis. In hierarchical multiple regression analysis, the research determined the order that variables were entered into the regression equation (Boon-itt & Wong, 2011).

3.12 Statistical Model and Hypothesis Testing

In accordance to the literature review the following functional relationship among the dependent and independent variables:

$$CA=f(NoT, NC, SC, LCI). \text{-----Equation (3)}$$

Competitive advantage (CA) is represented as the dependent variable and is a function of Nature of Transaction (NoT), Nature of contract (NC), Standards and Certifications (SC) and level of chain integration (LCI) independent variables.

This study used multiple linear regression to test the relationship between value chain governance determinants and competitive advantage. The multiple linear regression model shown below was used:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \text{-----Equation (4)}$$

Where:

$\beta_1, \beta_2, \beta_3, \text{ \& } \beta_4$; corresponding to the estimated parameters

$X_1, X_2, X_3 \text{ \& } X_4$; independent variables

Y = Competitive Advantage,

X_1 = Nature of Transaction,

X_2 = Nature of Contract,

X_3 = Level of Chain Integration,

X_4 = Standards and Certifications,

β_0 = Constants or the intercept, and

ε = Error term.

Moderated multiple regression (MMR) statistical tool was used to test whether traceability systems moderated the relationship between value chain governance determinants and competitive advantage. Moderated multiple regression was suited to this study because it enabled the slope of one or more of the independent variables to vary across values of the moderator variable, thereby facilitating the investigation of an extensive range of relationships and function forms (Aguinis, 1995; Aguinis, Beaty, Boik, & Pierce, 2005). Moderated multiple regression also permitted the multiple relationships between the dependent variable and independent variables to depend on the levels of the other independent variables in the study. Estimating interaction effects using moderated multiple regression usually consists of creating two ordinary least squares (OLS) regression equations involving scores for a continuous predictor variable Y, scores for a predictor variable X, and scores for a second predictor variable Z hypothesized to be a moderator (Aguinis, Gottfredson, & Wright, 2011)

The first equation which shows the ordinary least squares (OLS) regression equation for a model predicting y scores from the first-order effects of X and Z observed scores will be:

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + \varepsilon \quad \text{-----Equation (5)}$$

where β_0 = least squares estimate of the intercept,

β_1 = least squares estimate of the population regression coefficient for X observed scores, β_2 = least squares estimate of the population regression coefficient for Z observed scores, and ε = error term.

The second equation, the moderated multiple regression model was formed by creating a new set of scores for the two predictors (that is, X, Z), and including it as a third term in the equation, which yields the following model:

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 X.Z + \varepsilon \quad \text{-----Equation (6)}$$

where β_3 is the least squares estimate of the population regression coefficient for the product term scores.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1. Introduction

In this chapter presents empirical findings and the results of the study with the main aim of addressing the research objectives. The techniques specified in chapter three are applied. The section starts with the response rate, reliability analysis, demographic data, descriptive analysis, component analysis, correlation analysis, regression analysis and finally discussion of research findings.

4.2. Response Rate

A total population of one hundred and twenty respondents who constituted the census were used in the study. Eighty three respondents (83) filled and returned the questionnaire; a response rate of 69.1% was achieved from the survey. In achieving this response rate, the researcher met the respondents in their work places and mostly so in the pack-houses where various value adding processes were being conducted such as sorting, grading, trimming, weighing, packaging and cooling. The respondents were explained to of the purpose of the study and they were informed of their rights to voluntary participation while assuring them of their confidentiality before administering the questionnaire. Depending on the choice of the respondents, the questionnaires were given to the respondents to complete in a week's time or else the respondents also committed to specific time where either the researcher or the research assistants would be available for clarification while the respondents answered the questionnaire. Fincham (2008) suggested a response rate of 60% as an acceptable rate which has been expected by most journal editors; the response rate of 69.1% in this study was perceived as sufficient.

4.3. Diagnostic Tests

4.3.1. Reliability of Results

Consistency and stability in measurement of a research instrument is understood as reliability. Alpha scores ranging from zero (no internal consistency) to one (complete internal consistency) have been furnished under the rule of thumb as furnished by Cronbach's Alpha values of 9 and above being 'excellent', 8 to be 'good', 7 to be 'acceptable', 6 to be considered as 'questionable', 5 to be deemed 'poor' and less than 5 to be 'unacceptable' (George & Mallery, 2003). In this study reliability of the instrument against the proposed constructs was tested as shown in table 4.1.

Table 4.1: Summary of Reliability of Cronbach's alpha Reliability Coefficient

Variables	Number of Items	Cronbach's alpha
Nature of Transactions (X ₁)	9	0.864^a
Nature of Contract (X ₂)	12	0.885^a
Level of Chain Integration (X ₃)	27	0.959^a
Standards & Certifications (X ₄)	7	0.937^a
Competitive Advantage	37	0.970^a

a. Total Cronbach's Alpha is based on the total Eigenvalue.

Nature of transactions had alpha of 0.864, Nature of contract had 0.885, level of integration had 0.959, Standards & certifications had 0.937; competitive advantage had an alpha of 0.970. The total Cronbach's Alphas in these constructs was based on the total Eigenvalues derived from the categorical principal component analysis of each of the variables (Green, 1983; Yang & Green, 2011). This shows a strong internal consistency in the variable item measures.

4.3.2. Validity of Results

Levene's test on homogeneity of variance was conducted with the interpretation of having p value = 0 being interpreted to mean the ANOVA test results were significant and that the study would reject the null hypothesis if computed $F > F_{critical}$ at 95% confidence interval (Gastwirth et al., 2009; Loh, 1987). In actual case since the study adopted CATPCA analysis procedure that is largely non-parametric, a non-parametric Levene's test was adopted to verify the equality of variances. The study sample on homogeneity of the variance revealed that the P-value 0.342 was greater than P value of 0.05 sample (Nordstokke, Zumbo, Cairns, & Saklofske, 2011).

Validity of results was also tested in this study against each of the hypotheses through the Durbin-Watson test statistic on the assumption of validity of the independent variables as shown in table 4.2

Table 4.2: Summary of Durbin-Watson Test Statistic

Variables	Durbin-Watson Test Statistic
Nature of Transactions (X_1)	2.050
Nature of Contract (X_2)	1.997
Level of Chain Integration (X_3)	2.015
Standards & Certifications (X_4)	2.078
External Contingencies	1.937

In this study validity of the variables was ascertained by Durbin Watson Test statistic the range of 1.950 and 2.050 was observed. Nature of transactions had a Durbin-Test statistic of 2.050, Nature of contract had 1.997, level of integration had 2.015 and Standards & certifications had 2.078; competitive advantage had an alpha of 0.970.

4.4. Demographic Data

4.4.1 Business Ownership

Understanding the nature of business ownership that horticultural exporting firms was important in order to establish the extent of liability, challenges in transferring ownership, sourcing for capital and the legal entity of the business as well as factors related to State's compliance. The summary presented in table 4.3 provides forms of horticultural firms' ownership.

Table 4.3: Business ownership

Forms of Ownership	Frequency	Percentage
Sole Proprietorship	7	8.6
Partnership	5	6.2
Limited Liability Company	68	84
Parastatal	1	1.2
Total	81	100

It was noted as per Table 4.3 that majority of the horticultural exporting firms in Kenya (84%) were owned as limited liability companies. 8.6% of these firms were solely owned as sole proprietorship; ownership through partnership constituted 6.1% while 1.2% owned by a parastatal.

4.4.2 Age of the Horticultural Firms

Information on the years of operation of the FFV horticultural firms in Kenya was considered important because a company's competitive advantage and performance has been assessed to improve with age. In particular to the FFV sector, this study was critical in establishing the firms that managed to be compliant to the European Union's regulation on food and safety standards in 2002 and the eventual adoption of the KenyaGAP in 2007 (Dijk & Trienekens, 2012; Santacoloma & Casey, 2011). In light of food safety regulatory compliance, this study established that 53.4% of firms that are currently in operation were either starting or had already started their operations in 2007. Table 4.4 shows the age of the exporter firms represented in percentage and categorised in the range of firms below 5 years, between 5-10 years, 10-15 years, 15-20, 20-30 and above 30 years was 28.8, 17.8, 21.9, 13.7, 13.7 and 4.1 respectively.

Table 4.4: Number of Years in Operations

Number of Year in Operation	Frequency	Percentage
Less than 5 Years	21	28.8
Between 5-10 Years	13	17.8
Between 10-15 Years	16	21.9
Between 15-20 years	10	13.7
Between 20-30 years	10	13.7
Above 30 years	3	4.1
Total	73	100.0

4.4.3 Nature of Products Exported

The choice of products exported by horticultural exporters are influenced by transactional factors relating to asset specificities and uncertainties. Asset specificity elaborate the length of the crop production cycle, the longer the period the higher the specificity; temporal specificity on the other hand is considered to be low for products with a longer perishability span such as fruits compared to fresh vegetables. While uncertainty would be assessed from the degree or rate of commodity perishability; the degree of specificity in the commodity quality required and the degree of specificity in the timing of harvests and crop deliveries. The choice of either fruits or vegetable exports was thus assessed as a trade-off profitability and the transactional factors of asset and temporal specificity as well as the uncertainties involved.

Table 4.5 show that a majority of the exporters representing 65.9 percent were involved with exports of both fruits and vegetables while exporters who dealt exclusively on vegetable and fruits represented 22.2 and 7.4 percent respectively; 4.9 percent of the exporters exclusively dealt in processing of both or either fruits and vegetables.

Table 4.5: FFV Exporters' Product(s) Preference

Exporters' Product(s) Preference	Frequency	Percentage
Fruits Only	6	7.4
Vegetables Only	18	22.2
Both Fruits and Vegetables	53	65.9
Fruits and Vegetable Processors	4	4.9
Total	81	100

4.4.4 Respondents' Designation

Table 4.6 shows a descriptive analysis by designation of the respondents. 24.7 percent of the respondents were either operations or productions managers while 23.5 percent was representative of respondents in either Quality control or quality assurance level; 16 percent constituted pack-house supervisors. 9.9 percent and 4.9 percent respectively represented C.E.Os and Agronomist type of respondents.

Table 4.6: Respondents Designation

Respondents Designations	Frequency	Percentage
Marketing Managers/Supervisors	17	21.0
Packhouse Supervisors	13	16.0
C.E.O/ M.D	8	9.9
Operations/ Production	20	24.7
Quality Control/Quality Assurance	19	23.5
Agronomists	4	4.9
Total	81	100.0

The research also established that export destinations for Kenyan fresh fruits and vegetables largely remained to be exported to Europe, Middle East and Eastern and South Africa. Specifically to Europe Union; United Kingdom, Netherlands, France, Germany and Sweden remained the largest importers.

4.5 Results on the Contribution on nature of transactions to competitive advantage of FFV exports in Kenya

This section dealt with the factors attributable to nature of transactions and their influence to competitive advantage of the FFV sector; factors such as ownership structure of the sector, nature of the commodity flows in the value chain, competitive capabilities, frequency of exports and the homogeneity or heterogeneity of the markets

that FFV products are exported to. Horticultural production and management of factors of production in Fresh Fruits and vegetables in Kenya revealed as per table 4.7 that, farming activities were largely owned wholly or were partially owned and leased from other farmers respectively at 89.9 and 70.4 percent; this revealed that most of the exporters substituted their crop production from either outsourced farmers or else leased farms for horticultural production.

Critical functions such as identification of subcontracted farmers/farming (84%), managing of customer orders and queries (91.1%) and product grading (88.9) was largely an exclusive function owned largely by the exporters themselves. Owing to the capital outlay in acquisition of modernised pack-houses and insulated transport tracks a large number of exporters outsourced the functions of pack-houses and transport of temperature controlled trucks at 30.9% and 49.4%.

Table 4.7: Ownership and Management of Factors of Production

Nature of Activity	Exclusively Owned %	Exclusively Outsourced %	Both Owned & Outsourced %
Farming Activities	89.9	19.8	70.4
Identification & Subcontracting	84	74	3.7
Managing Customer orders	91.1	5.1	1.3
Grading Products	88.9	8.6	2.5
Pack-house Activities	67.9	30.9	1.2
Insulated Transport	48.1	49.4	1.2

Overall, the research established five ideal models that have been adopted over the years by most horticultural firms that constitute 76.7% of firms operational characteristics; model I consists of firms that operate exclusively to their own pack-houses as well as by having their own farms in addition to operating on leased farms; this model exclusively

outsources specialised transport system, it attracts 23.3% of the firms of whom 12.4% have had their operations for more than 10 years. Model II consists of firms that have operate under model I principles but in addition, they own their logistics, this category of firms constitute 30.1% and have 24.6% of the exporting firms having more than 10 years of experience. Model III and Model IV each have 9.6% share of exporting firms; the uniqueness of Model III is that it operates its own farms as well as by leasing other farms or contracting farmers and growers but outsources both the pack-house and logistics activities; 8.2% of the exporters who are in operation for less than 10 years subscribe to this model. Model IV is essentially an outsourcing model with all factors of production including farming, pack-house activities and logistics are outsourced, it attracts 6.8% of exporting firms that are below 10 years in operations. Model V contrasts model IV by having all factor production being wholly owned without outsourcing, hence farming, pack-house activities and logistics are owned in-house by the exporting firms, this model is witnessed to have 2.7% of the exporting firms of whom are in maturity of between 15 to 30 years of production.

Other than the four models depicted from the horticultural sector operations, this study also established the fresh fruits and vegetables commodity flows by way or charting the actors and paths that routes A-F present themselves as represented in figure 4.1. The main actors in the horticultural value chain are farmers, brokers, and exporters. Farmers could be involved in the value chain independently, in clusters which is typically organized around some lead farmers that are the direct contact with exporters, or in a more collectively organized co-operatives or self-help groups. In most cases, farmers are in direct transaction with exporters, but in some cases, brokers link farmers and exporters as intermediary.

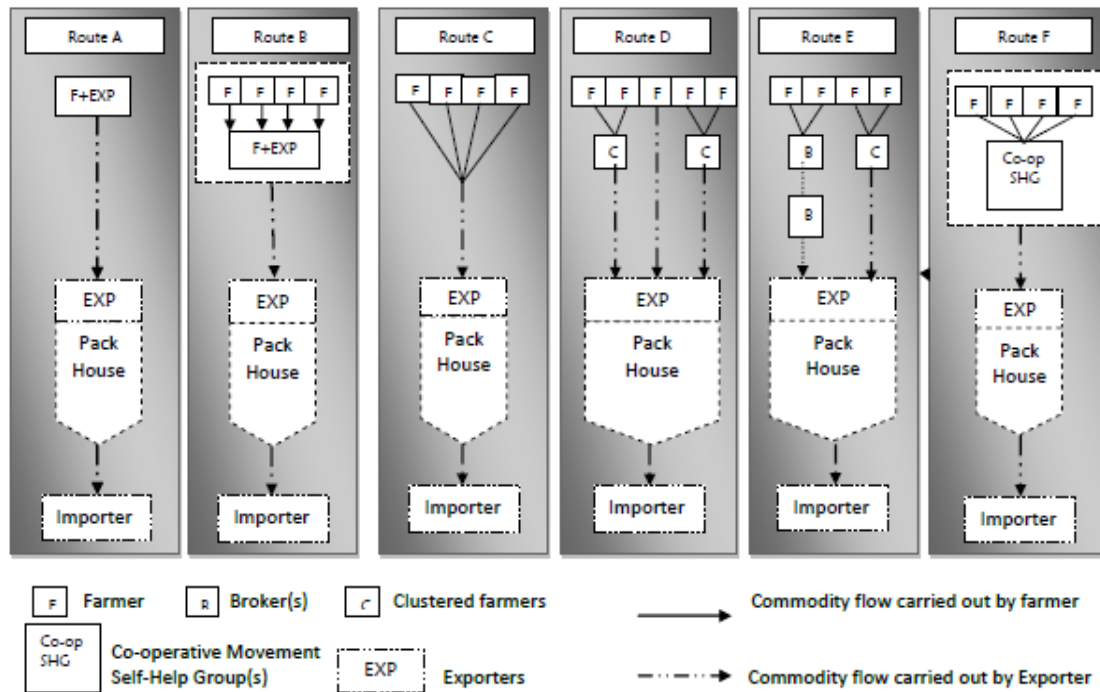


Figure 4.1: Fresh Fruits and Vegetables Commodity flow

Routes A and E have been chartered as routes in fresh fruits value chain where the large scale exporters and medium- and smallholder fruits exporters operate in respectively; Route A is characterised to have a vertically integrated system of production, processing and logistics, which means that large scale exporters own their own farms with full control of the whole process; this route is characteristic of Model V specified above. Route E illustrates transactions involving clustered farmer groups who collectively trade with a given exporter or where small holder farmers sell off their fruits to brokers who upon consolidation of required quantities sell to exporters for further processing and exporting.

Routes B, D and F are witnessed as the dominant routes for fresh vegetables due to the high level of perishability and short lifecycle of the said products. As a result, their coordination compared to the fruits commodity flows is strictly governed directly by the exporters by three means, namely by way of Route B, where the exporter coordinates other farmers or leased farms together with their own farms(s); Route D occurs where exporters establish a contact lead farm in a given cluster groups where coordination of other farmers will be easily done through these lead farmers; and Route F was the route charted by exporters who entered into contractual arrangements with self-help group(s) or co-operative movements that coordinate their collective production of vegetables for various exporters with their larger pool of smallholder farmers; the latter arrangement has helped in collective bargaining of commodity prices.

Route C was cited as a route used by both fresh fruits and vegetable suppliers but uniquely applied during the high production seasons of the year; therefore seasonal farmers as well as exporters find it easy to operate with the intended destinations being mostly the non-EU countries that do not require stringent standards such as the Middle East. In general, the governance mode has shifted from spot market type to more 'captive' types. Route A resembles hierarchy governance suggested by Gereffi et al., (2005) whereas the rest of the routes show characteristics of 'captive' governance, in which the role of exporters has become more important in relation to the coordination and control of the whole chain of local transactions. This demonstrates that there is an increasing trend of asymmetrical power relationships in the local value chain.

From the analysis in Table 4.8 it can be concluded that production and processing capabilities with 78.4 and 77.2 percent formative responses are the most developed in the FFV sector followed by logistics and marketing at 72.5 and 40.8 percent.

Table 4.8: Value Chain Competitive capabilities

Nature of Activity	Affirmed frequency (%)
We have well-co-ordinated extension services	77.5
We promote high productivity	72.5
We employ modern farming practices	85.2
Average Production capability %	78.4
We promote minimum waste in processing	80.0
We have adequate and appropriate storage	81.3
We have modernised packaging unit	70.4
Average processing capability %	77.2
We have organised supply of inputs	92.6
Availability of Specialised Insulated Transport	70.4
We run on technology drive systems	54.3
We have sufficient volumes of air cargo transport	61.3
We are proximate to the freight port	83.8
Average logistics capability %	72.5
We have a preferential agreement with our importers	38.0
We have direct orders from EU supermarkets	82.5
We sell our produce through middle men/women	23.8
We sell our produce through export processing zones	18.8
Average marketing capability %	40.8

The low marketing capability affirms that the sector is largely governed as a captive and only serving key lead firms; as such, the sector has not yet been proactive to seek for new markets other than to serve the already established channels that are largely regulated by the international supermarkets.

As shown in Table 4.9, majority of the exporters export their products twice a week with 37% while others transport weekly and daily as some of the preferred options at 25.9 % and 22.2% respectively. Nature of transactions is articulated partly by the frequency of transaction is related to the number of repetitions of a transaction in a given period of time. Higher frequency of transactions brings familiarity to contractual parties at the interfaces in which human actors in charge of operations interact with one another more often, and hence building personal trust in relationships (Banterle & Stranieri, 2013; Fischer, 2013).

Table 4.9: Frequency of FFV Exports

Frequency of Exports	Frequency	Percentage
Daily	18	22.2
Weekly	21	25.9
Bi-Weekly	30	37.0
Fortnight	10	12.3
Monthly	2	2.4
Total	81	100.0

The choice and decision to export to a given destination is largely governed by the factors of cost and meeting the quality standards of a given market(s). Table 4.10 indicates of two set of exporters who have a preference for homogenous market(s) at 37.5% as a result of manageable operations with destinations such as the EU block which has standards that are largely considered to be homogenous, table 4.10 indicates also of the propensity of exporters to operate with the demands of heterogenous markets (42.5%) that may demand unique and extra standards that vary from other destination markets; this would be cited as the case of Kenyan exporters operating under the EU market standards as well as the UK standards of which in the latter case unique standards such as the British Retail Consortium (BRC) standards may apply other than

the main standards subscribed to by the EU’s food policy regulations. This evidence was corroborated by other scholars with the view that the choice of operating in a heterogenous markets may come with additional constraints in so far as transaction costs are concerned (Ferro, Otsuki, & Wilson, 2015; Henson, Masakure, & Cranfield, 2011; Papadopoulos, Cimon, & Hébert, 2008).

Table 4.10: Categories of Export destination Markets

Export Markets categorization	Frequency	Percentage
One or two destination market(s) that are Homogenous	30	37.5
More than two destination markets with one being heterogenous	34	42.5
more than four destination that are heterogenous	16	20.0
Total	80	100

4.6. Results on the Relationship of Nature of Contract to competitive advantage of FFV exports in Kenya

This section dealt with indicators related to forms of contracts engaged in by the exporters especially with their suppliers; it sought to access the factors that informed FFV exporting firms into contractual agreements with their contracted farmers as well as the facilitative role played by the exporting firms in supporting the contracted firms/farms.

Generally, 92.6% of the FFV exporters contracted FFV farmers in either meeting the demand by exporters by supporting them to meet the short-fall or to supplement their production quantities. Largely also, the predominant contractual arrangement preferred by most FFV actors involves an inclusive arrangement of production and sales type of contract; in this contract arrangement, the exporters *ex ante* agree to engage a given number of FFV farmers to grow the crops exclusively for sale to the specified exporter.

Similar contractual arrangements are as well seen to be adopted by importers to the exporters in that an exporter exclusively prepares a FFV crops to serve a given importer.

Table 4.11 indicate the contractual means through which exporters engage with importers or overseas buyers. The table demonstrates that importers trade with exporters to a large extent with production & sales (79.6%) contract; this contractual arrangement is largely facilitative especially in the *ex post* control and enforcement. While production and sales contracts are dominant, importers are seen not be strictly bound by this form of contract and hence sales contracts are as well witnessed as plausible alternatives but this is largely restrictive to exporters that they may have engaged previously due to the challenges of ascertaining the due diligence of compliance to GAP standards.

Table 4.11: Forms of contractual agreement with Importers

Forms of contractual agreement with Importers	Frequency	Percentage
We engage importers with oral contracts	9	11.1
We engage importers with sales contracts	28	34.6
We engage importers with production & sales contracts	64	79.0
We are integrated with the downstream supplier	8	9.9

Contractual arrangement with farmers are witnessed to be in two forms; namely, contracted farming or leasing of land for farming by exporters. The sector level of contracted farming largely witnesses 64.4% of exporters engaging between 1-10 contracted farmers/farms, 24% of exporters engage between 11-50 farmers/farms. 9% of the exporters' contract more than 51 contracted farmers/farms with the largest exporter engaging more than 70,000 farmers.

While the evidence to contracted farmers/farms is witnessed, the form of contract arrangement is indicated as per Table 4.12 to have 71.6% of the exporters adopting a production and sales contract while 39.5% engage contracted farmers/farms on a sales

contract. 8.6% of the exporters were as well seen to use oral contracts as a form of contract engagement with farmers/farms.

Table 4.12: Forms of contractual agreement with FFV contracted farmers

Forms of contractual agreement with FFV farmers	Frequency	Percentage
We engage oral contracts	7	8.6
We sign sales contracts with farmers	32	39.5
We sign up with the famers a production & sales contracts	58	71.6

The study was also interested to know the extent to which brokers were engaged in the FFV production. The research established that 16% of the exporters engaged brokers in the FFV chains. The modes of engagement under brokers' engagement were linked to exporters signing sales contracts (13.9%) or production & sales contracts (13.9%). Engagement of brokers via oral contracts was characterised to be applicable to 10.1% of the FFV exporters as indicated in Table 4.13.

Table 4.13: Forms of contractual agreement with FFV Brokers

Forms of contractual agreement with FFV Brokers	Frequency	Percentage
We engage oral contracts	8	10.1
We sign sales contracts with Brokers	11	13.9
We sign up with the brokers a production & sales contracts	11	13.9

The choice of a given contractual engagement in agribusiness as Peterson, Wysocki, and Harsh (2001) is generally classified in specification contracting which involves a legally enforceable undertaking specific and detailed conditions of exchange that are specified; through contract specifications *ex ante* conditions of control are laid out or

specified and by an *ex post* arrangement, parties exercise control through monitoring the contract execution. In production and sales mode of contracting, exporters or importers engage the contracted farmers or exporters respectively in the farming of the crop and selling it in total to the exporter or importer. This contractual arrangement seems to work best especially in mitigating *ex post* uncertainties that may arise from scrupulous farmers selling the harvest to other exporters or the farmers being subjected to challenges of market search in the event that the exporters or importers do not meet their part of bargain in buying the crop upon harvesting.

The choice of any given contracting engagement- largely by either oral contracts, sales contracts, production and sales contracts or preference to having either exporters preferring to link themselves with upstream agents such as the contract farmers- is necessitated by other procurement arrangements and relationship that relate to preference by exporters in concentrating in own farm production and minimizing the sourcing from out-growers or ensuring that the out-growers or the small scale farmers have prior certification; taking steps to ensure loyalty of certain growers by providing inputs, advisory services or extended contract periods of supply; reducing the geographical scope to enable tighter controls and reviewing or varying the recommended practises such as in land preparation, irrigation, planting, spraying, record keeping and personal hygiene amongst others (Jaffee, Henson & Rios, 2011).

The summary in Table 4.14 rates factors that exporters consider in sourcing or engaging farms/out- growers. Most exporters are seen to have product quality (79.2%), Production volumes (62.2%) and stability of the growers (30.9%) as the most critical factors appraised as 1st, 2nd and 3rd respectively to the exporters.

Table 4.14: Ranking of factors influencing the choice of contracted farmers by exporters

Factors influencing the choice of contracted farmers by exporters	Frequency	Percentage	Ranking
Product quality	66	79.2	1
Production Volumes	46	62.2	2
Stability of the out-growers	21	30.9	3
Implementation of traceability	16	24.6	4
Cost/price competitiveness	14	23.7	5
Length of time as an out-grower	14	22.6	6
Certification acquired	15	21.4	7
Credit period allowed by out-growers	11	21.2	8

Other factors such as implementation of assurance mechanisms such as traceability (24.6%), cost of the FFV produce (23.7%), length as an out-grower (22.6%), certification(s) acquired (21.4) and the credit period advanced to exporters (21.2%) by the out-growers were ranked as positions 4th , 5th , 6th 7th and 8th respectively. Jaffee, Henson and Rios (2011) prioritised the application of good agricultural practises, ability to meet quality grades, ability to meet sudden changes in orders, ability to maintain required records, post-harvest handling practises and ability to meet food safety controls stands as the performance criteria to choice of out-growers.

4.7. Results on the Relationship of level of chain integration to competitive advantage of FFV exports in Kenya

This section dealt with the indicators attributable to integration in facilitating internal, customer and external collaboration with internal departments and coordination of external linkages such as processing, logistics and customer care as per table 4.15. In

part, the level of integration is related to the effect and impact of decision making to other value chain members such as upstream suppliers and downstream actors and ultimately the consumers.

Table 4.15: Promotion of Internal Integration within the Organisation

Promotion of Internal Integration	Frequency	Percentage
We encourage teamwork through sharing info	77	95.1
We promote efficiency through joint decision making	58	72.5
Regular inter-departmental meetings for forward plans	68	86.1

Table 4.15 indicated that team work (95.1%), joint decisions making (72.5%) and inter-departmental meetings (86.1%) make up for the internal collaborative processes in the FFV sector. Internal integration was this promoted through promotion of synergies within an organisation to promote performance. Such functions involve the collaborative processes in which organisational strategies, practices and processes are harnessed in fulfilling customer requirements.

While upstream suppliers are largely dependent on exporters- and in the case of FFV sector they constitute the farmers who supply the exporters with the raw produce for processing- they mostly adhere to the demands given by the lead firms in order to supply the specified commodities as per the lead firms' expectations. Table 4.16 demonstrated that the relationship between the lead firm/exporter largely resonated to close and frequent contacts, constant feedback from consumers by the exporters/lead firms to the upstream suppliers and sharing of forecasts by the lead firms/exporters for ease of planning by the upstream suppliers.

Table 4.16: Promotion of Customer Integration with Suppliers: Upstream actors

Promotion of Customer Integration with Suppliers	Frequency	Percentage
Close & frequent contact with our suppliers	78	98.7
Promotion of feedback on quality and performance	53	68.8
Share with suppliers our forecast for forward planning	60	75.9
Work with suppliers for quality improvement	43	56.6

On the part of the downstream actors such as importers, table 4.17 demonstrates that the level of integration as per the respondents revolve more in promotion of openness in communication (87.2) and endeared collaborations in promoting quality (81.3); by citing the challenges of geographical dispersion, these attributes are therefore highly appraised as means of raising the levels of integration in the FFV sector; while being duty bound to the importers, respondents opined that sharing of production plans and promotion of corporate relations both being affirmed at 76.3% would promote cordial relations and improve on the integration of the importers and exporter firms.

Table 4.17: Promotion of Customer Integration: Downstream actors

Promotion of Customer Integration Downstream	Frequency	Percentage
We share our production plans with customers	61	76.3
We emphasize openness in communication	68	87.2
We maintain corporate relationships with our customers	61	76.3
We collaborate with our customers in quality matters	65	81.3

While upgrading initiatives such as in product and process upgrading have been achieved with much ease, functional upgrading especially in buyer driven chains is lagging behind. While the levels of chain integration have shown increased collaborative

and functional integration through promotion of programmes such as joint ventures, promotional of cross functional teams and tapping into the benefits of enterprise resource planning, this benefit has a slow uptake due to tight controls regulated by the large retail transnationals (Humphrey & Schmitz, 2002; Lee, Gereffi, & Beauvais, 2012).

Table 4.18 indicates the diminished affirmative frequencies in the efforts akin to promotion of functional integration; the level of involvement in joint ventures (28.4%), product development (34.6%), formation of functional teams (33.3%) and use of ERP platforms (14.8%) are lowly upraised with the respective indicators having less than 50% of responses supporting initiatives within FFV’s sector that would promote technical capacities of sectors viability.

Table 4.18: Programmes Promoting Up/Downstream Integration

Programmes Promoting Up/Downstream Integration	Frequency	Percentage
We engage in joint ventures with our chain actors	23	28.4
We have product development with our chain actors	28	34.6
We promote cross functional teams	27	33.3
We share an Enterprise Resource Planning platform	12	14.8

4.8. Results on the Contribution on Standards and Certification to competitive advantage of FFV exports in Kenya

This section dealt with the factors and indicators attributable to standards and certification and their influence to competitive advantage of the FFV sector; factors such as Good Agricultural Practices (GAPs); various certification bodies that FFV sector operates under; assessment of compliance through regular audits for products and processes and the level of quality assurance to customers and consumers.

Adoption of Good agricultural practises (GAP) as witnessed in Table 4.19 is viewed to be highly appraised as part of the process of enhancing compliance with the market demands. GAP practices are viewed as prerequisites and more relevant to local farming techniques, they thereby promote the elimination of irrelevant control points, lowering compliance costs, and streamlining the certification process for producers and especially for smallholders.

Table 4.19: Application of Good Agricultural Practices (GAPs)

Good Agricultural Practices (GAPs)	Frequency	Percentage
Does your organisation have GAPs in Place	80	98.8
Are GAPs processes documented	79	97.5
Are GAPs audits conducted	78	96.3

Standards and certification schemes sustain their efficacy through inspection of processes and controls that are set in place through a given procedure with the intention of promoting conformance with what is pre-designed against the outcome. Table 4.20 demonstrates that keenness to frequency of inspection is to a greater extent observed weekly at 75.3% of all the respondents.

Table 4.20: Frequency of Inspection

Frequency of Inspection	Frequency	Percentage
Daily	6	7.4
Weekly	61	75.3
Monthly	14	17.3
Total	81	100.0

As shown in Table 4.21, standards related to KenyaGAP, GlobalGAP, HEBI/ETI and BRC are considered to be comprehensive in covering on food safety and sustainability requirements in modern agricultural chains. Other than registration of all horticultural exporters with Horticultural Crops Directorate (98.7%), the KenyanGAP standard that was formed as a parallel to GlobalGAP has largely been considered to be the irreducible minimum standards to subscribe to with 86.4% and 72.8% approval rating from the FFV exporters.

Table 4.21: Certification Bodies subscribed to by FFV Firms

Certification Bodies	Frequency	Percentage
KenyaGAP	70	86.4
GlobalGAP	59	72.8
HEBI/ETI	15	98.7
HCD	82	66.7
BRC	54	24.7

Additional certification such as by British Retail Consortium (BRC) which was subscribed to by 24.7% of FFV exporters is witnessed as an additional competitive strategy sought through product differentiation and value addition (Humphrey, 2006) especially in the export destinations that have heterogenous standard demands.

While the primary the role of these certification schemes remains to deliver consistent output through benchmarked schemes and auditing mechanism (Kalfagianni & Fuchs, 2012); most of the Kenyan FFV exporters are characterised to have at least two certification schemes with a share of 44.6%, FFV exporters with more than three certification schemes consisted of 25.3% as is witnessed in Table 4.22.

The implication of multiple certification schemes to firms that are subscribed to them is the extra cost in maintaining their membership and the cost of third party auditing as demanded of the certifying agencies, this is what has been previously been described as a state of fighting standards with standards or standards legal pluralism (Busch, 2011; Mutersbaugh, 2005; Parlee & Wiber, 2011).

Table 4.22: Min-Max number of Certification Schemes subscribed by FFV Firms

Certification Bodies	Frequency	Percentage
One Certification Scheme	25	30.1
Two Certification Schemes	37	44.6
Above three certification Schemes	21	25.3
Totals	83	100

4.9. Categorical Principal Component Analysis Results

The study used categorical principal component analysis (CATPCA) to reduce the number of indicators/components which did not explain the value chain governance determinants on competitive advantage and retained the indicators which were capable of explaining the value chain governance determinants on competitive advantage. Only factors with component loading values of above 0.4 were used for further analysis; Linting and van der Kooij, (2012) recommended retaining indicators with component loadings of 0.4 and above; Tabachnick and Fidell, (2007) described the factor loadings as follows: 0.32 (poor), 0.45 (fair), 0.55 (good), 0.63 (very good) or 0.71 (excellent).

The research used the Cronbach's alpha to measure the reliability of the data gathered from the field. Cronbach's alpha as a coefficient of reliability gives an unbiased estimate of data generalizability; alpha coefficient of 0.70 or higher indicate that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinion of all respondents in the target population. CATPCA however utilises the Cronbach's alpha

as based on the total dimensions; specific to each dimension, factor loadings of 0.4 and above were retained for the purposes of running regressions.

Apart from the factor loadings criterion, Kaiser Criterion of retaining only dimensions with eigenvalues greater or equivalent to 1 was used. In essence Kaiser criterion elaborates that a factor explains at least as much variance as the equivalent of one variable, otherwise it should be left out (Antonelli & Taurino, 2009; Meulman, Kooij, & Heiser, 2004). The results and interpretation of the factor analysis is presented in the sub-sections that follow for each of the study indicators.

4.9.1. Nature of Transactions

In Table 4.23 the Cronbach's Alpha values for all the indicators before and after extraction with factor loadings value of less than 0.4 were presented. Cronbach's Alpha results in CATPCA was based on the components extracted while the total Cronbach's Alpha as based on the total Eigenvalue of the two dimensions which is 0.864. The result of the output loadings gave two dimensions to the nature of transactions; specific to each dimension, factor loadings of 0.4 and above were retained. The findings revealed that product specificity indicator had a factor loading of less than 0.4; the indicator had loadings of 0.393 and 0.384 to the two component dimensions derived respectively.

The research therefore retained all the indicators on nature of transactions save for the indicator of product specificity as recommended by (Linting & van der Kooij, 2012) that factors with factor loadings of above 0.4 should be retained for further data analysis. Therefore the Cronbach's alpha result for the two dimensions generated from the CATPCA on nature of transaction for dimension 1 (Nature of transaction_1) is 0.711 and dimension 2 (Nature of transaction_2) being 0.417. The Cronbach's values given in these two dimensions relate to the eigenvalues of 2.715 and 1.590 respectively

Table 4.23: Categorical Principal Component Analysis and Reliability of Nature of Transactions

Indicators	Dimension	
	Nature of transaction_1	Nature of transaction_2
Type Business Ownership	0.720	0.122
Product Specificity	0.393	0.384
Countries of Export Categorized	0.675	0.424
Frequency of Export	-0.423	-0.503
Outsourced Factors Production, Processing & Logistics	-0.613	-0.053
Exclusive Agreements with Importers	-0.089	0.699
Direct orders from European Retail	-0.591	0.339
Selling through Middle Merchants	0.599	-0.395
Use of Export Processing Village	0.563	-0.483
		Variance Accounted For
Dimension	Cronbach's Alpha	Total (Eigenvalue)
Nature of Transaction_1	0.711	2.715
Nature of Transaction_2	0.417	1.590
Total	0.864^a	4.305

a. Total Cronbach's Alpha is based on the total Eigenvalue.

This application in CATPCA is further by eigenvalue. To Meulman *et al.* (2004:55) there is a very important relationship between the eigenvalue (the total sum of squared component loadings in each dimension) and the most frequently used coefficient for measuring internal consistence in applied psychometrics such as Cronbach's alpha.

The relationship between α and the total variance accounted for, as expressed in the eigenvalue λ , is expressed in the following formula

$$\alpha = M(\lambda-1)/(M-1)\lambda, (1) \text{-----Equation (7)}$$

where M denotes the number of variables in the analysis. Because λ corresponds to the largest eigenvalue of the correlation matrix, and because CATPCA maximizes the largest eigenvalue of the correlation matrix over transformations of the variables, it follows that CATPCA maximizes Cronbach's alpha as is witnessed in the total Cronbach's α of nature of Transaction being **0.864** with a total eigenvalue of **4.305**.

4.9.2. Nature of Contract

In Table 4.24 the Cronbach's Alpha values for all the indicators before and after extraction with a factor loadings value of less than 0.4 is presented. Cronbach's Alpha results in CATPCA is based on the components extracted while the total Cronbach's Alpha is based on the total eigenvalue of the two dimensions which is 0.885. The result of the output loadings gave two dimensions to the Nature of contract; specific to each dimension, factor loadings of 0.4 and above were retained.

The study revealed that three indicators had factor loading of less than 0.4, the indicators included among them; Importer is part of the downstream actors; we engage supply contract with other suppliers and Brokers are part of our Upstream Suppliers.

Table 4.24: Categorical Principal Component Analysis and Reliability of Nature of Contract

Indicator	Dimension	
	Nature of Contract_1	Nature of Contract_2
Import Oral Contract	-0.420	0.411
Import Sales Contract	-0.540	0.538
Import Production & Sales contract	0.590	-0.413
Importer is an actor Downstream	0.051	-0.172
Supplier Oral Contract	-0.399	0.414
Supplier Sales Contract	-0.488	0.571
Supplier Production & Sales Contract	0.585	-0.241
Contract with other supplier	0.228	-0.030
Brokers engagement	0.593	0.643
Engage Brokers in Oral Contract	0.479	0.512
Engage Brokers in Sales Contract	0.651	0.528
Engage Brokers in Production & Sales contract	0.538	0.627
Broker is part of our Upstream Supplier	0.001	0.022
		Variance Accounted For
Dimension	Cronbach's Alpha	Total (Eigenvalue)
Nature of Contract_1	0.710	2.905
Nature of Contract_2	0.661	2.563
Total	0.885^a	5.467

a. Total Cronbach's Alpha is based on the total Eigenvalue.

The study therefore retained the indicators on nature of contract that with factor loadings of above 0.4 for further data analysis. Therefore the Cronbach's alpha result for the two dimensions generated from the CATPCA on nature of contract for dimension 1 is 0.710 and 2 being 0.661. The Cronbach's values given in these two dimensions relate to the Eigenvalues of 2.905 and 2.563 respectively; the total Cronbach's α of Nature of contract being **0.885** with a total eigenvalue of **5.467**.

4.9.3. Level of Chain Integration

Table 4.25 presents the Cronbach's Alpha values for all the indicators before and after extraction with a factor loadings value of less than 0.4 is presented. Cronbach's Alpha results in CATPCA is based on the components extracted while the total Cronbach's Alpha is based on the total Eigenvalue of the three dimensions which is 0.959. The result of the output loadings gave three dimensions to the level of integration; specific to each dimension a factor loadings of 0.4 and above were retained.

The findings revealed that twelve out of the twenty five indicators had factor loading of less than 0.4 the indicators included We give Feedback to Customer on quality implementation; Changes in exporting destination demands; We engage in out grower coordination; We have a strong departmental Coordination; We Collaborate to Solve problems; We Collaborate to Prevent problems; We share of production plans; we engage in joint ventures; we coordinate through product development; we engage in exchange programmes; we share a common ERP Systems and we coordinate through Export Processing Zones.

The research therefore retained the indicators on level of integration with factor loadings of above 0.4 for further data analysis. Therefore, the Cronbach's alpha result for the three dimensions generated from the CATPCA on level of integration for dimension 1 being 0.838 while dimension 2 and 3 respectively being 0.785 and 0.762. The Cronbach's values given in the three dimensions related to the Eigenvalues of 5.193,

4.101 and 3.751 respectively; the total Cronbach's of Nature of contract being **0.959** with a total eigenvalue of **13.045**.

Table 4.25: Categorical Principal Component Analysis and Reliability on Level of Integration

Indicator	Dimension		
	Level of Integration_1	Level of Integration_2	Level of Integration_1
We have a strong Internal information Sharing	0.351	0.051	0.518
We engage in Joint Management decisions	0.783	-0.225	-0.515
We engage in Interdepartmental Meetings	0.801	-0.219	-0.491
We have Open Door Policy	0.636	-0.170	-0.403
We establish Close Supplier Contact	0.510	0.133	0.802
We share customer Feedback with our Suppliers	0.924	-0.067	0.208
We share our supplier forecast with customers	0.512	0.149	0.802
We involve our supplier in quality inspection	0.782	-0.214	-0.520
We establish close customer contact	0.510	0.134	0.802
We give Feedback to Customer on quality implementation	-0.008	-0.004	0.040
Decision making is communicated to our suppliers & customers	0.072	0.983	-0.242
Changes in exporting destination demands	-0.181	-0.080	-0.059
We engage in out grower coordination	0.182	0.394	0.176
We collaborate with Regulators	0.439	0.228	0.060

Indicator	Dimension		
We have a strong departmental Coordination	0.343	-0.073	-0.216
We Collaborate to Solve problems	0.263	-0.098	-0.258
We Collaborate to Prevent problems	0.335	-0.011	-0.136
We Share our Production Plans	0.197	-0.132	-0.153
We emphasis openess	0.081	0.985	-0.233
We have strong Corporate Relations	0.073	0.793	-0.207
We have Quality Monitoring in place	0.081	0.987	-0.229
We engage in Joint Ventures	-0.069	-0.063	0.233
We coordinate through Product Development	0.275	0.158	-0.020
We engage in Exchange Programmes	0.232	0.158	0.023
We coordinate in Quality Control issues	0.598	-0.069	0.121
We share a common ERP Systems	0.215	0.130	-0.019
We coordinate through Export Processing Zones	-0.076	0.050	-0.311
	Cronbach's	Variance Accounted For	
Dimension	Alpha	Total (Eigenvalue)	
Level of Integration_1	0.838	5.193	
Level of Integration_2	0.785	4.101	
Level of Integration_3	0.762	3.751	
Total	0.959^a	13.045	

a. Total Cronbach's Alpha is based on the total Eigenvalue.

4.9.4. Standards and Certifications

In Table 4.26 the Cronbach's Alpha values for all the indicators before and after extraction with a factor loadings value of less than 0.4 is presented. Cronbach's Alpha results in CATPCA is based on the components extracted while the total Cronbach's Alpha is based on the total Eigenvalue of the two dimensions which is 0.937. The result of the output loadings gave two dimensions to the Standards & Certifications; specific to each dimension, factor loadings of 0.4 and above were retained. The findings revealed that regular checks of processes and products indicator to have a factor loading of less than 0.4, the indicator had loadings of -0.002 and 0.222 to the two component dimensions derived respectively.

Table 4.26: Categorical Principal Component Analysis and Reliability of Standards and Certifications

Indicators	Dimension	
	Standards & Certification_1	Standards & Certification_2
Good Agricultural Practices (GAP) in Place	1.143	-0.182
GAPs audits Conducted	1.143	-0.182
Categories of Standards Place	-0.336	-0.753
Regular Checks of Process and Products	-0.002	0.222
Documented Procedure for recall	0.093	0.696
Conducted Mock recall	0.089	0.771
Products Guarantee to	0.752	0.039
		Variance Accounted For
Dimension	Cronbach's Alpha	Total (Eigenvalue)
Standards & Certification_1	0.814	3.309
Standards & Certification_2	0.505	1.762
Total	0.937 ^a	5.071

a. Total Cronbach's Alpha is based on the total Eigenvalue.

The study therefore retained all the indicators on standards and Certifications save for the indicator of regular checks of processes and products as recommended by (Linting & van der Kooij, 2012) that factors with factor loadings of above 0.4 should be retained for further data analysis. Therefore the Cronbach's alpha result for the two dimensions generated from the CATPCA output for dimension 1 (Standards & Certification_1) is 0.814 and dimension 2 (Standards & Certification_2) being 0.505. The Cronbach's values given in these two dimensions relate to the Eigenvalues of 3.309 and 1.762 respectively; the total Cronbach's α of Standards & Certification being **0.937** with a total eigenvalue of **5.071**.

4.9.5. Competitive Advantage

In Table 4.27 the Cronbach's Alpha values for all the indicators before and after extraction with a factor loadings value of less than 0.4 is presented. Cronbach's Alpha results in CATPCA is based on the components extracted while the total Cronbach's Alpha is based on the total Eigenvalue of the three dimensions which is 0.970. The result of the output loadings gave three dimensions to the level of integration; specific to each dimension a factor loadings of 0.4 and above were retained.

The results as in Table 4.27 revealed that six indicators had factor loading of less than 0.4; the indicators included: We give Product & Process Assurance; Our Processes have Seamless Flows; Produce Juices and Drinks; Target Group Infants; Innovative Management Organization through work responsibilities and Our Products cater to Consumers with Dietary issues. The research therefore retained the indicators on level of integration with factor loadings of above 0.4 for further data analysis.

Therefore, the Cronbach's alpha result for the three dimensions generated from the CATPCA on the dependent variable of competitive advantage for dimension 1 being 0.920 while dimension 2 and 3 respectively being 0.834 and 0.744. The Cronbach's values given in the three dimensions related to the Eigenvalues of 9.864, 5.403 and

3.654 respectively; the total Cronbach's of Nature of contract being **0.970** with a total eigenvalue of **18.921**.

Table 4.27: Categorical Principal Component Analysis and Reliability on Competitive Advantage

Indicators	Dimension		
	Competitive Advantage_1	Competitive Advantage_2	Competitive Advantage_3
We give Product & Process Assurance	0.308	0.357	0.379
We promote Product Identity Preservations	0.284	-0.060	0.493
Our products are natural & Socially Friendly	0.420	0.160	0.570
We can initiate rapid product change	0.410	0.114	0.361
We can easily adjust our production volumes	0.480	-0.012	0.393
We have rapid production mix	0.387	0.190	0.457
We can offer fast Customized Orders	0.497	-0.454	0.234
We are efficient in handling Complaints	0.547	-0.408	0.254
Our Processes have Seamless Flows	0.376	0.041	0.351
We can accurately Locate our products	0.426	-0.011	0.371
Fast Intermodal Transport	0.279	-0.086	0.507
We have an elaborate reverse Logistics	0.514	-0.041	0.493
We prepare Ready to eat products	0.461	0.132	0.191
Our products are Natural & Healthy	0.466	-0.329	-0.078
Our Products cater to Consumers with Dietary issues	0.358	0.028	0.080
We are involved in new Product Variety	0.581	0.198	0.154
Produce Juices and Drinks	0.309	0.215	0.142
Ready to Eat Snacks	0.523	0.077	0.143
Sensory Character Unique taste	0.571	0.036	0.171
Sensory Character texture & Color Appeal	0.546	-0.277	0.074
Sensory Character Product mixes	0.512	0.223	0.163
Target Group Infants	0.291	-0.373	-0.100
Target Group Teens	0.532	-0.599	-0.358
Target Group Adults	0.483	-0.580	-0.202
Target Group Elderly People	0.558	-0.601	-0.324
Information promotion on packaging	0.497	-0.228	-0.120
Information Origin	0.496	-0.528	-0.002

Indicators	Dimension		
	Competitive Advantage_1	Competitive Advantage_2	Competitive Advantage_3
Information labeling	0.504	-0.312	-0.080
New or improved production & Delivery methods	0.455	0.642	-0.252
New or improved production Technique	0.396	0.589	-0.255
New or improved production Equipment	0.642	0.429	-0.195
New or improved production Software	0.456	0.485	-0.209
New Marketing Methods	0.423	0.575	-0.309
New packaging	0.547	0.385	-0.304
New Product placement	0.500	0.407	-0.321
New Product promotion	0.523	0.292	-0.413
New Product pricing	0.362	0.431	-0.296
Innovative Management Organization through work responsibilities	0.394	-0.082	-0.206
Innovative Organization through Knowledge Management	0.661	-0.057	-0.264
Innovative Management Organization through Business Practices	0.650	-0.146	-0.148
Innovative Management Organization through External Relations	0.670	-0.162	-0.184

Dimension	Variance Accounted For	
	Cronbach's Alpha	Total (Eigenvalue)
1	0.920	9.864
2	0.834	5.403
3	0.744	3.654
Total	0.970^a	18.921

a. Total Cronbach's Alpha is based on the total Eigenvalue.

4.10. Univariate Analysis

In this section the study sought to determine whether the global value chain determinants of nature of transactions, nature of contracts, level of chain integration and standards and certification schemes influenced the competitive advantage of the FFV exporting organizations in Kenya through univariate analysis.

4.10.1. Influence of Nature of Transactions on Competitive Advantage

The findings on nature of transactions are presented in the subsequent sections as elaborated from the indicators of business ownership, nature and type of products exported, product specificity, frequency of exports, outsourcing in farming, packaging and transport functions and means of product marketing.

a. Regression analysis of nature of transaction and competitive advantage

Regression analysis to determine the significance relationship of nature of transaction determinant against the competitive advantage of FFV exports was conducted. Table 4.28 shows that the coefficient of determination is 0.048; therefore, about 4.8 percent of the variation in competitive advantage is explained by nature of transaction determinant.

Table 4.28: Model Summary for Nature of Transactions

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.328 ^a	0.048	0.036	0.99195

a. Predictors: (Constant), Nature of Transactions

Table 4.29 presents the results of the Analysis of Variance (ANOVA) on nature of transaction determinant versus competitive advantage. The ANOVA results for regression coefficients indicate that the significance of the F is 0.047 which is less than 0.05. This indicates that the regression model statistically significantly predicts the outcome variable (meaning it is a good fit for the data). There is therefore a significant determinant competitive advantage of Kenya's FFV, $F(1, 82) = 4.072, p < .05, R^2 = .048$. The study findings also relate to Zylbersztajn and Farina (1999) views that the way transaction arrangement are set relate to competitiveness of firms; this is also related

largely to lead firms. As in the FFV sector, the lead firms largely coordinate transactions and production costs in the supply chain.

Table 4.29: ANOVA Analysis for Nature of Transactions

Model ^a		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.007	1	4.007	4.072	.047 ^b
	Residual	74.701	81	0.984		
	Total	83.708	82			

a. Dependent Variable: Competitive Advantage
b. Predictors: (Constant), Nature of Transactions

From table 4.30, the linear regression model for nature of transactions determinant,

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

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ϵ = Standard Error term

β_1 , = Coefficient of Competitive advantage equation

X_1 = Nature of transactions.

Competitive Advantage of Kenya's Fresh Fruits and Vegetable export Sector Y= -0.001-0.219 in nature of transactions. From regression results, a unit decrease in nature of

transaction resulted in a decrease of 21.9% change in competitive advantage of the fresh fruits and vegetable export sector. The general regression model will be specified as:

$$Y = - 0.001 - 0.219X_1.$$

Table 4.30: Coefficients for Nature of Transactions

Model ^a		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-0.001	0.109		-0.008	0.993
	Nature of Transactions	-0.219	0.109	-0.219	-2.018	0.047

a. Dependent Variable: Competitive Advantage

The research sought to determine the beta coefficients of nature of transaction determinant verses the competitive advantage in the export sector. Table 4.30 shows that there was a negative relationship since the coefficient of nature of transactions was -0.219 which is significantly greater than zero. The t statistics (-2.018) was also greater than zero. This demonstrated that the determinant of nature of transactions had negative influence on the competitive advantage. With the significant coefficient value of 0.047 which is less than the p-value of 0.05, the null hypothesis that there is no significant relationship between nature of transaction and competitive advantage in fresh fruit and vegetable exporters in Kenya is rejected. The research therefore accepts the alternative hypothesis that there exists a significant and negative relationship between nature of transaction determinant and competitive advantage in fresh fruit and vegetable exporters in Kenya.

4.10.2. Influence of Nature of Contract on Competitive Advantage

In this section the study sought to determine whether nature of contract determinant influenced the competitive advantage of the FFV exporting organizations in Kenya. The findings on nature of contract are presented in the subsequent sections as elaborated from the indicators of engagement of contract farmers, level of farmers' coordination, forms of contracts applied.

Regression analysis to determine the significance relationship of nature of contract determinant against the competitive advantage of FFV exports was conducted this was based on the two dimensions extracted from the CATPCA in table 4.24. Table 4.31 shows that the coefficient of determination is 0.031; therefore, about 3.1 percent of the variation in competitive advantage is explained by the nature of contract determinants.

Table 4.31: Model Summary for nature of contracts

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.175 ^a	0.031	0.007	1.00704

a. Predictors: (Constant), nature of contracts

Table 4.32 presents the results of the Analysis of Variance (ANOVA) on nature of contract determinants versus competitive advantage. The ANOVA results for regression coefficients indicate that the significance of the F is 0.286 which is more than 0.05. This indicates that the regression model does not statistically predict the outcome variable (meaning it is not a good fit for the data). There is therefore no significant relationship between nature of contract determinants and competitive advantage of Kenya's FFV, $F(1, 82) = 1.271, p > .05, R^2 = .031$.

Table 4.32: ANOVA Analysis for nature of contracts

Model ^a		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.577	1	1.289	1.271	0.286 ^b
	Residual	81.131	81	1.014		
	Total	83.708	82			

a. Dependent Variable: competitive advantage
b. Predictors: (Constant), nature of contract

From table 4.32, the linear regression model for nature of contracts determinant,

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

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ε = Standard Error term

B_2 , = Coefficient of Competitive advantage equation

X_2 = Nature of contracts

Competitive Advantage of Kenya's Fresh Fruits and Vegetable export Sector $Y = -0.001 - 0.168$ in nature of contracts. From regression results, a unit decrease in nature of transaction resulted in a decrease of 16.8% change in competitive advantage of the fresh fruits and vegetable export sector. The general regression model was specified as:

$$Y = -0.001 - 0.168X_2$$

Table 4.33: Coefficients for Nature of Contracts

Model ^a		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-0.001	0.111		-0.007	0.994
	Nature of Contract	-0.168	0.110	-0.168	-1.526	0.131

a. Dependent Variable: Competitive Advantage

The research sought to determine the beta coefficients of nature of contract determinant verses the competitive advantage in the export sector. Table 4.33 shows that there was a negative relationship since the coefficient of nature of contract -0.168 which in this case was not significant and less than zero. The t statistics (-1.526) was also less than zero.

This demonstrated that the dimensions on determinant of nature of contract had no influence on the competitive advantage. With the significant coefficient value of 0.131 which is more than the p-value of 0.05, the null hypothesis that there is no significant relationship between nature of contract and competitive advantage in fresh fruit and vegetable exporters in Kenya is accepted. Broeck and Maertens (2016) largely attribute this trend to the shift from contract farming to labour intensive need for post-harvest handling in pack-houses. The research therefore rejects the alternative hypothesis that there exists a significant relationship between nature of contract determinant and competitive advantage in fresh fruit and vegetable exporters in Kenya.

4.10.3. Influence of Level of Integration on Competitive Advantage

In this section the study sought to determine whether level of integration determinant influenced the competitive advantage of the FFV exporting organizations in Kenya. The findings on level of integration are presented in the subsequent sections as elaborated from the indicators of internal integration, customer integration and external integration.

Regression analysis to determine the significance relationship of level of integration determinant against the competitive advantage of FFV exports was conducted. Table 4.34 shows that the coefficient of determination is 0.193; therefore, about 19.3 percent of the variation in competitive advantage is explained by the level of integration determinant.

Table 4.34: Model Summary for Level of Chain Integration

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.440 ^a	0.193	0.172	0.91913

a. Predictors: (Constant), Level of Chain Integration,

Table 4.35 presents the results of the Analysis of Variance (ANOVA) on level of integration determinant versus competitive advantage. The ANOVA results for regression coefficients indicate that the significance of the F is 0.001 which is less than 0.05. This indicates that the regression model statistically significantly predicts the outcome variable (meaning it is a good fit for the data). There is therefore a significant relationship between level of chain integration determinant and competitive advantage of Kenya's FFV sector, $F(1, 82) = 9.543, p < .05, R^2 = .0193$. Sukati and Hamid (2012) also corroborate the support of supply chain integration and responsiveness promoting competitiveness both in Malaysian manufacturing sector as well as in the food industry through promotion of Halal food integrity (Ali et al., 2013); Otchere, Annan and Anin (2013) also confirmed that internal, external and customer forms of integration also promoted competitive advantage in Ghana's cocoa industry.

Table 4.35: ANOVA Analysis for Level of Chain Integration

		Sum of		Mean		
Model ^a		Squares	df	Square	F	Sig.
1	Regression	16.124	1	8.062	9.543	.000 ^b
	Residual	67.584	80	0.845		
Total		83.708	82			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Level of Chain Integration

From table 4.36, the linear regression model for level of chain integration determinant,

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

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ε = Standard Error term

B_3 , = Coefficient of Competitive advantage equation

X_3 = Level of chain integration

Competitive Advantage of Kenya's Fresh Fruits and Vegetable export Sector
 $Y = -0.006 + 0.397 X_3$ in the level of chain integration. From regression results, a unit increase in level of chain integration resulted in an increase of 39.7% change in

competitive advantage of the fresh fruits and vegetable export sector. The general regression model will be $Y = - 0.006 + 0.397X_3$.

Table 4.36: Coefficients for level of chain integration

Model ^a		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-0.006	0.101		-0.056	0.955
	Level of Chain Integration	0.397	0.101	0.344	3.421	0.001

a. Dependent Variable: Competitive Advantage

The study sought to determine the beta coefficients of level of chain integration determinant verses the competitive advantage in the export sector. Table 4.36 shows that there was positive relationship since the coefficients for level of chain integration was 0.397 which was significantly greater than zero. Their t statistics (3.421) was also greater than zero. This demonstrated that the determinant of level of chain integration had a positive influence on the competitive advantage. With the significant coefficients value of 0.001, the null hypothesis that there is no significant relationship between level of integration and competitive advantage in fresh fruit and vegetable exporters in Kenya is rejected. The research therefore accepts the alternative hypothesis that there exists a significant relationship between level of integration determinant and competitive advantage in fresh fruit and vegetable exporters in Kenya.

4.10.4. Influence of Standards & Certification on Competitive Advantage

Under this variable the study sought to determine whether standards and certifications determinant influenced the competitive advantage of the FFV exporting organizations in Kenya. The findings on standards and certifications are presented in the subsequent

sections as elaborated from the indicators of Good Agricultural Practises (GAPs), GAPs Audits, certification bodies subscribed; Regular checks of processes and products; documented procedures for product recall; conducted mock recalls and guarantee ascertainment. Regression analysis to determine the significance relationship of standards and certifications determinant against the competitive advantage of FFV exports was conducted with the two CATPCA dimensions obtained in Table 4.26. Table 4.37 shows that the coefficient of determination is 0.105; therefore, about 10.5 percent of the variation in competitive advantage is explained by standards and certifications determinant.

Table 4.37: Model Summary for Standards and Certifications

Model ^b	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325 ^a	0.105	0.083	0.96754

a. Predictors: (Constant), Standards and Certifications
b. Dependent Variable: Competitive Advantage

Table 4.38 presents the results of the Analysis of Variance (ANOVA) on standards and certifications determinant versus competitive advantage. The ANOVA results for regression coefficients indicate that the significance of the F is 0.012 which is less than 0.05. This indicates that the regression model statistically significantly predicts the outcome variable (meaning it is a good fit for the data). There is therefore a significant relationship between standards and certifications determinant and competitive advantage of Kenya’s FFV sector, $F(1, 82) = 4.709, p < .05, R^2 = .105$. In inception the introduction of standards and certification schemes were perceived to have a negative effect on Kenya’s competitiveness as correctly attributed by Asfaw, Mithöfer, and Waibel, 2008; Asfaw et al., 2010; Mausch, Mithöfer, Asfaw and Waibel, 2009 as well

as in other regions of the world (García Martínez & Poole, 2004) due to the cost burden in implementing the standards; however the current impact as reported by this study is that the adoption of standards and certification schemes have in the long run promoted both product and process upgrading as well as facilitated competitiveness in the international markets. The latter view has also been corroborated by authors Jaffee & Masakure (2005), Kuwornu & Mustapha (2013) and Tennent & Lockie (2013) respectively in Kenya, Ghana and Vietnam.

Table 4.38: ANOVA Analysis for Standards and Certifications

		Sum of		Mean		
Model ^a		Squares	df	Square	F	Sig.
1	Regression	8.817	1	4.409	4.709	.012 ^b
	Residual	74.890	80	0.936		
	Total	83.708	82			

a. Dependent Variable: Competitive Advantage
b. Predictors: (Constant), Standards & Certifications

From table 4.38, the linear regression model for standards and certification determinant,

$$Y = \beta_0 + \beta_4 X_4 + \varepsilon$$

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ε = Standard Error term

B_4 , = Coefficient of Competitive advantage equation

X_4 = Standards and Certifications

Competitive Advantage of Kenya’s Fresh Fruits and Vegetable export Sector $Y = - 0.008 + 0.239X_4$ in standards and certifications. From regression results, a unit increase in standards and certifications resulted in an increase of 23.9% change in competitive advantage of the fresh fruits and vegetable export sector. The general regression model will be $Y = - 0.008 + 0.239X_4$.

The research sought to determine the beta coefficients of standards and certifications determinant verses the competitive advantage in the export sector. Table 4.39 shows that there was a positive relationship since the coefficient on standards and certification 0.239 which is significantly greater than zero. The t statistics (2.261) were also greater than zero. This demonstrated that the dimension on the determinant of standards & certification had a positive influence on the competitive advantage. With the significant coefficient value of 0.026 which is less than the p-value of 0.05, the null hypothesis that there is no significant relationship between standards & certification and competitive advantage in fresh fruit and vegetable exporters in Kenya is rejected. The research therefore accepts the alternative hypothesis that there exists a significant relationship between standards & certifications determinant and competitive advantage in fresh fruit and vegetable exporters in Kenya.

Table 4.39: Coefficients for Standards and certifications

Model ^a	Unstandardized		Standardized		t	Sig.
	Coefficients		Coefficients			
	B	Std. Error	Beta			
1 (Constant)	-0.008	0.106			-0.073	0.942
Standards & certification	0.239	0.106	0.239		2.261	0.026

a. Dependent Variable: Competitive Advantage

4.11. Correlation Results

The study conducted correlation analysis to test the strength of association/relationship between pairs of research variables (Goodwin & Leech, 2006; Mukaka, 2012). Correlation is the measure of the relationship or association between two continuous numeric variables. Correlation indicates both direction and degree to which they covary with one another from case to case without implying that one is causing the other (Mukaka, 2012).

Correlation analysis results give a correlation coefficient which measures the linear association between two variables. The value of correlation coefficient ranges between -1 and +1. The findings of the study are presented in table 4.40. The results of the correlation analysis for independent variables presented in table 4:40 are based on Spearman's rank correlation coefficients; this analysis as opposed to Pearson's correlation coefficient is based on its robustness when extreme values are suspected in the variables under analysis or when one or both the variables are considered to be skewed or ordinal (Agresti, 2002; Mukaka, 2012; Svensson, 2001).

The results of the correlation analysis presented in table 4:40 show that standards and certification was positively related to nature of transactions ($0.627 < 0.01$) and negatively related to external contingencies ($-0.500 < 0.01$). Nature of transactions was positively related to level of chain integration ($0.189 < 0.05$) and negatively related to external contingencies ($-0.536 < 0.01$) and nature of contract ($-148 < 0.05$); level of chain integration was negatively related to nature of contract ($-0.292 < 0.01$)

Table 4.40: Correlations for Independent Variables (Kendall's tau_b)

		Standards and Quality	Nature of Transactions	Level of Chain Integration	External Contingencies	Nature of Contract
Standards and Certification	Correlation Coefficient	1				
	Sig.(2-tailed)					
	N	83				
Nature of Transactions	Correlation Coefficient	.627**	1			
	Sig.(2-tailed)	.000				
	N	83	83			
Level of Chain Integration	Correlation Coefficient	.053	.189*	1		
	Sig.(2-tailed)	.477	.012			
	N	83	83	83		
External Contingencies	Correlation Coefficient	-.500**	-.536**	-.071	1	
	Sig.(2-tailed)	.000	.000	.343		
	N	83	83	83	83	
Nature of Contract	Correlation Coefficient	.034	-.148*	-.292**	.153*	1
	Sig.(2-tailed)	.645	.048	.000	.041	
	N	83	83	83	83	83

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

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

The results of the correlation analysis presented in table 4:41 are based on Spearman's rank correlation coefficients; this analysis as opposed to Pearson's correlation coefficient is based on its robustness when extreme values are suspected in the variables under analysis or when one or both the variables are considered to be skewed or ordinal (Agresti, 2002; Mukaka, 2012; Svensson, 2001). The results of the correlation analysis in table 4:41 show that standards and certification were positively related to competitive advantage with a Spearman's Correlation Coefficient of $r = 0.304$ and at level of significance of 0.005, was statistically significant as the p-value is less than 0.05; this relationship was classified as low positive.

The findings for nature of transactions was observed to be positively related to competitive advantage with a Spearman's Correlation Coefficient of $r = 0.305$ and at level of significance of 0.005, was statistically significant as the p-value is less than 0.05; this relationship was classified as low positive (Hinkle, William, & Jurs, 2003).

Nature of transaction was found to be positively related to standards and certification with a Spearman's Correlation Coefficient of $r = 0.789$ and at level of significance of 0.001, this was found to be statistically significant as the p-value is less than 0.05; this relationship was classified as high and with a positive correlation.

External contingencies was categorised as negatively related to standards and certifications with a Spearman's Correlation Coefficient of $r = -0.658$ at the significance level of 0.001, which was statistically significant as the p-value is less than 0.05; the relationship was marked as a moderate negative relationship (Hinkle et al., 2003).

Table 4.41: Correlations Matrix for Independent and dependent Variables

		Competitive Advantage	Standards & Certifications	Nature of Transactions	Level of Chain Integration	External Contingencies	Nature of Contract
Competitive Advantage	Correlation Coefficient	1					
	Sig. (2-tailed)						
Standards & Certification	N	83					
	Correlation Coefficient	.304**	1				
Nature of Transactions	Sig. (2-tailed)	0.005					
	N	83	83				
Level of Chain Integration	Correlation Coefficient	.305**	.789**	1			
	Sig. (2-tailed)	0.005	0.000				
External Contingencies	N	83	83	83			
	Correlation Coefficient	0.204	0.073	.250*	1		
Nature of Contract	Sig. (2-tailed)	0.064	0.513	0.023			
	N	83	83	83	83		
Competitive Advantage	Correlation Coefficient	-0.142	-.658**	-.673**	-0.048	1	
	Sig. (2-tailed)	0.199	0.000	0.000	0.666		
Standards & Certification	N	83	83	83	83	83	
	Correlation Coefficient	0.008	0.088	-0.147	-.401**	0.074	1
Nature of Transactions	Sig. (2-tailed)	0.946	0.427	0.185	0.000	0.508	
	N	83	83	83	83	83	83

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

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

Level of chain integration was found to be positively related to nature of transactions with a Spearman's Correlation Coefficient of $r = 0.250$ and at level of significance of 0.023, was statistically significant as the p-value is less than 0.05; this relationship was classified as a negligible correlation.

External contingencies were categorised as negatively related to nature of transactions with a Spearman's Correlation Coefficient of $r = -0.673$ at the significance level of 0.001, which was statistically significant as the p-value is less than 0.05; the relationship was marked as a moderate negative relationship.

Lastly, nature of contract was found to be positively related to level of chain integration with a Spearman's Correlation Coefficient of $r = -0.401$ and at level of significance of 0.001, was statistically significant as the p-value is less than 0.05; this relationship was classified as a low negative correlation.

4.12. Multivariate Regression Results for the contribution of value chain governance Determinants on competitive advantage of FFV Exporters in Kenya

The study carried out regression analysis to determine the relationship between value chain governance determinants and competitive advantage. A second dimension reduction was done to extract dimensions with eigenvalues higher than one as well as variables with factor loadings of 0.4 and above; the variables used for the second and joint CATPCA were based on the variables with factor loading of 0.4 and above in nature of transaction, nature of contract, level of chain integration and Standards & certification as per tables 4.23, 4.24, 4.25 and 4.26 respectively.

From the dimension reduction of the theorized variables, five dimensions were extracted for joint regression analysis as well as moderated multiple regressions as per table 4.42. The first dimension, nature of standards, is composed of Good agricultural practises (GAPs) in place, regular GAP audits, Guarantees given to either the importers, retailers

or to consumers at dinner table, joint management decisions, interdepartmental meetings, sharing of feedback from suppliers and involvement of suppliers in quality inspection.

The second dimension, named as nature of transaction was composed of type of business ownership, categories of countries that products are exported to, marketing arrangement used either through to EU retailers, middle-merchants or selling through export processing villages, conducting mock recall, preference of production and sales contracts by exporters to their upstream suppliers and downstream importers as well as close supplier and customer contacts and shared supplier-customer forecasts while emphasizing openness and external collaboration with regulators. The third dimension, composed of close supplier and customer contacts, strong corporate relations based on shared decision making amongst customers and suppliers, quality monitoring and emphasising on openness, was termed as level of chain integration.

The fourth dimension was named external contingencies based on the strategic reliance on broker type of transactions ranging from loose oral and sales arrangements to production & sales contracts to solicit for export products, these nature of transactions are entered with the exigency of managing both the suppliers and customer by having close contacts and establishing a reliable forecast of suppliers capabilities and customers' demands.

Due to the short product life cycle and standardisation, it makes it easy for brokers with the sector's experience to provide a reliable alternative or contingency plans to exporters for FFV products either in meeting their short-fall or defraying costs associated in buffer/cautionary stocks. The fifth dimension, composed of contract related transactions ranging from importers and suppliers' preference on oral, sales, production & sales type of contracts as well as engagement of brokers in sales and production & sales contracts, this dimension was thus referred to as nature of contract.

Table 4.42: Categorical Principal Component Analysis and Reliability on Joint Value Chain Governance Determinants

Indicators	Dimensions				
	1	2	3	4	5
Business Ownership	-0.143	-0.607	-0.078	0.136	-0.006
Countries of Export Categorized	-0.067	-0.511	0.084	0.166	0.483
Frequency of Exports	0.082	0.207	0.111	0.022	-0.330
Sale by Excl. Agreements with Importers	-0.212	-0.013	0.175	-0.030	-0.070
Marketing through Direct orders to Retailers	0.047	0.467	0.280	-0.350	0.136
Selling through Middle merchants	-0.368	-0.475	-0.093	0.221	-0.104
Marketing through Export Processing Villages	-0.123	-0.472	0.217	0.305	-0.162
Good Agricultural Practices	0.952	-0.332	0.136	0.004	-0.052
Conducted Gaps audits	0.952	-0.331	0.136	0.004	-0.052
Conducted Mock recall	0.162	0.406	0.106	-0.218	0.069
Give guarantee to...	0.523	-0.107	0.108	-0.029	-0.372
Import Oral Contract	0.018	-0.098	0.018	0.209	0.484
Import Sales Contract	0.098	-0.128	0.018	0.242	0.542
Import Production & Sales	0.062	0.415	-0.118	-0.035	-0.666
Supplier Oral Contract	-0.011	-0.145	-0.011	0.225	0.492
Supplier Sales Contract	0.105	-0.227	-0.180	0.243	0.464
Supplier Production & Sales	0.049	0.480	0.111	0.102	-0.551
Brokers engagement	-0.427	-0.269	0.268	0.415	-0.407
Broker contract on Oral Contract	-0.102	-0.328	0.044	0.636	-0.353
Broker contract on Sales Contract	-0.369	-0.062	0.035	0.593	-0.425
Brokers contracts on Production & Sales	-0.075	-0.204	0.162	0.560	-0.405
Internal information Sharing	0.181	0.530	-0.331	0.119	0.138
Joint Management decisions	0.952	-0.332	0.135	0.004	-0.052
Interdepartmental Meetings	0.953	-0.329	0.134	0.003	-0.050
Open Door Policy	0.732	-0.220	0.074	0.016	-0.153
Close Supplier Contact	0.257	0.554	-0.508	0.538	0.106
Feedback to Suppliers Shared	0.861	0.163	-0.266	0.380	0.040
Customer Supplier Forecast	0.257	0.559	-0.505	0.535	0.110
Supplier in quality inspection	0.952	-0.327	0.137	-0.002	-0.050
Close Customer Contact	0.254	0.560	-0.502	0.545	0.096
Decision making communicated to suppliers & Customers	0.015	0.366	0.809	0.280	0.206
Regulator's Collaboration	0.370	0.518	0.099	-0.150	-0.044
Emphasis on Openness	0.033	0.433	0.787	0.279	0.218
Corporate Relations	0.047	0.286	0.621	0.288	0.208
Quality Monitoring	0.016	0.368	0.807	0.279	0.212
Quality Control Coordination	0.501	0.288	-0.224	-0.073	-0.015
Dimension Extracted	Cronbach's Alpha	Variance Accounted For			Total (Eigenvalue)
1. Standards & Certifications	0.888				7.381
2. Nature of Transactions	0.827				5.131
3. Level of chain integration	0.770				3.990
4. External Contingencies	0.714				3.284
5. Nature of Contract	0.710				3.242
Total	0.982 ^a				23.028

a. Total Cronbach's Alpha is based on the total Eigenvalue.

The extracted dimensions of nature of standards, nature of transactions, level of chain integration, external contingencies and nature of contract realized eigenvalues greater than one with sufficient reliability; the total Cronbach alpha for all the dimensions was 0.982 with a total eigenvalue of 23.028. Each of the extracted dimensions had a Cronbach alpha of 0.888, 0.827, 0.770, 0.714 and 0.710 respectively with a variance accounted for by each of the dimensions being 7.381, 5.131, 3.990, 3.284 and 3.242 for each of the extracted dimensions respectively.

4.12.1. Combined Effect Model

In this section, the combined effect of the independent variables to the dependent variable was determined by multiple regression analysis. The independent variables of Standards and certifications, Nature of Transactions, level of chain integration, external contingencies and nature of contract were analysed to determine their effect to the dependent variable of competitive advantage. The findings are presented as per table 4.43.

The results showed that the coefficient of determination was 0.229 which meant that 22.9 percent of variation in competitive advantage is explained by standards and certifications, nature of transactions, Level of chain integration, external contingencies and nature of contract. This implies that a low variation can be explained by the model as presented in table 4:43.

Table 4.43: Model Summary for Competitive Advantage of the FFV Sector in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.478 ^a	0.229	0.178	0.91578

a. Predictors: (Constant), Nature of Transactions, Standards & Certifications, Level of Chain Integration , External Contingencies and Nature of Contracts

The ANOVA results for the regression coefficients in table 4.44 showed that the significance of F statistics is 0.001 which is less than 0.05. This implied that there was a significant relationship between nature of transactions, standards & certifications, level of chain integration, external contingencies and nature of contracts and competitive advantage.

Table 4.44: ANOVA Analysis for competitive advantage of the FFV Sector

Model ^a		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.134	5	3.827	4.563	.001 ^b
	Residual	64.573	77	0.839		
	Total	83.708	82			

a. Dependent Variable: Competitive Advantage
b. Predictors: (Constant), Nature of Transactions, Nature of Contracts, Level of Chain Integration, Standards & Certifications and External Contingencies

From table 4.45, the linear regression model for value chain governance determinants,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ϵ = Standard Error term

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Coefficient of value chain governance determinants on competitive advantage of FFV sector in Kenya equation

X_1 = Nature of transactions

X₂ = Nature of contract

X₃ = level of chain integration

X₄ = Standards and Certifications

X₅ = External contingencies

competitive advantage of Kenya's fresh fruits and vegetable export sector in terms of nature of transactions, $Y = - 0.004 + 0.312 \text{ nature of transactions} + 0.038 \text{ nature of contracts} + 0.210 \text{ level of chain integration} + 0.286 \text{ standards and certifications} - 0.0009 \text{ External contingencies}$.

The general regression model arrived at was $Y = - 0.004 + 0.312X_1 + 0.038 X_2 + 0.210 X_3 + 0.286 X_4 - 0.009X_5$

Regression results show that a unit change in nature of transaction determinant resulted to 31.2% increase in competitive advantage of FFV export sector; unit change in nature of contracts determinant resulted to 3.8% increase in competitive advantage of FFV export sector; unit change in the level of integration determinant resulted to a 21.0% increase in competitive advantage of FFV export sector; unit change in standards and certification determinant resulted to 28.6% increase in competitive advantage of FFV export sector and unit change in external contingencies determinant resulted to a marginal 0.9% decrease in competitive advantage of FFV export sector.

The Beta (β) coefficients values allow us to compare the relative strength in each of the independent variable's relationship with the dependent variable. From table 4:45 nature of transactions determinant X₁ ($\beta=0.312$, $p < 0.05$) had the strongest relationship with the competitive advantage of the fresh fruits and vegetable exporters in Kenya, then followed by the standards & certifications X₄ ($\beta=0.286$, $p < 0.05$) and level of chain integration X₃ ($\beta=0.210$, $p < 0.05$). Nature of contract X₂ ($\beta=0.038$, $p > 0.05$) and

external contingencies X_5 ($\beta=0.009$, $p > 0.05$) could not significantly predict competitive advantage of fresh fruits and vegetable exports sector in Kenya.

The tolerance and Variance Inflation Factor (VIF) analysis was conducted as per table 4:45; to assess for multicollinearity; the logic that if no two independent variables were correlated, then all the VIFs would be 1 was satisfied as per the recommendation in extant literature (O'Brien, 2007).

Table 4.45: Coefficients for competitive advantage of FFV Export Sector

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
	B	Std. Error	Beta	t		Tolerance	VIF
(Constant)	-.004	.101		-.044	.965		
Nature of Transactions	.312	.099	.315	3.150	.002	1.000	1.000
Nature of Contract	.038	.100	.038	.379	.706	1.000	1.000
Level of Chain Integration	.210	.100	.210	2.097	.039	1.000	1.000
Standards and Certifications	.286	.098	.292	2.921	.005	1.000	1.000
External Contingencies	-.009	.100	-.009	-.087	.931	1.000	1.000

a. Dependent Variable: Competitive Advantage

4.12.2. Optimal Effect Model

In this section, an optimal model effect related to the significant independent variables to the dependent variable was determined through multiple regression analysis. The independent variables included as based from table 4:45 were nature of transactions determinant X_1 ($\beta=0.312$, $p < 0.05$), standards & certifications X_4 ($\beta=0.286$, $p < 0.05$) and level of chain integration X_3 ($\beta=0.210$, $p < 0.05$). The latter two variables on Nature of contract X_2 ($\beta=0.038$, $p > 0.05$) and external contingencies X_5 ($\beta=0.009$, $p > 0.05$) which could not significantly predict competitive advantage of fresh fruits and vegetable exports sector in Kenya were excluded. The results from the optimal mode showed that the coefficient of determination was 0.227 which means that 22.7 percent of variation in competitive advantage was explained by standards and certifications, nature of transactions and level of chain integration. This implies that a low variation can be explained by the model as presented in table 4.46.

Table 4.46: Optimal model Summary for significant Value chain Governance Determinants

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.477 ^a	0.227	0.198	0.90498

a. Predictors: (Constant), Nature of Transactions, Standards & Certifications and Level of Chain Integration

The ANOVA results for the regression coefficients in table 4:47 showed that the significance of F statistics is 0.001 which is less than 0.05. This implied that there was a significant relationship between nature of transactions, standards & certifications and level of chain integration and competitive advantage.

Table 4.47: ANOVA Analysis for Optimal Model

Model ^a		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.007	5	3.827	7.736	.000 ^b
	Residual	64.700	79	0.839		
	Total	83.708	82			

a. Dependent Variable: Competitive Advantage
b. Predictors: (Constant), Nature of Transactions, Nature of Contracts and Level of Chain Integration.

From table 4.47, the linear regression model for value chain governance determinants,

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

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ϵ = Standard Error term

$\beta_1, \beta_2, \beta_3,$ = Coefficient of value chain governance determinants on competitive advantage of FFV sector in Kenya equation

X_1 = Nature of transactions

X_2 = Level of chain integration

X_3 = Standards and Certifications

Competitive advantage of Kenya's fresh fruits and vegetable export sector in terms of the model $Y = - 0.004 + 0.313 \text{ nature of transactions} + 0.210 \text{ level of chain integration} + 0.287 \text{ standards and certifications}$.

The general regression model arrived at was $Y = - 0.004 + 0.313 X_1 + 0.210 X_2 + 0.287 X_3$.

Regression results show that a unit change in nature of transaction determinant resulted to 31.3% increase in competitive advantage of FFV export sector; unit change in the level of integration determinant resulted to a 21.0% increase in competitive advantage of FFV export sector and unit change in standards and certification determinant resulted to 28.7% increase in competitive advantage of FFV export sector. The Beta (β) coefficients values allow us to compare the relative strength in each of the independent variable's relationship with the dependent variable. From table 4.48 nature of transactions determinant X_1 ($\beta=0.313$, $p < 0.05$) has the strongest relationship with the competitive advantage of the fresh fruits and vegetable exporters in Kenya, then followed by the standards & certifications X_4 ($\beta=0.287$, $p < 0.05$) and level of chain integration X_3 ($\beta=0.210$, $p < 0.05$).

The tolerance and Variance Inflation Factor (VIF) analysis was conducted as per table 4:48; to assess for multicollinearity; the logic that if no two independent variables were correlated, then all the VIFs would be 1 was satisfied as per the recommendation in extant literature (O'Brien, 2007).

Table 4.48: Coefficients for competitive advantage of FFV Export Sector

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.004	.099		-.044	.966		
Nature of Transactions	.313	.099	.316	3.192	.002	1.000	1.000
Level of Chain Integration	.210	.098	.210	2.120	.037	1.000	1.000
Standards and Certifications	.287	.097	.292	2.956	.004	1.000	1.000

a. Dependent Variable: Competitive Advantage

4.12.2. Influence of Composite value chain governance determinants on Competitive Advantage

Under this composite variable the study sought to determine whether value chain governance determinants in general, influenced the competitive advantage of the FFV exporting organizations in Kenya. The formation of this variable was through the CATPCA of the five determinants on nature of transactions, nature of contracts, level of chain integration, standards & certifications and external contingencies.

The composite variable derived was defined as the composite value chain governance determinant with a Cronbach's alpha, Eigenvalue and percentage variance accounted for being 0.773, 2.620 52.3% respectively. The purpose for this determinant was to ascertain the main research hypothesis that there is no relationship between food value chain governance determinants and competitive advantage of fresh fruits and vegetable exporters in Kenya.

Regression analysis as per Table 4.49 shows the level of significance in the relationship to the composite value chain governance determinant against the competitive advantage of FFV exports; the coefficient of determination is 0.307; therefore, about 30.7 percent of the variation in competitive advantage is explained by value chain governance determinants.

Table 4.49: Model Summary for composite value chain governance determinant

Model ^b	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.306 ^a	0.094	0.083	0.96777

c. Predictors: (Constant), Composite value chain governance determinant
d. Dependent Variable: Competitive Advantage

Table 4.50 presents the results of the Analysis of Variance (ANOVA) on Composite value chain governance determinant versus competitive advantage. The ANOVA results for regression coefficients indicate that the significance of the F is 0.005 which is less than 0.05. This indicates that the regression model statistically significantly predicts the outcome variable (meaning it is a good fit for the data). There is therefore a significant relationship between composite value chain governance determinant and competitive advantage.

Table 4.50: ANOVA Analysis for Composite value chain governance determinant

Model ^a		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.845	1	7.845	8.376	.005 ^b
	Residual	75.862	81	0.937		
	Total	83.708	82			

a. Dependent Variable: Competitive Advantage
b. Predictors: (Constant), Composite value chain governance determinant

From table 4.50, the linear regression model for composite value chain governance determinant,

$$Y = \beta_0 + \beta_c X_c + \varepsilon$$

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ε = Standard Error term

β_c , = Coefficient of Competitive advantage

X_c = Composite value chain governance determinant

Competitive Advantage of Kenya's Fresh Fruits and Vegetable export Sector
 $Y = - 0.002 + 0.307 X_c$ in the composite value chain governance determinant. From regression results, a unit increase in the composite value chain governance determinant resulted in an increase of 30.7% change in competitive advantage of the fresh fruits and vegetable export sector. The general regression model will be $Y = - 0.002 + 0.307 X_c$.

The study sought to determine the beta coefficients of Composite value chain governance determinant verses the competitive advantage in the export sector. Table 4.51 shows that there was a positive relationship since the coefficient on composite value chain governance determinant 0.307 which is significantly greater than zero.

The t-statistics (2.894) were also greater than zero. This demonstrated that the composite value chain governance determinant dimension had a positive influence on the competitive advantage. With the significant coefficient value of 0.307 which is less than the p-value of 0.05, the null hypothesis that there is no significant relationship between

value chain governance determinants and competitive advantage in fresh fruit and vegetable exporters in Kenya is rejected. The research therefore accepts the alternative hypothesis that there exists a significant relationship between value chain governance determinants and competitive advantage in fresh fruit and vegetable exporters in Kenya.

Table 4.51: Coefficients for Composite value chain governance determinant

Model ^a	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	-0.002	0.106		-0.017	0.987
Composite VCG determinant	0.307	0.106	0.306	2.894	0.005

a. Dependent Variable: Competitive Advantage

Deriving from the summary from table 4:45, table 4.52 gave a summary of the study's hypotheses test results. Based on the hypotheses analysis the study accepted the decision that there is no relationship between nature of transactions, level of chain integration and standards & certifications determinants while rejecting that the decision that there is no relationship between nature of contract and external contingencies determinants to competitive advantage of fresh fruits and vegetable exporters in Kenya.

Table 4.52: Summary of Hypotheses Test Results

Hypotheses	P-Value	Decision
H₀₁: There is no relationship between nature of transaction and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.002	Accepted
H₀₂: There is no relationship between nature of contract and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.706	Rejected
H₀₃: There is no relationship between the level of chain integration and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.039	Accepted
H₀₄: There is no relationship between standards and certifications and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.005	Accepted
H₀₅: There is no relationship between food value chain governance determinants and competitive advantage of fresh fruits and vegetable exporters in Kenya	0.005	Accepted

4.13. Moderated Multiple Regression Analysis

In this section, the study sought to determine the moderating effect of traceability systems on value chain governance determinants and competitive advantage in order to test the moderating variable hypothesis (H₀₅) that states that there is no relationship between moderating effect of traceability systems on the relationship between food value chain governance determinants and competitive advantage of fresh fruit and vegetable exporters in Kenya. The findings are presented as per table 4.53 with the discussion of the moderating variable and the determination of the moderating effect.

Adoption of traceability from the study by the FFV sector was absolutely affirmed by 98 percent of the exporters, it was noted that only two exporters did not adopt traceability systems; to these two exporters, their export market was not aimed for Europe but rather the Middle East where the traceability requirements are not mandatory. While traceability was overwhelmingly adopted, the sector's traceability system used was paper based that was adopted by 72 percent of the firms; firms that adopted both the electronic and paper based traceability were 21 percent while those who exclusively adopted electronic traceability were 5 percent.

Largely, the sector's goal in adoption of traceability system(s) is affirmed by 93 percent of the exporters to promote supply chain efficiency, 89 percent of firms also confirmed that traceability improved quality. Other key goals for adopting traceability were supported by 83 percent for the exporters to manage product recall as well as 72 percent for providing evidence against liability claims. A number of advantages were cited but exporters namely that traceability promoted fast and accurate information, promoted compliance to food laws, reduction of uncertainty as well to abate counterfeit.

Asked of strategic aims of traceability, horticultural exporters supported the use of traceability systems as means of accounting for origin of products, making decisions on contracted farmers and promoting trust by changing from long to short contracts; these responses were affirmed by 94, 93 and 60 percent of the exporters respectively.

In the assessment of the moderating effect to each of the value chain governance determinants, the study first regressed with the dependent variable in a standard linear regression. Thereafter, each equation was re-estimated including: the moderator variable and adding the cross product of the independent and moderator variable as per equations 5 and 6. Changes in R^2 (ΔR^2) were assessed to determine if there were significant increases when the cross product (X.Z) entered into the regression equation; this provided an indication of the influence of the moderating variable. The summary of the interaction effects as well as the summary of moderated hypotheses test results are

summarised as per tables 4.53 and 4.54 respectively.

Table 4:53 Moderated Multiple Regression Results

Determinant(s)	Variables	β	R ²	ΔR^2	Sig. F Change
Nature of Transaction Model I	(Constant)	0.545	0.134	0.038	0.003
	Traceability Mode	-0.429			
	Nature of Transactions	0.312			
	(Constant)	0.553	0.171		
	Traceability Mode	-0.438			
Nature of Contract Model II	Nature of Transactions	-0.235	0.046	0.003	0.149
	Interaction Variable (Nature of Transaction x Traceability mode)	0.424			
	(Constant)	0.641			
	Traceability Mode	-0.504	0.050		
	Nature of Contract	0.115			
Level of Chain Integration Model III	(Constant)	0.675	0.092	0.050	0.606
	Traceability Mode	-0.546			
	Nature of Contract	-0.056			
	Interaction Variable (Nature of Contract x Traceability mode)	0.131			
	(Constant)	0.635	0.141		
Standards & Certification Model IV	Level of Chain Integration	0.242	0.112	0.039	0.008
	Traceability Mode	-0.498			
	(Constant)	0.612			
	Level of Chain Integration	-0.559	0.151		
	Traceability Mode	-0.506			
External Contingencies Model V	Interaction Variable (Level Chain Integration x Traceability mode)	0.480	0.036	0.003	0.231
	(Constant)	0.476			
	Traceability Mode	-0.376			
	Standards and Certifications	0.274	0.039		
	(Constant)	0.330	0.061*		
External Contingencies Model V	Traceability Mode	-0.228	0.039	0.003	0.619
	Standards and Certifications	-1.200			
	Interaction Variable (Standards & Certifications x traceability mode)	1.448			
	(Constant)	0.544			
	Traceability Mode	-0.428			
External Contingencies Model V	External Contingencies	-0.037	0.036	0.003	0.231
	(Constant)	0.536			
	Traceability Mode	-0.417			
	External Contingencies	-0.195	0.039		
	Interaction Variable (External Contingencies x Traceability Mode)	0.114			

a. Dependent Variable: Competitive Advantage

*significant at the 0.1 level

**significant at the 0.05 level

Model I: with nature of transactions as a determinant of value chain governance and independent variable, traceability systems were found to have an important interaction effect between nature of transactions and competitive advantage ($\beta = 0.553$; $\Delta R^2 0.038$; $p < 0.10$), indicating that traceability system(s) is a significant moderator with a negative effect to competitive advantage. In Model II: no significant interaction was evident ($\beta = 0.675$; $\Delta R^2 0.003$; $p > 0.1$) between nature of contracts as a determinant of value chain governance.

In Model III the level of chain integration as a determinant of value chain governance to traceability systems as a moderating variable was found to have an important interaction effect between level of chain integration and competitive advantage ($\beta = 0.612$; $\Delta R^2 0.141$; $p < 0.05$), indicating that traceability system(s) is a significant moderating effect although with a negative effect to competitive advantage.

In Model IV, Standards and certifications as a determinant of value chain governance and traceability systems were found to have an interaction effect to competitive advantage ($\beta = 0.551$; $\Delta R^2 0.039$; $p < 0.10$). External contingencies as a determinant of value chain governance and independent variable under Model V, had no significant interaction to competitive advantage ($\beta = 0.536$; $\Delta R^2 0.003$; $p > 0.1$).

The combined effect of the independent variables plus the moderating variable to the dependent variable was determined by multiple regression analysis as indicated in table 4.54. The independent variables of standards and certifications, nature of transactions, level of chain integration, external contingencies and nature of contract plus the moderating variable (Traceability Systems) were analysed to determine their effect to the dependent variable of competitive advantage.

From table 4.54, the linear regression model for value chain governance determinants plus the moderating variable,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where;

Y = Competitive Advantage of Kenya's FFV Sector

β_0 = Constant (Y- Intercept)

ε = Standard Error term

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = Coefficient of value chain governance determinants plus moderator variable on competitive advantage of FFV sector in Kenya equation

X_1 = Nature of transactions

X_2 = Nature of contract

X_3 = level of chain integration

X_4 = Standards and Certifications

X_5 = External contingencies

X_6 = Traceability Systems

The Beta (β) coefficients values allow us to compare the relative strength in each of the independent variables plus moderating variable's relationship with the dependent variable. From table 4:54 under Model VII, nature of transactions' determinant X_1 ($\beta=0.316$, $p < 0.05$) had the strongest positive relationship with the competitive advantage.

Under the same model VII as per table 4.54, standards & certifications X_4 ($\beta=0.269$, $p < 0.05$) and level of chain integration X_3 ($\beta=0.249$, $p < 0.05$) had also a positive interaction. Nature of contract X_2 ($\beta=0.123$, $p > 0.05$) External contingencies X_5

($\beta=0.039$, $p > 0.05$) could not significantly predict competitive advantage of fresh fruits and vegetable exports sector in Kenya; the moderator variable X_6 ($\beta= -0.572$, $p < 0.05$) had a strong but negative relationship with the competitive advantage of the fresh fruits and vegetable exporters in Kenya.

Competitive advantage of Kenya's fresh fruits and vegetable export sector in terms of nature of transactions, $Y = - 0.004 + 0.312$ nature of transactions + 0.038 nature of contracts + 0.210 level of chain integration + 0.286 standards and certifications – 0.0009 External contingencies and Traceability Systems -0.575 .

Table 4:54 Multiple Regression with Independent & Moderating Variables

Determinant(s)	Variables	β	Sig.	R ²	ΔR^2	Sig. F Change
Multiple Linear	(Constant)	-0.004	0.965	0.229		0.001
	Nature of Transactions	0.312	0.002**			
Without moderating Variable	Nature of Contract	0.038	0.706			
	Level of Chain Integration	0.210	0.039**			
	Standards & Certifications	0.286	0.005**			
Model VI	External Contingencies	-0.009	0.931	0.284	0.056	0.018**
Multiple Linear	(Constant)	0.729	0.024**			
With moderating Variable	Nature of Transactions	0.316	0.002**			
	Nature of Contract	0.123	0.236			
	Level of Chain Integration	0.249	0.014**			
Model VII	Standards & Certifications	0.269	0.006**			
	External Contingencies	-0.039	0.690			
	Traceability Systems	-0.575	0.018**			

a. Dependent Variable: Competitive Advantage
 **significant at the 0.05 level

The general combined regression model plus the moderator variable to the dependent variable arrived at was: $Y = 0.729 + 0.0316X_1 + 0.123X_2 + 0.249X_3 + 0.269X_4 -$

$0.039X_5 - 0.575X_6$.

Model VI under the multiple moderated regression in Table 4:51 corroborates the Beta (β) coefficients values as per Table 4:45 in the multiple regression without the moderating variable of traceability systems. With the inclusion of the moderator variable into the multiple regression the interaction effect is realised as per Model VII.

Model VII indicates the analysis of nature of transactions, Nature of contract, Level of chain integration, Standards and Certifications and External contingencies as determinants of value chain governance and independent variables combined with traceability systems are found to have an important interaction effect with the dependent variable of competitive advantage ($\beta = 0.729$; $\Delta R^2 0.056$; $p < 0.005$), indicating that traceability system(s) is a significant moderator with a negative effect to competitive advantage.

Deriving from the general hypothesis in this study that there is no relationship between moderating effect of traceability systems to the relationship between food value chain governance determinants and competitive advantage of Kenya's FFV, the summary from table 4.55 gave the study's hypotheses test results with the moderating effect.

Based on the hypotheses analysis and consistently to table 4.52 the study accepted the decision that there is no relationship between nature of transactions, level of chain integration and standards & certifications determinants while rejecting that the decision that there is no relationship between nature of contract determinant to competitive advantage of fresh fruits and vegetable exporters in Kenya.

Table 4.55: Summary of Moderated Hypotheses Test Results

Frequency of Exports	P-Value	ΔR^2	Decision
H_{05a}: There is no relationship between traceability systems and the relationship between nature of transaction and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.062*	0.038	Accepted
H_{05b}: There is no relationship between traceability systems and the relationship between nature of contract and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.606	0.003	Rejected
H_{05c}: There is no relationship between traceability systems and the relationship between level of chain integration and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.035**	0.050	Accepted
H_{05d}: There is no relationship between traceability systems and the relationship between standards and certifications and competitive advantage of fresh fruits and vegetable exporters in Kenya.	0.061*	0.039	Accepted

*significant at the 0.1 level; **significant at the 0.05 level

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

In this chapter, the summary of findings, conclusions and recommendations are presented based on the findings as related to the purpose of the study which was set out to assess the relationship between food value chain governance determinants and their relationship to competitive advantage of fresh fruits vegetable exporters in Kenya. The chapter further summarises and gives suggestions and recommendations for further research in supply chain management and global value chains' scholarship. The recommendations will help the industry players on how they can improve their competitive advantage in the horticultural sector in Kenya and the international front.

5.2. Summary of the Findings

The study sought to assess value chain governance determinants and their contributions to competitive advantage of Fresh Fruits and vegetable exporters in Kenya. The specific objectives of the study were to investigate the determinants of nature of transaction to competitive advantage of fresh fruits and vegetable sector in Kenya; nature of contracts to competitive advantage of fresh fruits and vegetable sector in Kenya; level of chain integration to competitive advantage of fresh fruits and vegetable sector in Kenya; and standards & certifications to competitive advantage of fresh fruits and vegetable sector in Kenya. The outcomes of the findings can be summarised based on the following research objectives.

5.2.1. Nature of Transactions and Competitive advantage of Fresh Fruits and Vegetable Sector in Kenya

The results indicate that the determinant on nature of transactions significantly contributes to the competitive advantage of fresh fruits and vegetable horticultural sector in Kenya. This is shown by the regression analysis value $F(1, 82) = 4.072, p < .05, R^2 = .048$. Correlation analysis revealed that nature of transactions was positively related to competitive advantage of fresh fruits and vegetable exporters in Kenya ($r = 0.305, p < 0.005$) was statistically significant as the p-value is less than 0.05; this relationship was classified as low positive.

5.2.2. Nature of Contract and Competitive advantage of Fresh Fruits and Vegetable Sector in Kenya

The results indicate that the determinant on nature of contracts does not significantly contribute to the competitive advantage of fresh fruits and vegetable horticultural sector in Kenya. This is shown by the regression analysis value $F(1, 82) = 1.271, p > .05, R^2 = .031$. The correlation analysis revealed that nature of contracts was not related to competitive advantage of fresh fruits and vegetable exporters in Kenya ($r = 0.008, p > 0.946$) was statistically not significant as the p-value is greater than 0.05.

This is despite the higher engagement of out-growers by exporters which indicated that 93 percent of the export companies were directly or indirectly involved. The failure in part of the nature contract to be of significance to FFV sector competitiveness is attributable to constant supply systems re-orientation constantly passing from through the redesign of specific contractual arrangements.

5.2.3. Level of Chain Integration and Competitive advantage of Fresh Fruits and Vegetable Sector in Kenya

The results indicate that the determinant on level of chain integration significantly contributes to the competitive advantage of fresh fruits and vegetable horticultural sector in Kenya. This is shown by the regression analysis value $F(1, 82) = 9.543, p < .05, R^2 = .0193$.

Internal integration promoted through internal information sharing, joint decision making and interdepartmental meetings were supported with 94, 82 and 74 percent respectively of all the exporters. Customer integration was largely promoted by information related channels such as close supplier contact which constituted 92 percent support by the exporters; sharing of customer feedback with suppliers as well as sharing supplier forecast information with customers along the value chain was seen to have support by 67 and 75 percent of the findings garnered from the exporters respectively. External integration was as well supported largely on the aim of maintaining corporate relations especially in quality management areas and information sharing. Information sharing was characterised by close supplier contact, feedback to customers on quality implementation and regular communication of decisions arrived at with suppliers or with customers. While the study also sought for other forms of external integration involved, the results revealed that joint venture initiatives, coordination through and exchange programmes were not popular, these three areas were rated at 29, 24 and 33 percent respectively.

5.2.4. Standards and Certifications and Competitive advantage of Fresh Fruits and Vegetable Sector in Kenya

The results indicate that the determinant on standards & certifications significantly contributes to the competitive advantage of fresh fruits and vegetable horticultural sector in Kenya. This is shown by the regression analysis value $F(1, 82) = 4.709, p < .05, R^2 =$

.105. Correlation analysis revealed that standards & certifications were positively related to competitive advantage of fresh fruits and vegetable exporters in Kenya ($r = 0.305$, $p < 0.005$) was statistically significant as the p-value is less than 0.05; this relationship was classified as low positive.

The essence of international competitiveness to most horticultural exporting firms is compliance to Good Agricultural Practises (GAPs) as the irreducible minimum. This was affirmed by the compliance levels to GAPs practises and GAP audits was reported to absolute levels of 97 and 95 percent respectively. Whereas most horticultural exporters in Kenya have been registered to at least two certification bodies indicating an increased auditing costs accrued from distinct certification audits, the same has promoted competitiveness in the horticultural sector especially in exports to heterogeneous markets that subscribe to multiple standards conventions.

5.2.5. External Contingencies and Competitive advantage of Fresh Fruits and Vegetable Sector in Kenya

This determinant was realised as the fourth dimension of the second CATPCA output dimension based on table 4.41. The fourth dimension was named external contingencies upon relating the factors associated to them being reliant on broker type of transaction ranging from loose oral and sales arrangements to production & sales contracts to solicit for export products. These attributes are alluded to in literature and are characteristic traits to contracts that are largely influenced by a network/relational forms of governance and is as well driven by short product life cycles in sectors such as in agriculture; it thus makes it easy for brokers with the horticultural sector's experience to provide a reliable alternative or contingency plans to exporters for FFV products largely based on trust. These contingency plans a largely conducted to meet exporters' short-fall or help in defraying costs associated in buffer/cautionary stocks. These transactions are thus entered into by exporters with the exigency of managing both the suppliers and

customer through having close contacts and establishing a reliable forecast of suppliers capabilities and customers' demands.

The results however indicate that the determinant on external contingencies did not contribute to the competitive advantage of fresh fruits and vegetable horticultural sector in Kenya. This is shown by the regression analysis value $F(1, 82) = 4.709, p > .05, R^2 = .105$. Correlation analysis revealed that standards & certifications were positively related to competitive advantage of fresh fruits and vegetable exporters in Kenya ($r = -0.0142, p > 0.199$) was not statistically significant as the p-value was higher than 0.05.

5.2.6. Traceability Systems in the Relationship between value chain governance and Competitive advantage of Fresh Fruits and Vegetable Sector in Kenya

Adoption of traceability by the FFV sector was affirmed by 98 percent of the exporters, it was noted that only two exporters did not adopt traceability and traceability systems; to these two exporters their export market were not aimed for Europe but rather the Middle East countries where the traceability requirements are not mandatory. While traceability was overwhelmingly adopted, the sector's traceability system used was paper based that was adopted by 72 percent of the firms; firms that adopted both the electronic and paper based traceability were 21 percent while those who exclusively adopted electronic traceability were 5 percent.

Largely, the sector's goal in adoption of traceability was affirmed by 93 percent of the exporters to promote supply chain efficiency, 89 percent of firms also confirmed that traceability improved quality. Other key goals for adopting traceability were supported by 83 percent for the exporters to manage product recall as well as 72 percent for providing evidence against liability claims. A number of advantages were cited but exporters namely that traceability promoted fast and accurate information, promoted compliance to food laws, reduction of uncertainty as well to abate counterfeit.

Moderation effect of traceability systems was affirmed by interactions on nature of transactions, level of chain integration and standards & certifications; moderation effect of traceability systems was not ascertained in the determinants of nature of contracts and external contingencies.

5.3. Conclusion

The study findings showed that export oriented horticultural sector is influenced by nature of transactions, nature of contracts, level of chain integration, standards & certifications and external contingencies as the main value chain governance determinants. Significantly, largest influencers of these determinants to competitiveness of the sector related to nature of transaction, level of supply chain integration and standards & certifications this was supported by the regression analysis findings with $F(5, 82) = 4.563, p < 0.5, R^2 = 0.229$.

The descriptive analysis further revealed that nature of transactions determinant ($\beta=0.312, p < 0.05$) has the strongest relationship with the competitive advantage of the fresh fruits and vegetable exporters in Kenya, then followed by the standards & certifications ($\beta=0.286, p < 0.05$) and level of chain integration ($\beta=0.210, p < 0.05$). Nature of contract X_2 ($\beta=0.038, p > 0.05$) and external contingencies X_5 ($\beta=0.009, p > 0.05$) could not significantly predict competitive advantage of fresh fruits and vegetable exports sector in Kenya.

5.4. Recommendations Based on the Research

The study empirically justifies the value chain governance determinants as proposed in GVC literature; the research therefore corroborates the findings that nature of transactions, nature of contracts, level of chain integration, standards & certifications and external contingencies as the main value chain governance determinants affecting the horticultural sector FFV exports. Significance of nature of transactions, level of

chain integration, standards & certifications determinants to competitive advantage was ascertained.

5.4.1. Managerial Recommendations

Based on GVC literature, governance determinants have largely been categorised broadly under nature transactions with determinants of complexity of transactions, ability to codify transactions, capability of the supply base and degree of coordination & power asymmetry complexity of transactions, frequency of transactions; however besides these factors, this study establishes the primacy of standards and certifications as a critical governance determinant. The influence and proliferation of standards & certifications in the export oriented horticultural value chains requires the sector and its stakeholders attention by prioritising it and its effect to the smallholder farmers/out grower who is heavily relied upon (Henson, Jaffee, & Masakure, 2013; Mausch et al., 2009) in tending to the export oriented horticultural crop in the sector in order to constantly meet the demands enshrined in these food regulations.

Even though the adoption of traceability was overwhelmingly affirmed and practised, there requires much more effort to have the adoption also take-up electronic traceability system for visibility along the value chain; this facilitation will make data to be accessed easily as well as allowing for more data filters that would promote efficient and prompt decisions making; this improvement is corroborated by the moderating effect of traceability to standards and certifications, nature of transactions as well as level of chain integration determinants.

With the emergent determinant on external contingencies, the sector needs to properly document its contingency plans owing to the short product life cycle; some of the plans relate to documenting product recall procedures and demonstration of mock recalls, exporters need to be create robust systems for in managing exigencies in customer demands, product and process exigencies. Extant literature indicates that contingencies

are largely pronounced in contract formulations where it is evident that a contract cannot in *ex ante* anticipate all the uncertainties and behavioural opportunism; the approaches in the horticultural sector used to manage such contingencies other than planning is the development of relational forms of governance that are largely based on trust.

5.4.2. Policy Recommendations

The draft policy on horticulture that was developed in 2012 that formed the basis of this study can benefit from the following recommendations that it had posed; in part, this study informs this policy by documenting that; first, this study offers a research reference that embraced the value chain approach which has demonstrated that FFV sector has had high quality products, improved product development and marketing. Second, the research informs the draft policy through the dedicated section on effect traceability systems as an important component of export oriented trade. The research informs that interventions through stakeholders involvement have ensured that traceability mechanisms are in place and operational.

Thirdly, under the legal and institutional framework, the National Policy recognized the current legal and regulatory frameworks that governed the industry were established by the Kenyan parliament and subsidiary legislations. The research in the horticultural sector firms-up that the sector is influenced heavily by international standards, protocols, conventions, treaties. This study was particularly concerned with the way the legislations had influenced the FFV horticultural sector in so far as food value governance was concerned and in the way the legislations continued to affect the smallholder farmers in meeting the demands enshrined in these food regulations; this study thus confirms the central role of standards and certifications in the export oriented horticulture. Fourth, the policy noted that Kenya's exports were largely in semi-processed and low value produce which accounted for 91 percent of total agricultural related exports. The potential in value addition has been amplified in this study to the extent that value addition especially with the adoption of modern pack-houses has

enabled the sector to take charge of downstream activities such as packaging, sorting, and cold chain facilities that have greatly improved the value of the exports made through differentiating strategy; this study seconds the view that the current revenue generated could be doubled without a considerable increase in volume of exports simply by optimising the downstream activities that are currently being conducted by the exporters though were previously conducted by the importers and retailers in the countries of destinations.

5.4.3. Theoretical and Empirical Implications

Theoretically, global value chains are configured around concepts & activities, decisions and implications. This study theoretically feeds into the configuration of governance decision and performance implications under competitiveness. The research also adds to the body of knowledge on sectoral value chains specifically the horticultural sector or largely the agricultural value chains.

Overall, despite the rich scholarship in GVC research the dependence of its insights have largely been based on in-depth case studies including garments, footwear, electronics and horticulture; the call for empirical testing by scholars was in this study seconded and corroborated; this study sought to fill on this existing knowledge gap by optimising on empirical assessment through the exploratory approach of identifying the critical value chain governance determinants.

5.5. Areas for Further Research

While the potential in value addition can greatly improve the value of the exports made through differentiation strategies, value addition through erecting more cold chain facilities and pack-houses in order to meet this growing demand has not been well researched. The demand by major importers such as European supermarkets and retail supply chains have over the years gradually demanded for packaging and processing

considerable amounts of the exported fruits and vegetables; further research is called upon to empirically document the role that pack-houses have in the horticultural value chain and products' value addition. The research may be tailored to pack-house activities and their role in value addition of the horticultural products and also mapping out the logistics and distribution networks of both the horticultural produce suppliers and their link with the exporters via the pack-houses as a central processing unit.

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APPENDICES

Appendix I: Questionnaire

To Fresh Fruits and Vegetables Exporter Companies in Kenya

Your Name: (Optional) _____ Your Title: _____

Company's Name: _____

Contact Information: _____

Company's year of establishment: _____

Declarations:

1. The questionnaire is only for research purpose, the results to be generated will not to be used for any business intention and as such will be treated as confidential.
2. Please fill the questionnaire as objectively as possible
3. If you have any doubt about this survey, please don't hesitate to contact the undersigned

[A] Basic Information about your Company

1. What is the nature of your business ownership?

- | | | | |
|------------------------|--------------------------|-----------------|--------------------------|
| i) Sole Proprietorship | <input type="checkbox"/> | ii) Partnership | <input type="checkbox"/> |
| iii) Limited Company | <input type="checkbox"/> | iv) Parastatal | <input type="checkbox"/> |

2. The main business of your company is involved in is (are)

i) Fruits export

ii) Végétales exports

iii) Both fruit and vegetable exports

iv) Fruit/Vegetable Processor

3. The volume of Asian vegetables processed by your company is (annually)

4. Indicate the types of Asian vegetables that your company trades in

[B] Section One: Value Chain Governance Determinants

1.1 Nature of Transaction

1. Which of the following activities or functions does your organisation directly engage in or outsource for the smooth running of your exporting business:

	Owned	Outsourced
i. Identification and contracting with farmers	<input type="checkbox"/>	<input type="checkbox"/>
ii. Managing importers orders and queries	<input type="checkbox"/>	<input type="checkbox"/>
iii. Testing exports as per approved standard	<input type="checkbox"/>	<input type="checkbox"/>
iv. Packhouse activities: Sorting, packaging	<input type="checkbox"/>	<input type="checkbox"/>
v. Specialised product(s) transportation	<input type="checkbox"/>	<input type="checkbox"/>
vi. Custom house agency & Export documentation	<input type="checkbox"/>	<input type="checkbox"/>

2. What are the key obstacles that your organisation faces in vegetable produce exports

	Yes	No
i) Insufficient coordination due to multiple border controls	<input type="checkbox"/>	<input type="checkbox"/>
ii) Perishability of products due to logistical challenges	<input type="checkbox"/>	<input type="checkbox"/>
iii) Stringent international standards & food safety standards	<input type="checkbox"/>	<input type="checkbox"/>
iv) Tariffs and import restrictions	<input type="checkbox"/>	<input type="checkbox"/>
v) Others.		

Indicate _____

3. Relating your vegetable export supply chain which of the following four areas does your organisation position itself as having an added advantage:

a. Production

	Yes	No
i. Well-coordinated extension services	<input type="checkbox"/>	<input type="checkbox"/>
ii. High productivity	<input type="checkbox"/>	<input type="checkbox"/>
iii. Modern farming practises	<input type="checkbox"/>	<input type="checkbox"/>

b. Processing

	Yes	
No	<input type="checkbox"/>	<input type="checkbox"/>
i. Minimum wastage		
ii. Adequate and appropriate storage	<input type="checkbox"/>	<input type="checkbox"/>
iii. Excellent transport system	<input type="checkbox"/>	<input type="checkbox"/>

c. Supply chain/Logistics

	Yes	
No		
i. Organised supplies of inputs	<input type="checkbox"/>	<input type="checkbox"/>
ii. Availability of modern packaging unit	<input type="checkbox"/>	<input type="checkbox"/>
iii. Availability of Specialised Transportation Trucks	<input type="checkbox"/>	<input type="checkbox"/>

- iv. Technology driven systems
- v. Sufficient volumes of air transport
- vi. Proximity to the freight port

d. Marketing

- No
- Yes
- i. Existence of preferential agreement with importers
- ii. Direct orders from European Supermarkets
- iii. Selling through Middlemen and Women

4. What is your largest operating cost from the four areas under question 3 above?

Briefly explain _____

5. What is the approximate percentage composition of the your employees/workforce

in:

- i. Permanent Staff _____ %
- ii. Contract Staff _____ %

1.2. Quality Assurance, Standards & Certification

6. Does your organisation have a Good Agricultural Practices (GAPs) in place?

Yes No

6.1a. If Yes to 6 above; is the program documented? Yes No

6.1b. If Yes to 6 above; are GAPs audits conducted? Yes No

7. For operations (for example contract growing, harvesting, cooling and packaging operations or entities you purchase from) not under your direct control, are there documented management programmes in place to ensure food safety and quality?

8. Which of the following certification bodies does your organisation belong to:

i) KenyaGap ii) EurepGap iii) HEBI

8.1. Additional other(s)? Please indicate _____

9. Does your organisation have a quality assurance department/Unit or office?

Yes No

9.1. If Yes to 9 above; what position does the head of quality assurance department hold?

Officer Manager Director Other (State) _____

10. Does your organisation have a quality assurance management system?

Yes No

10.1. If Yes in 10 above, please state the system(s) in place _____

11. What procedures are in place to certify the characteristics of healthy and safe products? Briefly state some of the characteristics observed through this checklist

12. Does your organisation conduct regular audits of your processes and products?

Yes

No

12.1. If yes, how often? Weekly Monthly Quarterly

If no, briefly explain your answer _____

13. Are mock product recalls conducted?

Yes

No

13.1. If yes, which of the following indicators were ascertained, that is, the mock product recall: (Tick the appropriate response)

i. Revealed high accuracy of our dispatched products lot numbers

ii. Revealed our good quality management practices

iii. Revealed an elaborate logistics path for tracing our products

14. To what time does your company assure liability of the products it exports? Our liability is assured until the time that: (Tick what best describes your setting)

- i. we sell/transfer products to importers
- ii. the products are sold to retailers
- iii. the products are consumed by the ultimate consumers

15. How have you mapped out your production or processing unit? Explain the throughput process (from receipt of products to packaging).

16. Please indicate how strong you feel your business is for each capability relative to your primary competitors.

Product Quality		Lower		Average		Market leader
i) Conformance quality	1	2	3	4	5	
ii) Product reliability		1	2	3	4	5
iii) Performance quality	1	2	3	4	5	

1.3. Level of Integration

17. Which of the following do you do to enhance internal integration in your organisation (Tick what is appropriate).

- i) Encouraging teamwork by sharing of ideas, information & resources
- ii) Joint decisions making to improve on efficiency
- iii) Regular interdepartmental teams meeting to plan ahead

18. Which of the following do you do to enhance customer integration in your organisation (Tick what is appropriate)

i) Close and frequent contact with our suppliers

ii) Customers feedback on quality & delivery performance

iii) Customer forecasts in our planning

iv) Customers involvement & quality improvement

19. When decisions are made in your organisation does the impact of these decisions significantly consider other partners in the supply chain such as suppliers and customers?

Yes

No

20. Is cross functional integration witnessed in your organisation? Whereby key supply chain activities such as coordination of farms, collaboration with other departments such as processing, logistics, and coordination with section heads are concerned.

Yes

No

20.1. If yes, is this integration mostly aimed at solving problems or preventing problems? _____

21. Which of the following ways describes how you relate with your customers as you enhance customer integration in your organisation (Tick what is appropriate)

i. We share our production plans with our suppliers

ii. We emphasise openness of communication in collaboration with on supplier

- iii. We maintain corporate relationship with our suppliers
- iv. Close communication with our suppliers is maintained about quality consideration

22. What mechanism does your company create in promoting external integration with your key material and crop suppliers and downstream importers and consumers?

- i) Joint ventures
- ii) Product development
- iii) Cross functional teams
- iv) Sharing an Enterprise Resource Planning (ERP) Platform
- v) Others, (Specify)_____

1.4. Nature of Contract

23. In which way do you do business with your biggest downstream customer/ importer?

- i) Oral contract
- ii) Sign sales contract
- iii) Sign production and sales contract
- iv) Downstream agent participants in my company
- v) Participate in Downstream supplier
- vi) Others (Specify)_____

24. In which way do you do business with your upstream suppliers/ farmers?

- i) We give them oral contract
- ii) We sign sales contract
- iii) Sign production and sales contract
- iv) Upstream agent participants in our company

v) We participate in upstream supplier

vi) Others (Specify)_____

25. When you choose an upstream chain supplier, which of the following main factors do you consider critical:

i) Quality ii) Production iii) Procuring experience

iv) Credit v) Stable supply from supplier

vi) Low cost of the supplier

vii) Implementation of traceability systems

viii) Length of your working relations

ix) Compliance to Kenya Gap Certifications

25.1. From the factors that you have selected how do you prioritise them in the order of their importance from the most critical to the least_____

—

26. Does your organisation engage contracted farmers to supplement your vegetable volumes?

Yes

No

26.1. If yes, how many have you formally contracted_____

26.2. If yes, to 26.1, What level of support do you offer to them:

27.3. Logistical Advantage

- i) Seamless flow of products and information along the food value chain
- ii) We have a high level of accuracy to locate dispatched products
- iii) We have stable and reliable intermodal transport means
- iv) We have an elaborate reverse logistics system in case of product recall

[D]Section Three: Traceability Systems

28. Does your organization has any traceability system(s) in place?

Yes No

28.1. If Yes to question 28, is it paper based? Electronic? or Both

28.2. If No to question 29 please proceed to respond to question **38**.

28.3. If your organisation has an electronic traceability please select all the technologies that you are using

- i) Barcodes (GTIN)
- ii) Barcodes (SSGC)
- iii) Barcodes (GRAI)
- iv) Passive RFID
- v) Active RFID
- vi) Wireless sensor technologies
- vii) Global Positioning Systems (GPS)
- viii) Other. Indicate _____

29. What would be the parameters that you seek to provide to a tracking query in order to obtain the information that you require?

- i) Provide a list of item specific identification numbers
- ii) Provide a list of product types to track and/or trace
- iii) Time of observations
- iv) Location of observations
- v) Business step-find the products that were shipped
- vi) Business step-find the products that were received
- vii) Sensor data (e.g. to find products that have temp. variations)
- viii) Undesirable events-find the products that are not in the right place
- ix) Global Positioning Systems (GPS)

30. Does your organisation identify with the following objectives of traceability; namely traceability: (Please tick appropriately, more than one answer is allowed)

- i) Improves product quality & food safety,
- ii) Improves supply chain efficiency,
- iii) Reduces product recall,
- iv) Eliminates/reduces claim liability,
- v) Increases control and assurance of product origin.

31. From your experience, which of the following outcomes do traceability systems offer?

(Please tick appropriately, more than one answer is allowed)

- i) They Promote fast and accurate information exchange in the supply chain
- ii) They allow for compliance with food laws and international regulations
- iii) They give organisation certification and guarantee against fear of opportunism
- iv) They give your organisation confidence to extend credit as proof of product quality & safety
- v) They reduces on challenges of incomplete contracts due to uncertainty & opportunism
- vi) Counterfeit detection

32. Do traceability reports promote decision making by top management about your products and process information?

Yes

No

Briefly explain your answer_____

—

33. Is supply chain visibility promoted by traceability through internal, suppliers and customers' integration? i.e. inside our firm, with our suppliers and our customers?

Yes

No

34. Can traceability as an information tool be considered as a proof or guarantee in the mitigation/reduction of the challenges related to incomplete contracts in the event of monitoring behaviour and conformity to contractual obligations?

Briefly explain your answer_____

35. Can traceability be considered as a quality assurance tool in giving certification of products qualities, production process?

Briefly explain your

answer_____

—

36. Does your organisation identify traceability as a source of competitive advantage by way of: (Please tick appropriately, more than one answer is allowed)

- i) Reducing your threats,
- ii) Creating more opportunities,
- iii) Lowering your overall cost

37. Do you receive any following as feedback from the importers and customers to traceable products? That: (Please tick appropriately, more than one answer is allowed)

- i. Product quality as per the labels in the packaging are ascertainable
- ii. Product location and origin is identified with remarkable high accuracy
- iii. Delivery reliability and products' shelf life is assured
- iv. Products with traceability labels facilitate informed decision making by end consumers

[E] Section Four: Moderating effect of Traceability on Food Value Chain Governance determinants and Competitive Advantage

38. Which of the following outcomes have you established in relation to the quantity and quality of shared information along the Asian vegetables supply chain? Namely, quality of the shared information:

- i. Promotes supply chain efficiency
- ii. Lowers transactional costs in the long run
- iii. Corrects distortions generated by asymmetric information
- iv. Promotes consumer confidence and decision making

39. Due to the influence of traceability, top management in your firm is able to:

i. Accurately account to importers and customers
about the origin of the products that you deal with;

ii. Make informed decision on which out-growers
to engage;

40. Due to the influence of traceability, integration with our key material and crop suppliers and downstream importers and consumers is promoted.

Yes No

41. Due to the influence of traceability, our internal processes such as production, packaging, labelling and logistics are enhanced.

Yes No

42. Due to traceability's influence the nature of relationships along the supply chain are affected by replacing contractual relationships based on trust, to highly engineered technological links based on formal short-period contracts

Yes No

43. The general effect of traceability on governance structures in the food chain is that it turns vertical integration and long term contracts into formal short-period contracts due to supply chain efficiencies and information accuracy.

Agree

disagree

44. Due to the influence of traceability we can give quality assurance to our consumers that our products and services can:

- i) Reveal with high accuracy our dispatched products lot numbers
- ii) Reveal our good quality management practices
- iii) Reveal an elaborate logistics path for tracing our products

45. Due to the influence of traceability, we can demonstrate our competitiveness in:

- i) Assuring process quality of our products
- ii) Promoting product identity and preservation
- iii) Our ability to prepare broad product mix
- iv) locating dispatched products with a high level of accuracy
- v) an elaborate reverse logistics system in case of product recall
- vi) Seamless flow of products and information along the food value chain

46. Any other issue or matter that would improve this study's output? _____

THANK YOU FOR YOUR TIME AND FOR ACCEPTING TO ANSWER THIS QUESTIONARRE

Appendix II: Letter of Introduction

Date:

To

.....

.....

Dear Sir/Madam,

RE: COLLECTION OF RESEARCH DATA

I am a student at Jomo Kenyatta University of Agriculture & Technology (JKUAT) pursuing a Ph.D in Supply Chain. I am carrying out a research on “*Moderating effect of Traceability on the Relationship between Food Value Chain Governance determinants and Competitive Advantage in Kenya’s Fresh Fruits and Vegetables Export*”. I am in the process of gathering relevant data from companies that are association members of Fresh Produce Exporters Association of Kenya (FPEAK), for the purpose of this study. You have been identified as one of the collaborators and a key respondent in this study and I would like to kindly invite you to participate in my PhD research. I therefore write to request for your invaluable assistance towards making this study a success by taking time off your busy schedule to respond to the attached questionnaire.

The information collected and used in the PhD Dissertation will be kept strictly confidential, and you will remain completely anonymous throughout data processing. The final report will be made available to you once all analyses are completed. It will be appreciated if you can fill the questionnaire within the next 3 days and email back to enable early finalization of the study. I thank you very much in advance for your consideration, time and responses. Hopefully we can work together to make traceability issues work for us in form of improving the competitive advantage of our companies.

Yours sincerely,

Martin Kang’ethe

Student Reg. No. HD411-C004-1603/2011

Appendix III: Letter of Authorization

Date:

To Executive Director

.....
.....

NAIROBI

Dear Sir/Madam,

RE: ACADEMIC RESEARCH DATA: RELATIONSHIP BETWEEN FOOD VALUE CHAIN GOVERNANCE DETERMINANTS AND COMPETITIVE ADVANTAGE IN KENYA'S FRESH FRUITS & VEGETABLES EXPORT.

I am a student at Jomo Kenyatta University of Agriculture & Technology (JKUAT) pursuing a Ph.D in Supply Chain. I am required to undertake a thesis whose title is as indicated above as partial fulfilment for the award of the doctoral degree. I am kindly requesting for your assistance in making my research a success by granting permission to collect relevant data of your organization (being a member of Fresh Produce Exporters Association of Kenya) from your Heads of Quality Assurance, Logistics/Procurement, Business Development/Exporters or whoever else you can authorize. I want to assure your office that all the data collected will be treated with utmost confidentiality and will be used exclusively for the purposes of this academic research.

I am looking forward to your kind consideration and at the same time wishing your esteemed organization success in all her endeavours.

Yours sincerely,

Martin Kang'ethe

Student Reg. No. HD411-C004-1603/2011

Appendix IV: List of Kenya's Fresh Fruits & Vegetable Exporters

<p>1.AAA Growers Ltd Mr. Neville Ratemo P.O. Box 32201 - 00600 Nairobi Tel: 020-4453970 - 4 Fax: 020-4453975 neville@aaagrowers.co.ke, admin@aaagrowers.co.ke</p>	<p>2.Agrifresh Kenya Ltd Mr. W. Dolleman P.O. Box 63249, Nairobi Tel: 020-8560650/1/2 Fax: 020-8560653 info@agrifreshkenya.com</p>	<p>3.Kakuzi Ltd Mr. R. Collins P.O. Box 24, Thika Tel: (060)33012/31393 Fax: 067-64433 rcollins@kakuzi.co.ke/ mail@kakuzi.co.ke</p>	<p>4.Kandia Fresh Produce Suppliers Ltd Ms. Lucy Mundia P.o. Box 42806 - 00100, Nairobi Tel: 020 - 3500866 Fax: 020 - 821152 kandia@swiftkenya.com</p>
<p>5.Avo-Health (EPZ) ltd Jeanie Molly P.O. Box 19515, Nairobi Tel: +254728278814 Fax: molly@avohealth.co.ke</p>	<p>6.Avenue Fresh Produce Ltd Mr. C. Muchiri P.O. Box 3865-00506 Nairobi Tel: 020-825342/820015 Fax: 020-825288 info@avenuefresh.co.ke, avenue@avenue.co.ke</p>	<p>7.Keitt Ltd Mr. Asif Aman P.o. Box 6390- 00200, Nairobi Tel: 020 - 822829 Fax: 020 - 827842 asif@keitt.co.ke</p>	<p>8.Kenya Horticultural Exporters (1977) Ltd Mr. Manu Dhanani P.O. Box 11097, Nairobi Tel: 020-650300/1/2 Fax: 020-559115 khe@khekenya.com, manu@khekenya.com</p>
<p>9.Belt Cargo Services Export Ltd Mr. J. Muigai P.O. Box 688, Ruaraka Tel: 020-4448821/4448822 Fax: 0209-4448820 beltcargo@swiftkenya.com</p>	<p>10.Dominion Vegfruits Ltd Mr. John Mairura P.O. Box 55078 - 00200, Nairobi Tel: 020-823002/3 Fax: 020-823005 vegfruits@wananchi.com</p>	<p>11.Makindu Growers & Packers Ltd Mr. O.P. Bij P.O. Box 45308, Nairobi Tel: 020- 822812 Fax: 020-822813 info@makindugrowers.co.ke</p>	<p>12.Mboga Tuu Ltd Mr. J. Kent P.O. Box 47070, Nairobi Tel: 020-3877988/3561196 Fax: 020-3878071 mtl@wananchi.com</p>
<p>13.East African Growers Ltd Mr. P. Mahajan P.O Box 49125 Nairobi Tel: 020-822017/25 Fax: 020-822155 peeush@eaga.co.ke</p>	<p>14.Everest Enterprises Ltd Mr. J. Karuga P.O. Box 52448, Nairobi Tel: 020-824141/823333 Fax: 020-824195 jkaruga@everest.co.ke, smuhoho@everest.co.ke</p>	<p>15.Migotiyu Plantations Ltd Mr. B. K. Rao P.O. Box 19, Mogotio Tel: 051 - 2214898/020-4449128/9 Fax: 051 - 2214898 alphegasial@wananchi.com, migotiyu@kenyaweb.com</p>	<p>16.Global earthgate ltd George Solomon P.O. Box 19184, Nairobi Tel: +254732604932 Fax: info@globalegate.co.ke</p>

<p>17.Famas Growers & Exporters Ltd Alex Mutisya P.O. Box 1106, Nairobi Tel: 0731204636 info@famaskenya.com</p>	<p>18.Fresh An Juici Ltd Ms. Maleka Akaberali P.O. Box 39833 - 00623, Nairobi Tel: 020-826090/3 Fax: 020-826092 maleka@freshanjuici.co.ke,</p>	<p>19.Nicola Farms Ltd Ms. Grace Wanjiku P.O. Box 64-10205, Maragua Tel: 020-2048874/76 Fax: 020-2048874 marketing@nicola.co.ke</p>	<p>20.Sacco Fresh Ltd Mr. J. M. Muia P.O. Box 26211-00100, Nairobi Tel: 020-824687/8 Fax: 020-824689 info@sacco-fh.com</p>
<p>21.Frigoken Ltd Mr. D. Karim. P.O Box 30500, Nairobi Tel: 020-8560096/8560449 Fax: 020-8560098 frigoken@frigoken.com</p>	<p>22.Global Fresh Ltd R. Chaudhry P.O. Box 3970 - 00100, Nairobi Tel: 020 - 827549/50 Fax: 020 - 827551 info@globalfresh.co.ke</p>	<p>23.Samawati Fresh Produce (K) Ltd Ms. M. Nyambura P.O. Box 214 - 00618, Nairobi Tel: 0722-890030, 0721-828474 Fax: 020-234047 bmwangi@samawatifresh.com</p>	<p>24.Shree Ganesh Fruits & Vegetables Ltd Mr. Kanji Kalyan Patel P.O. Box 83745 - ,Mombasa Tel: 020-80243645 meleka@freshanjuici.co.ke</p>
<p>25.Greenlands Agro Producers Ltd Mr. G. Murungi P.O. Box 78025, Nairobi Tel: 020-827080/1/2 Fax: 020-827078 murungim@greenlands.co.ke</p>	<p>26.Hillside Green Growers & Exporters Co. Ltd Ms. Eunice Mwangera P.O. Box 73585 -00200, Nairobi Tel: 020- 3878134/74 Fax: 020 - 3872127/6623 infoland@nbnet.co.ke</p>	<p>27.Sian Exports Kenya Ltd Mr. S.S. Mangat P.O. Box 43042-00100, Nairobi Tel: 020-822220 Fax: 020-890287 rano@sianexports.com</p>	<p>28.Sunripe (1976) Ltd Mr. Hasit Shah P.O. Box 41852, Nairobi Tel: 020-822518/822879 Fax: 020-352266/822709 info@sunripe.co.ke</p>
<p>29.Homegrown Kenya Ltd Mr. R. Fox P.O. Box 10222, Nairobi Tel: 020-3873800/3874193 Fax: 020-3873800/3874940 Richard.Fox@f-h.biz</p>	<p>30.Indu farm EPZ Ltd Mr. C. Bernard P.O. Box 42564, Nairobi Tel: 020-550215/6/7 Fax: 020-550220 info@indu-farm.com/christian. benard@indu-farm.com</p>	<p>31.Value Pak Foods Ltd Mrs. J. R. Patel P.O. Box 42828, Nairobi Tel: 020-823438/823439 Fax: 020-823347 valuepak@wananchi.com</p>	<p>32.Vegpro Kenya Ltd Mr. B. Patel P.O. Box 32931, Nairobi Tel: 020-82283-4 Fax: 020-822753 bharat@vegpro-group.com, ddevraj@vegpro-group.com</p>

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<p>37.Six Square ltd ajay saini P.O. Box 19184-00501, Nairobi Tel: 020-5227423 Fax: info@sixsquare.co.ke</p>	<p>38.marsil fressh export Mary muli P.O. Box 19119-00501, Nairobi Tel: 020-3511367/0722555484 Fax: marsilfresh@gmail.com</p>	<p>39.Tyrobel Fresh Produce and exporters Belinda Achieng P.O. Box 35524-00100, Nairobi Tel: 0721585993/0733717141 Fax: tyrobelexporters.fresh@gmail.com</p>	<p>40.Jade Fresh Ltd Diana Kyallo P.O. Box 9808-00200, Nairobi Tel: 0726758227 Fax: info@jade-fresh.com</p>
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<p>53.Spring fresh growersand exporters Ltd Alice Wanjiru Mathenge P.O. Box 51854, Nairobi Tel: 0722143311 Fax: springfreshgrower@gmail.com</p>	<p>54.Greenpoint Exporters Ltd Justus Oyallo P.O. Box 44496, Nairobi Tel: +254722698870 Fax: info@greenpoint.co.ke</p>	<p>55.Woni Veg-Fru Importers and Exporters Ltd Mr. T. K. Mutiso P.O. Box 52115, Nairobi Tel: 020-532805/650350 Fax: 020-650350 woni@swiftkenya.com</p>	<p>56.The African Herb Co. Ltd Nelson Osano P.O. Box 149-10400, Nyanyuki Tel: +254720412279 Fax: nick.emson@african-herb.com</p>
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<p>69.Freshpak Horticultures Ltd John G. Ngigi P.O. Box 64047, Nairobi Tel: 0721360463 Fax: john.ngigi@freshpak.co.ke</p>	<p>70.Emax fresh fruit Ltd Ahemed M. Abdikadir P.O. Box 6432, Nairobi Tel: 0720851882 Fax: ahmeddhuux@hotmail.com</p>	<p>71.Ibnu-Haret trading Company Abdakhaliq Hassan P.O. Box 103203, Nairobi Tel: 0722414462/0721646746 Fax: xaret1@hotmail.com</p>	<p>72.Scan African Exporters (k) Ltd Muniu Githinji P.O. Box 7382, Nairobi Tel: 020552351/4 Fax: gunnar@south-centralgroup.co.ke</p>
<p>73.Africana Fruit and Veg ltd Godwin Makokha P.O. Box 2873, Nairobi Tel: 0736907034 Fax: 020-824991 africanafruitsandveg@live.com</p>	<p>74.Prime Fruits Distributors Ltd Peter Maina Mwingi P.O. Box 48224, Nairobi Tel: 0202165850 Fax: primefruitltd@gmail.com</p>	<p>75.Reap Horticulture Exporters Ltd Samuel Gichane Warui P.O. Box 48903, Nairobi Tel: 0722973206 Fax: reap@swiftkenya.com</p>	<p>76.Wintechs Merchants Ltd Samson Mureithi P.O. Box 54300, Nairobi Tel: 0722502933 Fax: 041-2220394 wintechsmerchants@yahoo.com</p>
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<p>85.Lycan (EPZ) Enterprises Ltd Catherine W. Njenga P.O. Box 11163, Nairobi Tel: 020-351730 Fax: info@lycanenterprises.com</p>	<p>86.Danka Investments Daniel Njoroge P.O. Box 910494, Nairobi Tel: +254722363803 Fax: Dankainvestment@yahoo.com</p>	<p>87.Athi Farm Exporters ltd Eunice Mwikali Mutune P.O. Box 20204, Nairobi Tel: 0722815652 Fax: info@athifarmexporters.com</p> <p>Gr Flr, Aviation Rd Off Airport North Rd</p>	<p>88.Kenya Fresh Produce Exporters Irene Wanjiru P.O. Box 16845, Nairobi Tel: 0202107232 Fax: info@Kenyafresh.co.ke</p>
<p>89.Vert Ltd Jane Maina P.O. Box 10132, Nairobi Tel: Fax: info@vertfresh.co.ke</p>	<p>90.Superfresh Kenya Ltd Mahesh patel P.O. Box 27533, Nairobi Tel: 0710821092 Fax: superfreshkenyaltd@gmail.com</p>	<p>91.Finlays Horticulture Kenya Ltd Justin Coleman P.O. Box 1022, Nairobi Tel: 020-822060 Fax: info.kenya@finlays.net</p>	<p>92.Freshome Alchemy Ltd Judith Mackenzie P.O. Box 33054-00600, Nairobi Tel: 0708395351 Fax: info@freshalchemy.co.ke</p>
<p>93.Ausmond Farm Fresh Exporter Ltd Monicah Ngungu P.O. Box 30788, Nairobi Tel: 07222626434 Fax: ausmondfarmfresh@gmail.com</p>	<p>94.Signet Fruit and Vegetable Exporters Ltd Muigai Isaac Muigai P.O. Box 4577, Nairobi Tel: 0722524997 Fax: Office@signet.co.ke</p>	<p>95.Interveg exports ltd Purity T. naisho P.O. Box 372, Nairobi Tel: Fax: sales@interveg.co.ke</p>	<p>96.Muzuri Growers Ltd Mr. Jingnesh Desai P.O. Box 38272, Nairobi Tel: 0203664503 Fax: muzurigrowers@gmail.com</p>

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