

**DETERMINANTS OF COMPETITIVENESS OF  
ELECTRICAL AND ELECTRONICS  
MANUFACTURING ENTERPRISES IN KENYA**

**MARGARET KWENGWA CHEMENGICH**

**DOCTOR OF PHILOSOPHY  
(BUSINESS ADMINISTRATION)**

**JOMO KENYATTA UNIVERSITY OF  
AGRICULTURE AND TECHNOLOGY**

**2014**

**Determinants of Competitiveness of Electrical and Electronics  
Manufacturing Enterprises in Kenya**

**Margaret Kwengwa Chemengich**

**A Thesis Submitted for the Partial Fulfilment of the Degree of  
Doctorate in Philosophy in Business Administration of Jomo  
Kenyatta University of Agriculture and Technology**

**2014**

## DECLARATION

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

Signature: ..... Date.....

**Margaret Kwengwa Chemengich**

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

1. Signature: ..... Date.....

**Prof. Roselyn W. Gakure**

JKUAT, Kenya.

2. Signature: ..... Date.....

**Dr. Paul Katuse**

USIU, Kenya.

3. Signature: ..... Date.....

**Dr. Anthony G. Waititu**

JKUAT, Kenya.

## **ACKNOWLEDGEMENT**

This doctoral dissertation would not have been possible without the dedicated support of various people along the way. First of all, I am very grateful to my supervisors, Prof. Roselyn W. Gakure, Dr. Paul Katuse and Dr. Anthony Waititu Gichuhi, for guiding me through the research process. In particular, I would like to acknowledge Dr. Waititu for his invaluable assistance in data analysis and Prof. Gakure for validating the quality of my research work.

A very special thank you goes to Andrew Olale and Charles Rono, my very able team on the ground, for their meticulous and generous help rendered during the fieldwork. Their commitment and hard work certainly made a difference and I am eternally grateful.

But most of all, I am grateful to God for His grace and favour, which has enabled me to get this body of work together in collaboration with the people I have mentioned above as well as those who contributed to it indirectly.

## **DEDICATION**

I dedicate this dissertation to my family, especially:

My two special grandchildren, Samara and Alexis, for your unconditional love;

My daughters, Esther and Charity, for believing and standing by me at all times;

My two nieces, Fiona and Elis, for your love and;

My son-in-law, Alex, for your continued support.

I am grateful for your love and encouragement throughout this endeavour.

Your patience and understanding as I spent numerous hours tucked away at my desk working on this project certainly made the journey more bearable. You all remain my source of inspiration.

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## ACRONYMS AND ABBREVIATIONS

AEEMA	Australian Electrical & Electronic Manufacturers' Association
AERC	African Economic Research Consortium
AfDB	African Development Bank
AGOA	African Growth and Opportunity Act
AITEC	African Information Technology Exhibitions and Conferences
ANOVA	Analysis of Variance
APF	Anti-Privatisation Forum
APF	Africa Partnership Forum
ASA	Advertising Standards Authority
ASAC	American Society of Agricultural Consultants
ATM	Automated Teller Machine
BCG	Boston Consulting Group
BEA	Bureau of Economic Analysis
BPO	Business Process Outsourcing
BRIC	Brazil, Russia, India and China
CAN	Competitive Advantage of Nations
CCK	Communications Commission of Kenya
CEOs	Chief Executive Officers
CI	Competitiveness Index

CM	Common Market
COMESA	Common Market for Eastern and Southern Africa
COMTRADE	Common Format for Transient Data Exchange
CSCO	Chief Supply Chain Officer
CU	Customs Union
EAC CM	East African Community Common Market
EAC CU	East African Community Customs Union
EAC	East African Community
ECA	Economic Commission for Africa
EE	Electrical and Electronic
EPA	Economic Partnership Agreement
EPC	Export Promotion Council
EPI	Environmental Performance Index
EPZ	Export Processing Zone
EPZA	Export Processing Zone Authority
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services

GATT	General Agreement on Trades and Tariffs
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GMM	Generalised Method of Moments
GoK	Government of Kenya
GVC	Global Value Chains
HACCP	Hazard Analysis and Critical Control Point
HDI	Human Development Index
ICT	Information and Communications Technology
IEC	Independent Electrical Contractors
IEEE	Institute of Electrical and Electronics Engineers
IMD	Institute for Management Development
ISO	International Standards Organization
IT	Information Technology
ITC	International Trade Centre
ITU	International Telecommunication Union
JIT	Just In Time
JKIA	Jomo Kenyatta International Airport
KAA	Kenya Airports Authority
KAM	Kenya Association of Manufacturers

KEPSA	Kenya Private Sector Association
KIA	Kenya Investment Agency
KIPPRA	Kenya Institute of Public Policy Research and Analysis
KLR	Kenya Law Review
KNBS	Kenya National Bureau of Statistics
KPC	Kenya Power Company
KPLC	Kenya Power and Lighting Corporation
KRA	Kenya Revenue Authority
KVC	Knowledge Value Chain
LDC	Least Developed Countries
LT	Long Term
MIS	Management Information System
MNC	Multinational Corporations
MNEs	Multinational Enterprises
MoI	Ministry of Industry
MoTI	Ministry of Trade and Industry,
MTP	Medium Term Plan
MTR	Medium Term Report
MUB	Manufacture Under Bond
NAFTA	North American Free Trade Agreement

NCC	Nairobi County Council
NEMA	National Environmental Management Authority
OECD	Organization for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
OLI	Ownership, Location and Internationalization
OLS	Ordinary Least Square
OPEC	Organization of the Petroleum Exporting Countries
PLC	Product Life Cycle
PTAs	Preferential Trade Arrangements
R&D	Research and Development
RBV	Resource Based Views
RCA	Revealed Comparative Advantage
REC	Regional Economic Community
RECs	Regional Economic Communities
RoO	Rules of Origin
SADC	South African Development Cooperation
SAP	Structural Adjustment Programme
SD	Standard Deviation
SEZ	Special Economic Zones
SMEs	Small and Medium Enterprises

SMM	Small Medium-sized Manufacturers
SOE	State Organisation or Enterprise
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa
ST	Short Term
STAR	Studying Teens and Relationships
STI	Science, Technology and Information
STS	Science and Technology Studies
TBT	Technical Barriers to Trade
TFP	Total Factor Productivity
TNC	Transnational Corporations
TREO	Tax Remission for Export Office
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations International Development Organization
USDC	United States Department of Commerce
VIF	Variance Inflation Factor
WEF	World Economic Forum
WTO	World Trade Organization

## DEFINITION OF KEY TERMS

**Clusters** are geographical concentrations of interconnected companies and institutions in a particular field, linked by commodities in which competitiveness brings about high rates of innovation, training and development, knowledge sharing and high quality of workers, resulting in continuous development of high quality products and services that are competitive in the global markets (Porter, 1990).

**Competitiveness** is the process by which firms, through fragmented production processes within international networks, employ high technology competences to add value to proportions of goods and services not necessarily conceived, produced and consumed entirely within one country (OECD, 1992; Hart, 1992; and UNCTAD, 2002).

**Electricals** are parts of electronics (such as light bulbs, electric motors, etc.) operated by electricity (The Business Dictionary, <http://www.businessdictionary.com/> retrieved on 12<sup>th</sup> June 2014).

**Electronics** are devices (such as televisions, radios, and computers) that operate using many small electrical parts (Merriam Webster Dictionary, <http://www.merriam-webster.com/>, retrieved on 14<sup>th</sup> June 2014).

**Foreign Direct Investment** (FDI) is the transfer/acquisition of assets, capital, technology, managerial talent and manufacturing infrastructure from/across borders in form of portfolio or foreign direct investment depending on the form of foreign entry (Cavusgil, Knight & Riesenberger, 2008).

**Global value chains** are relational global business structures underpinned by technology developments supporting fragmented production processes in favour of global/outsourcing and portfolio investment, with strong governance systems across geographical locations (Gereffi, Humphrey & Surgeon, 2005; Levy, 2007; Baldwin & Gu, 2004).

**Globalisation** is the process by which regional economies, societies and cultures have become integrated through communication, transportation and trade, which make partnership sourcing inevitable and results in synchronisation across the chain in different nations and within firms (Ashkenas, Dave, Ulrich & Kerr, 1995; Nghiem, 2013).

**Innovation** is the introduction of new goods, new methods of production, the opening of new markets and new sources of supply, new processes and approaches of carrying out of a new organization of any industry to create new value for the customer (Schumpeter, 1949; Stokic, Campos & da Silva, 2002; Schumann, 2005).

**Logistics** are sets of resources contributing to collaborative approaches and partnerships, to manage competition through legitimate, inspirational means benchmarked to international best practice through improved planning and decision making (Bennet & Rahaman, 2008).



**Manufacturing policy** scenarios consist of partnerships and networks of prosperous geographic regions in the context of factors and competences underpinned by both market-based and non-market policy stances, in form of free trade, liberalisation, privatisation complementary regulatory frameworks and the supportive political environment for enhanced competition (Keynes, 1936; Smith, 1776; Levy, 2007; Haughton & Thornton, 2004).

**Market access** takes into account the business motive of internationalisation and strategies adopted to leverage the recipient country's openness of its markets to foreign goods and services as reflected in the government's economic policies regarding import substitution and free competition (Porter, 1985; Ellis & Williams, 1995).

**Moderating factors** are conditioning, motivational or contingent effects that alter the direction or strength of the causal relationship between an independent or predictor variable and a dependent or criterion variable (Baron & Kenny, 1986).

**Operational environment** constitutes the business environment impacting on critical business practices and decisions in a company's operations; and includes customers, competitors, stakeholders, suppliers, industry trends, regulations, politics and other government activities, social and economic factors and technological development, (Carbonara & Caiazza, 2008; Pearce & Robinson, 2011).

**Policies** are principles or management rules of distributed heterogeneous systems, networks and applications, selections from among alternative options, in light of given conditions; to guide and, usually, to determine present and future decisions for the achievement of rational outcomes. (The Business Dictionary, <http://www.businessdictionary.com/>, retrieved on 10<sup>th</sup> June 2013).

**Regional integration** is the expansion of geographical boundaries, through unification of Partner States, into one big united economic bloc to increase market access and investment areas in an attempt to increase competitiveness (Levy, 2007).

**Regulations** are principles or rules, enforced with or without the coercive power of the law, employed in controlling, directing, or managing an activity, organisation or system (The Business Dictionary, <http://www.businessdictionary.com/>, retrieved on 10<sup>th</sup> June 2013).

**Technology** is systematic knowledge and action of industrial processes that deals with the tools and techniques for carrying out plans and applicable to any recurrent activity (UNESCO, 2013).

The **conceptual/theoretical framework** is a logical structure which guides research, determining what variables and statistical relationships to look for; and moderating factors influencing sectoral competitiveness (Trochim, 2006; Aguilar, Araujo & Quesdad-Aguilar, 2009; Miles & Huberman, 1994; Robson, 2002).

## ABSTRACT

Within the globalising business environment, competitiveness in the electrical and electronics sector is underpinned by technology and innovation developments supporting fragmented production processes. This research endeavoured to establish the determinants of the competitiveness of electrical and electronic manufacturing enterprises in Kenya. The specific objectives of the study were to investigate the effects of technology, innovation, regulations and market access on sector competitiveness moderated through the moderating effect of the operational environment. With over ninety percent of the Kenyan electrical and electronic manufacturing enterprises located within Nairobi; the study sample was drawn from the target population among firms located within Nairobi and its environs, employing more than 10 persons. A correlational survey design was used to investigate the associations between the dependent and independent variables. A 30% sample of manufacturers was drawn using a combination of stratified systematic process while purposeful sampling was applied to the facilitators. Both primary and secondary data formed the basis of analysis. Parametric methods used SPSS packages in data cleaning, instrument validation and estimation of the contributions and effects of the independent variables on competitiveness. The study established that the Kenyan electrical and electronics manufacturing sector was predominantly SME based concentrating in the production of low value-added products and services, attracting low technology and knowledge intensity. Further, the study established the positive and significant effects of technology, innovation and market access in determining the electrical and electronics sector competitiveness. These were heightened with the inclusion of the moderating variable-operational environment. The role of regulations became significant with the

inclusion of the moderating variable. To facilitate the transformation of the electrical and electronics sector's strategic fit into the globalised fragmented production systems, the study recommended policy reforms in the business environment in support of strategic partnerships with multinationals/trans-nationals (MNCs/TNCs); the establishment of a technology fund for upgrading the technology for industry to access funding for technology upgrading; family-based businesses going public to facilitate use of investment funds from the capital markets and the promotion of an innovative culture to sustain continuous industry renewal. The study brings out the customer appeal characterised by cheap-priced short shelf-life products requiring continuous renewal in order to remain competitive. Information access is critical in the liberalised global business environment. The submarine fibre optic backbone infrastructure investments providing international connectivity coupled with extensive countrywide fibre optic connectivity puts the Kenyan industry in an advantageous position to integrate into the global value chains. Further areas of research can be to focus on what keeps away electrical and electronic investors from Kenya, including strategies for unlocking the stringent culture of family-based business ownership.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

With increasing competitive pressures and progressing globalisation, the success of both a country's economy and a firm's performance depend largely on the degree to which they participate in global production networks. In this regard, firms have to reduce their costs and build new opportunities via optimised use of internal and external resources (Yagahouti, Moradi & Tajamohammadi, 2011). This is done on the basis of their core competences; in order to withstand the competitive pressures of more developed competitors (Yagahouti, Moradi & Tajamohammadi, 2011). Enterprises now split their production processes into a number of business functions, which they move around the world on the basis of competence to gain efficiency and/or new markets and resultant improved competitiveness (Cavusgil, Knight & Riesenberger, 2008; Erumban, Los, Stehrer, Timmer & Vries, 2011; Yagahouti, Moradi & Tajamohammadi, 2011).

These re-organisations and relocations on the basis of a firm's core competences have resulted in a paradigm shift of outsourcing and off-shoring of production processes. The net effect has been the emergence of Global Value Chains (GVC) and associated international production networks and clusters [United Nations Conference on Trade and Development (UNCTAD), 2003]. The GVCs involve the dispersal, coordination and re-integration of production-related activities among groups of firms in geographically-dispersed locations (UNCTAD, 2003). Multinationals in these GVC are increasingly purchasing their inputs from Small and Medium Enterprises (SMEs)

(UNCTAD, 2004). This creates the environment for integration of SMEs into the GVC (UNCTAD, 2004). The role of the Small and Medium Enterprises (SMEs) in global trade in these economies is picking up, unlike in the recent past when Multinational Corporations (MNCs) and Transnational Corporations (TNCs) were the dominant players. Revolutionary developments in communication and information technology are driving the emergence of, and quest for, global knowledge and increased environmental and social awareness (UNIDO, 2009).

There are a number of cross-cutting production trends and repositioning of firms across the globe in the case of the electrical and electronics sectors. Labour-intensive volume manufacturing has shifted to contract equipment manufacturers in Asia (Haughton & Thorborn, 2004). However, Europe and the United States retain the high-end, knowledge-intensive stages of the value chain, such as research and product development (Haughton & Thorborn, 2004).

This chapter expounds on the background against which electrical and electronic manufacturing enterprises in Kenya operate vis-a-vis the paradigm shift in the prevailing global competitive business environment. In particular, it covers Kenya's policy and regulatory environment, performance of the manufacturing sector with special focus on the electrical and electronics sector. It also highlights the challenges underpinning the lack of strategic fit of the Kenyan electrical and electronic manufacturing enterprises into the global business architecture. It concludes by stating the study objectives and the associated hypothesis tests of the significance of the variables under investigation, scope, significance and limitations of the study.

### ***Global Trade Trends***

Taken within the historical context, the determinants of competitiveness in the manufacturing sector have evolved over time. Trade, nevertheless, remains the key denominator; having brought along with it civilization and innovation that gave rise to newer, better quality products (Cavusgil, Knight & Riesenberger, 2008). The invention of the railway and ocean transport expanded markets in the 1830s while that of electricity lay the foundation for the use of iron and steel technology in extractive and agricultural industries (Cavusgil et al., 2008).

Liberalisation of economies and the new world order of trading through formation of customs unions such as the European Union (EU), the North American Free Trade Agreement (NAFTA), and regional economic groupings – the East African Community (EAC), the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADAC) among others – have given rise to unprecedented intensification of market competition worldwide (Abdullah & Majid, 2011; UNCTAD, 2002; Levy, 2007). Smaller countries in Africa in particular, responded to the phenomenal global socio-economic changes by consolidating their markets and investment areas through regional economic groupings. The EAC and COMESA Regional Economic Communities (RECs) to which Kenya belongs have adopted trade and investment regimes benchmarked against global rules for purposes of enhancing competitiveness.

According to the Economic Commission for Africa (ECA) (1998) report on global trends, the more successful economies had adopted strategies based on making more effective use of new and existing knowledge and technology throughout the whole

economy. More importantly, international competitiveness is increasingly being defined in terms of the ability to access, learn, adapt, utilise and innovate from available technology (ECA, 1998). Integration into high technology GVC creates more wealth for participating countries (Erumban, Stehrer, Timmer, & Vries, 2011). Firms or nations that fail to innovate and participate in the electrical and electronic GVC lose their competitive positions.

The developed countries as well as emerging economies have used high-technology products, including electrical and electronics, as stepping stones to transform their economies (Erumban et al., 2011). This has been demonstrated through the economic performance of the market leaders worldwide; the United States of America, Europe, Japan and the emerging Asian tigers. The share of high-technology products (electrical and electronics sector) accounted for 21.8% of global trade, with Malaysia and India contributing the highest ratios (Lall, 2000). Consequently, at the global level, the overall ratio of manufacturing outsourced against manufacturing in-house in 2004 was 73% to 27% (Schipper & Haan, 2005). That of developing countries had risen from 10.7% in 1985 to 27% in 1998, as off-shoring takes root (Lall, 2000).

### ***The Kenyan Business Environment and Sector Performance***

In the case of Kenya, the ratio of high-technology products has been declining given the level of Research and Development (R&D) expenditure as reported in the Economic Commission of Africa (ECA, 1998). This was due in part to the country's lack of participation in off-shoring production processes (ECA, 1998). Kenya's industry share of Gross Domestic Product (GDP) declined from eighteen (18) percent in 2005 to fifteen (15) percent for the period 2007-2010 (EAC, 2011). That of trade



stagnated at forty seven to fifty three (47-53%) percent during the period 2005-2010, an indication of stunted technology uptake (EAC, 2011). Kenyan-originating electrical and electronic manufactured products have remained at the bottom of the technology pyramid, the bulk of which are not traded in the global market (ECA, 1998; Magu, 2011). This in part was due to the predominance (over 90%) of small-scale family-owned enterprises. These are not amenable to partnerships or conducive to innovation and investment resource mobilisation.

According to the Kenya National Bureau of Statistics (KNBS) (2011), the majority (66%) of the firms operating in the Kenyan electrical and electronics sector were in electrical repairs. The remainder of 34% were in the manufacture of appliances and hardware (ECA, 1998). These products are not traded in the global markets (ECA, 1998). Further, there was limited trade in these products in the preferential regional trade arrangements of EAC and COMESA to which Kenya belongs. These RECs provided market outlets accounting for 37% and 41% of the exports in 2006 and 2010 respectively (KNBS, 2011).

The Kenyan policy framework has remained prominently market based since independence. There has been sustained prudent fiscal and monetary policy restructuring initiated by the Structural Adjustment Programmes (SPAs) since the 1980s. These were followed by the liberalisation and restructuring programmes of the 1990s complemented with the Government of Kenya (GoK) Economic Recovery Programmes (GoK, 2003:2007); the Economic Stimulus Programme and the long-term strategies anchored on Kenya's Vision 2030. The intended results have not been achieved. In this regard, the strategic focus of the 2010/2011 budget and subsequent

ones has prioritised enhanced national competitiveness to spur increased private sector investment across diverse economic sectors.

Despite the operations of the manufacturing sector in Kenya since World War II, the prospects of transforming Kenya into “a newly industrialising, middle income country; providing a high quality of life to all its citizens ....” as per Vision 2030 may remain a pipeline dream (GoK, 2007). These strategies failed to address the twin challenges of poverty and unemployment (GoK, 2007). In part, this was occasioned by the continued decline in manufacturing sector investments, low productivity and high costs of production. Other challenges included inefficient flow of goods and services, and an unfavourable business environment due to weak institutional and judicial systems. This was in spite of the sustained policy and regulatory reforms and infrastructure investments in the last decade. The industrial sectors were ill-prepared to meet the rapidly-changing global business environment and consumer tastes (GoK, 2007; GoK, 2008).

Further, the effects of globalisation and the influx of sub-standard counterfeit and contraband goods have compromised the competitiveness of Kenya’s manufacturing sector. Other challenges include inadequate capacity to meet product quality standards and International Standards Organisation (ISO) certification; weak industrial linkages and collaboration within and across borders; and weak private sector partnerships. These challenges were highlighted in the 1<sup>st</sup> Annual Progress Report on the Medium Term Plan (GoK, 2008) on the implementation of Vision 2030 (GoK, 2007).

On the basis of the quantum index, Kenya’s domestic production of electrical and electronic products has been on the decline since 2012 (Table 1.1). From a total local demand of KShs 58.5 in 2010, less than 5% of the national demand was met from local production (KNBS, 2014). This was a demonstration of lack of production capacity locally.

**Table 1.1: Domestic Demand of Electricals and Electronics, 2010-2012**

<b>Indicator/Year</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Quantum index (base 2009)	106.9	126.9	125.7
Production ( Ksh billions)	2.3	2.8	2.6
Imports (Ksh billion)	59.0	60.0	60.0
Exports (Ksh billion)	2.8	3.0	5.3
Domestic demand	58.5	59.8	57.3
% of domestic demand met from local production	3.9	4.7	4.5

Source: KNBS, 2014

Worse still, the bulk of the Kenyan production is concentrated in the low-value segments of the electrical and electronic manufacturing with inadequate supplies to the market. In the majority of the cases, production was vertically integrated. Local production consisted of electronic appliances, computer and office equipment, electronic components and consumer electronics, the majority of which are in the lower non-competitive segments. The demand for high-value products, accounting for over 95% of domestic consumption was covered from imports (Table 1.1). As such, the local electrical and electronic manufacturing industry faced stiff competition from imports, in part due to inadequate supply and limited product range.

There is an urgent need to promote high technology value addition for high-yield productivity to sustain the projected manufacturing growth rate of ten per cent (10%) per annum in Kenya. This entails a two-prong approach. First, expanding foreign direct investment into internationally-networked productive sectors; and, second, sustaining the pace of government reforms to create an internationally-competitive business environment.

In assessing the determinants of the Kenyan electrical and electronics sector's competitiveness, this study evaluated the challenges the sector faces in participating in the highly fragmented global value chains, which presently determine competitiveness. The Kenyan sector could benefit from such a fragmented structure, in which multi-polar chains or networks are linked to Multi-National Corporations/TNCs in the GVCs. The Kenyan manufacturing sector is predominantly SME based. The liberalised policy framework, educated workforce and continued investments in the more modern ICT infrastructure gives added advantages. Furthermore, the Kenyan Constitution promulgated in 2010 strengthened property rights, a basic requirement for the security of private investments.

## **1.2 Statement of the Problem**

The key problem in the Kenyan electrical and electronic manufacturing enterprises competitiveness is the lack of strategic fit into the fragmented Global Value Chains (GVC) of production governing global competitiveness. At the global level, electrical and electronic trade accounts for over 20% of international trade. Within a globalised business environment international trade is generally liberalised since the World Trade Organisation (WTO) tariffs have been reduced substantially. However, Kenya's

exports internationally are negligible. Imports on the other hand account for over 95% of the domestic requirements. Though preferential trading arrangements within Common Market for Eastern and Southern Africa (COMESA) at Free Trade Agreement (FTA) and East African Community (EAC) at Customs Union and Common Market level at regional level exist, Kenya's exports into these regional markets was less than 50% of the total exports in 2011 (KNBS, 2012). This could arise from lack of supply of products demanded in the regional markets. Local manufacturers continue to lag behind in technology adoption to facilitate the necessary adjustments in the production processes in response to the changing customer needs in a globalised business environment. The global business environment characterised by stiff competition from substitutes and new entrants' cuts out the local manufacturers' products from trading. Thus the domestic producers experience stiff competition at the national and regional markets.

Further, family-based ownerships are not conducive to partnerships which have better options for infusion of new technology and innovations compatible with emerging paradigm shifts in production. The Kenyan industrial sector has been on the decline due in part to limited additional modern technology investments. This has been occasioned by high cost of production and that of doing business. Halting further decline in industrial sector investments calls for the reduction of the high input costs in energy and transport; enhancing productivity, strengthening the institutional and judicial systems and changing the international negative perceptions which make Kenyan originating products uncompetitive. The business community has hardly exploited the prioritisation of joint ventures, foreign direct investment and hire of

technical licenses/contracts to access investment resources and relevant skill competences that can improve its sector competitiveness.

Within the electrical and electronic sectors, technology and knowledge intensity determine competitiveness. A minority (34%) of the electrical and electronic manufacturing enterprise in Kenya were in the manufacture of hardware and electrical appliances while the remainder (66%) were in repairs and maintenance. The continued manufacture and engagement in the low value added electrical and electronic products and services limit both technology upgrading and required staff skill complement improvements. Further, such low value added investments do not generate adequate profitability for either reinvestment or undertaking of the requisite research leading to new innovations. This is further complicated by the less than favourable enabling business environment to spur private sector investments (Magu, 2011).

The Kenyan economy is fully liberalised. In spite of the market policy stance since independence, the industrial sector in Kenya is ill prepared to meet the rapidly changing global business environment and changing consumer tastes. The Kenyan business community including those in the manufacture of electrical and electronic products have not fully taken advantage of the positive developments in the expanded preferential market access within EAC and COMESA Regional Economic Communities despite the enabling regulatory frameworks benchmarked to international standards and sustained infrastructure investments in the last decade. Further, Kenya has not taken full advantage of the market access provisions in the special bilateral agreements [African Growth and Opportunity Act (AGOA), European Union/Economic Partnership Agreement (EPA)]. Kenya's exports into these markets

were minimal. The globalising business environment has had no impact on Kenya's exports and export basket. Instead, the imports, including those of electrical and electronic products are on the increase.

The developed and emerging economies leveraged high technology products including electrical and electronics to transform their economies, creating employment, economic diversification as well as improving the current account. The skill requirements are less demanding. In any case there already exists a manufacturing base for the electrical and electronic enterprises. As part of responding to Vision 2030 aspirations of poverty reduction and employment creation, this study attempted to recommend on policy scenarios that enhance offshoring and outsourcing to Kenya.

The Kenyan past studies on electrical and electronic sectors were anchored on a single or very few variables. For example, Magu (2011) study focused on improving the macroeconomic framework to stimulate additional investment leading to adoption of new technology to facilitate competitiveness among the Small and Medium Enterprises (SMEs). These sentiments were echoed by Elbadawi and Mwega (1998) who confirmed the role of politics and macro-economic stability in facilitating Foreign Direct Investment (FDI) inflows. Mwakaje (2010) study demonstrated the role of Information, Communication Technology (ICT) in strengthening market access. The role of management in constraining sector performance was highlighted by McCommick and Onjala (2007), and Waithaka (2010).

Studies in Kenya that combine the effect of technology, regulations, innovation, market access and operational environment were not readily available. In this regard, the study sought to establish the combined effects of these constructs as determinants of competitiveness of the electrical and electronic manufacturing enterprises in Kenya within a globalising business environment in which competitiveness is underpinned by fragmented production processes. The net effect was to identify and recommend possible avenues of preparing Kenya take advantage of the emergent changes in the market and changing consumer tastes. Firms or nations that fail to innovate and participate in the electrical and electronic Global Value Chains lose their competitive positions.

### **1.3 Objectives**

#### **1.3.1 General Objective**

To investigate the determinants of competitiveness of electrical and electronics manufacturing enterprises in Kenya

#### **1.3.2 Specific Objectives**

The specific objectives of the study were to:

1. Determine the effect of technology in Kenya's electrical and electronics manufacturing enterprises' competitiveness.
2. Establish whether innovation stimulates Kenya's electrical and electronics manufacturing enterprises' competitiveness.
3. Determine if the regulatory framework has a role in stimulating Kenya's electrical and electronics manufacturing enterprises' competitiveness.



4. Establish the effect of market access on Kenya's electrical and electronics manufacturing enterprises' competitiveness.
5. Establish the role of the operational environment as a moderating factor on Kenya's electrical and electronics manufacturing enterprises' competitiveness.

#### **1.4 Research Hypothesis**

In determining the significance of the independent variables at 5%, this study sought to address the following pertinent null research hypotheses on the individual and combined contributions of the independent variables through the moderating variable to the electrical and electronics manufacturing sector's competitiveness. These were:

1. Technology has no effect on Kenya's electrical and electronics manufacturing enterprises' competitiveness.
2. Innovation is not a stimulant to Kenya's electrical and electronic manufacturing enterprise competitiveness
3. Regulations have no role in stimulating Kenya's electrical and electronic manufacturing enterprise competitiveness.
4. Market access is not a determinant of Kenya's electrical and electronic manufacturing enterprise competitiveness.
5. The operational environment has no moderating effect on Kenya's electrical and electronic manufacturing enterprises competitiveness.

## **1.5 Significance of the Study**

The emergence of a globally-networked society buttressed by new consumption patterns and globalization of value chains dictates that countries identify unique segments and localise in clusters offering competitive advantage in order to sustain competitiveness. Kenya stands to benefit from the off-shoring strategy; giving local firms the opportunity to innovate and upgrade their capabilities by moving up the value chain into the medium to high technology and knowledge-intense segments. It was in this regard that this study addressed the electrical and electronics sector's competitiveness that is underpinned by networked global frameworks. This was to explore avenues of preparing Kenya take advantage of the paradigm shift in production, societal consumption patterns and internet-based logistics; through adapting policy, technological and innovative research.

The beneficiaries of this study constitute the government, private sector and the general public. The general public benefits to the extent that they have new opportunities for employment as well as accessing better quality products at affordable prices. The study findings and recommendations provide the possible lines of action to migrate the Kenyan electrical and electronics manufacturing into GVCs. Symbiotic partnerships across the public and private sector within and outside the country are critical for the success of participating in global value chains that dictate competitiveness in the electrical and electronics sector. This would be enhanced through expanded ICT connectivity within and outside the country.

Through the crafting of appropriate business-friendly policies and regulatory frameworks attractive to investors, the government would have a chance to realise the aspirations of Vision 2030 in poverty reduction, employment generation and wealth creation for the nation. Participation in the GVCs creates the opportunities to diversify Kenya's economic activities. This would also speed up Kenya's integration into the regional and global markets. In addition, new streams of skill competences would be added to the labour market.

With the liberalised business environment, the general public is already exposed to modern electrical and electronics products and services. Appropriate government interventions are required to facilitate off-shoring of the production processes into Kenya within the relevant global value chains while sustaining competitiveness within the existing macroeconomic policy frameworks. In addition, the government has to address access and affordability of trade and investment-facilitating instruments. These include: energy supply, information, communication and transport infrastructure and cost of finance.

Since the Kenyan manufacturing sector is Small Medium Enterprise (SME) based, the electrical and electronics manufacturers need to be organised into clusters aligned to GVCs in order to benefit from Foreign Direct Investment (FDI) off-shoring partnerships. This will assist in upgrading their technology and product range as well as expanding management skills and competences to facilitate sector integration into the global value chains. The loss of these opportunities undermines Kenya's future competitiveness.

## **1.6 Scope**

The study focused on the electrical and electronics sector manufacturing enterprises within Nairobi and its environs and employing more than 10 employees. This is because the industry is dominated by small and medium manufacturers, ninety (90%) percent of whom are located in Nairobi. Other integral stakeholders to the study were industry policy makers and support institutions of the Ministries of Trade and Industry (MoT & I), the Kenya Investment Agency (KIA), the Export Processing Zones (EPZs), the Export Promotion Council (EPC), the private sector coordinating associations - the Kenya Association of Manufacturers (KAM) and the Kenya Private Sector Association (KEPSA) and electrical and electronics manufacturers.

## **1.7 Limitations**

A number of limitations were experienced in the implementation of the study. There was no way of confirming the comprehensive coverage of the target population. It was assumed that the Kenya National Bureau of Statistics (KNBS) register was comprehensive. However, there was the possibility of incomplete listing of the KNBS master frame. Nevertheless, an attempt was made to validate the target population by merging the KNBS and Kenya Association of manufacturer's (KAM) lists, since some of the KAM members were not listed in the KNBS master frame.

Due to the limited participation of the Kenyan electrical and electronics sector in the global value chains, there was the possibility of lack of understanding of the GVCs concepts that define current production structures. These limitations translate into the possibility of collecting data that was inappropriate for identifying the determinants of competitiveness with the consequent non-utilisation of the findings for policy

scenarios in the electrical and electronics sector. This was, however, moderated through advance consultations with key stakeholders in the public and private sector, to ensure relevant information on pertinent issues was incorporated in the questionnaire for subsequent results analysis. In addition, professional support was enlisted from the supervisors at all times to ensure that appropriate models and information was collected for analysing the research constructs.

The limitations of country-specific studies for comparison were addressed through taking into account experiences from other countries where similar studies have been done. The study further suffered from inadequate coverage of business environment issues (politics, culture, SOE intermediation) with high impact on investment decisions and FDI flows.

The bureaucratic processes particularly in the public sector and the secrecy in the private sector on corporate information, was ameliorated through the use of simple questionnaires and, where possible, appropriate personal interviews to obtain the relevant information were conducted. Further, firms were given the option of not disclosing their identities to ensure information could not be traced back to the respondents. In any case, the information sought did not require release of confidential company information. Data was anonymised and normalised before analysis.

The lack of a policy mix anchored on well-articulated policy options of the appropriate segments of the electrical and electronics manufacturing industry within the GVCs had kept off the Kenyan industry from taking advantage of the opportunities in the regional and global markets. Delayed industrial policy reforms

will limit Kenya's creation of employment opportunities. Further, the Kenyan family-based ownerships in the manufacturing sector limits partnerships critical in investment expansion and diversification of the electrical and electronics sector into the higher value-added segments. This is compounded by the weak private sector unable to take advantage of available open patents. Since governments in developing countries play a central role in attracting FDIs, the inadequate detailed coverage of the business environmental issues (covering politics, culture, and SOE intermediation) limits the country's capacity of investment expansion. In spite of these limitations, the findings of the study were relevant.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents the theoretical and empirical literature reviewed underpinning the determinants of competitiveness in electrical and electronics manufacturing enterprises in Kenya. The literature review takes into account the context of the global business environment with a view to identifying the relevant empirical evidence and knowledge gaps on the pertinent constructs of interest. It further integrates the business environment, which encompasses all the factors that affect a company's operations. Such an environment includes customers, competitors, stakeholders, suppliers, industry trends, regulations, other government activities, social and economic factors and technological developments (Thompson, Strickland & Gamble, 2010). Taken collectively, these factors assist in defining the conceptual frameworks that guided the research (Goodwin, 2005; Dudgeon, 2008; Dayahka, 2007).

#### **2.2 Theoretical Review**

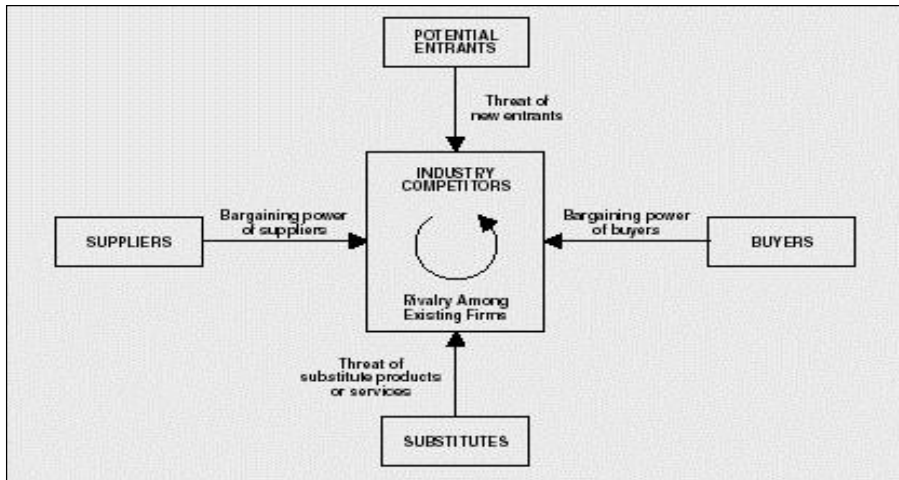
A theoretical framework on competitiveness in manufacturing is multi-dimensional. It embraces aspects of price, quality, productivity, efficiency and macro-economic environment (Badri & Toure, 2010), employment and sustainability (OECD, 2007). In a globally-competitive landscape, competitiveness is sustained through rising productivity originating from innovation, invention, Research and Development (R&D) and service provision (OECD, 2007).

Competitiveness theories have evolved over time with the changing business environment, gradual integration of the global economy and the changing patterns of production and consumption. The classical theories of competitive and comparative advantage have given way to the contemporary theories in the new paradigm shift of off-shoring production processes (Cavusgil, Knight & Riesenberger, 2008; Smith, 1776; Heckscher & Ohlin, 1919; Kojima, 1975). The theories impacting on the competitiveness of the electrical and electronics manufacturing are summarised in the sections below.

### **2.2.1 Porter's Five Forces**

According to the Porter (1985) Five Forces Model (Figure 2.1), there are three horizontal and two vertical forces of competition. The horizontal forces of competition comprise of the threat of substitute products with low prices and high performance, the threat of established rivals on the basis of costs, brands, barriers to exit; and the threat of new entrants on the basis of government policies and regulations, distribution channels, economies of scale and high product differentiation. The components of vertical competition are the bargaining power of suppliers arising from monopoly, product differentiation, and forward integration and the bargaining power of customers as occasioned by price, substitutes, and backward linkages. However, this model underplays the role of the operational environment in the form of culture, geopolitics, local contribution and tastes in shaping sector competitiveness. In this study, competitiveness within the framework of the Porter's Five Forces was addressed with regard to the number of players (suppliers and buyers) in the market and product/service diversity and intensity of trade from local and imported products.





**Figure 2.1: Porter's Five Forces of Competition**

(Source: Porter, 1985)

### 2.2.2 Porter's Value Chain

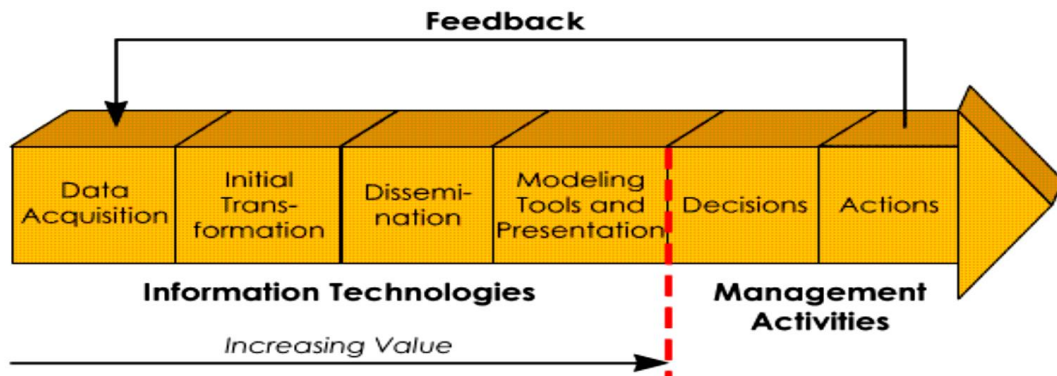
Porter's Value Chain, which situates firm activity and products along a continuum, is one of the theories of competitiveness aligned to fragmented production processes [Porter, 1985; the United Nations Industrial Development Organization (UNIDO), 2009]. It builds on the fact that a product is rarely consumed in its original form (UNIDO, 2009). In this context, competitiveness is defined through the transformational combinations of such products with others along the chain including being transported, packaged, marketed and serviced until they reach the final consumer (Porter, 1985; UNIDO, 2009). In the case of Global Value Chains (GVCs), this entails management of supply chains within and across firms (UNIDO, 2009). This translates into the creation of governance structures shaped through the dominance of internationally-operating buyers and retailers (UNIDO, 2009). It also encompasses innovation systems focusing on building individual and collective competences among value chain actors in networks (UNIDO, 2009).

This was reflected in the study through customer/supplier chain relationships and the location of manufacturers in the value chain. It took into account that producers and processors in developing countries face unique difficulties of integrating their production activities into global networks. This, in part, was occasioned by the challenge of upgrading firm technologies, building the capacity for complying with international business rules and market standards; lack of investment resources on infrastructure development; and inadequate political and governance structures to levels that are comparable to those of developed countries (UNIDO, 2009).

### **2.2.3 Haines Customised Value Chains**

Haines (2005) Customised Value Chains acknowledge that businesses involve different stakeholders in the form of shareholders, customers, suppliers, workers and partners. These all have different aspirations and competences in both formal and informal arrangements, with a role in competitiveness. They have to be harnessed in a symbiotic way for the benefit of all players along the chain (Haines, 2005). Information Technology (IT) was critical in the various value chains, with customer value proposition management as the central anchor on which businesses have to evaluate their contributions in the highly competitive environment. Other value propositions are related to those of partners, suppliers, employees and investors. According to Haines (2005), the Information Value Chain was the packaging and repackaging of publishing content across multiple business relationships for ease of access and comparison (Figure 2.2).

The IT platform, through the new media, enables ease of flow of factors in establishing competitive intelligence in companies. For example, information packaging through appropriate modelling IT tools facilitated both business executives and customers to make decisions. The challenge, however, lay in information overload and increased complexity requiring increasing time and energy input to discern the levels of product/service competitiveness. The new media platforms are rich in diverse types of information though they may not necessarily be perceived as improving the Information Value Chain. In this study, the Haines Customised Value Chains were analysed with regard to their contribution to the institutionalisation of trade, facilitating logistics in form of supplier/buyer networks and the existence of firm-level ICT management systems and websites.



**Figure 2.2: Elements of the Information Value Chain**  
(Source: Phillips, 1994)

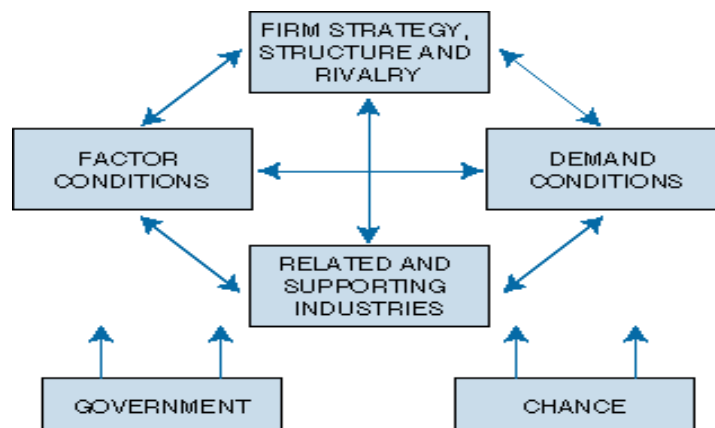
In addition, the Haines Customised Value Chains were leveraged in the context of information sources, distribution networks and partnerships for entrenching market access for electrical and electronics products and services.

#### **2.2.4 Dunning Eclectic OLI Theory**

The Dunning Eclectic Competitiveness Theory (2001) anchored on Ownership, Location and Internationalization (OLI) and it highlights firm entry mode decisions as being critical in competitiveness. Entry strategies leverage ownership or a firm's competitive advantage in the form of knowledge, skills, capabilities, processes and physical assets. These include management techniques, economies of scale and economies of scope transferrable within multinational branches and subsidiaries. The location specific/comparative advantage and entry strategies embodied in economic, political and cultural structures and systems influence firm choices in search of resources. These include a large reservoir of raw materials, low cost labour, technology, and market size. The strategically-beneficial locations arise from the fact that different locations have different resources, institutions, and regulations affecting revenue and the cost of production; with consequent impact on competitiveness. These are reinforced by Porter's Generic Competitive Strategies (1995; 1998) based on cost and product uniqueness, differentiation, and niche markets that took into account the global challenges and dilemma of standardisation and convergence of customer preferences, thus intensifying competition (Teece, 1998; Spulber, 2007). In this study, the OLI theory was applied through assessment of the relationship of the responding manufacturers with their suppliers/buyers, export/import strategies and location of the main product produced and value in the supply chain. The net effect brought into focus the level of fragmented production systems.

### **2.2.5 Porter's Diamond of National Competitiveness**

Collectively, the competitiveness forces at the national level are manifest in factor and demand conditions, related and support industries, firm strategy, structure and rivalry, government and chance events (Figure 2.3) (Porter, 1990). However, firm competitiveness depends on its strategic fit into the relevant global value chains of geographic clusters and networks determining competitiveness in the contemporary business environment. Consequently, firm survival depends on its ability to sustain open market competition as opposed to domestic protection. Instead, the domestic policy environment, through appropriate regulations, should foster raising safety, environmental standards and encouragement of cooperation between buyers and sellers as well as deliberate investment in education in order to improve factor endowments. This study, in particular, employed the Porter's Diamond of National Competitiveness in evaluating the impact of the operational environment in the context of economic, political and business environmental factors on the electrical and electronics sector's competitiveness. It also assessed the linkages between the electrical and electronics manufacturers with support institutions and staff competences critical in product quality and production efficiency and, by extension, competitiveness.



**Figure 2.3: Michael Porter's CAN Diamond**

### 2.2.6 Competitive Strategies

A number of global competitiveness strategies and tactics that businesses can choose from (Appendix 6) include Porter's Generic Competitive Strategies (1985; 1998) based on cost and product uniqueness and differentiation. According to Porter (1985), the specific strategies take into account local and foreign competitors' conditions with regard to global challenges and the dilemma of standardisation on account of convergence of customer preferences and customisation. Other strategies include home conditions of supplier, partner and customer countries of competitors and legal and regulatory climates—trade agreements. The differences in global value chain connections, products, brands and technology and politics relate on how they impact differently on home country policies in prioritising competitive strategies to apply while trading. However, competitive advantage does not last forever because firms either copy their competitors or new technologies come into operation (Prahalad & Hamel, 1990; Teece, 1998; Spulber, 2007). Consequently, firms or nations that fail to innovate in order to remain relevant lose their competitive positions in the market. In the case of electrical and electronics sectors, they have to participate in the GVCs

that now govern sector competitiveness. This, in the study, was analysed by establishing the latest time technology upgrades were done at firm level as well as introduction of new management systems and staff skill upgrades.

### **2.2.7 Global Competitiveness Index**

The Global Competitiveness Index (GCI) measure, tying competitiveness to a nation's technological advancements, placed the Kenyan manufacturing sector at the bottom of the scale (Figure 2.4) (Waheeduzzaman, 2011; Kiggundu & Uruthirapathy, 2010; Lall, 2000). Kenyan manufacturers were predominantly resource-based, experiencing high production costs, inadequate staff skills and low-innovation aptitudes. The manufacturers also faced limited options for attracting partnerships typical of fragmented processes in the current competitive environment. Nevertheless, the GCI concept misses out on the need for a firm's strategic fit into the global value chains to sustain competitiveness.

The competitiveness of the Kenyan manufacturing sector, which remains predominantly SME-based, was best served through linkages and networks with Multinationals/Trans-nationals (MNCs/TNCs) (Lall, 2000). Such partnerships created opportunities for leveraging MNCs/TNCs competences from skilled labour, research, innovation and business sophistication that play a more important role in competitiveness (Lall, 2000). The electrical and electronics sector's competitiveness in the study was analysed through trade performance, age of technology in use, level of participation in GVCs and intensity of partnerships in trade and investments. The GCI formed the basis against which to benchmark the findings from the study. Similarity of the findings of the variable impacts on the electrical and electronics

sector's competitiveness with GCI indicators confirmed that, in addition to the validity and reliability of the instrument, the sample was drawn from a normal population.

	Resource-based (Developing countries)	Low Technology	Medium Technology	High Technology (Developed countries)
	Processed food; Wood; Leather; Refined petroleum; Rubber products; and Other resource-based products	Textile, Garments Footwear; Furniture, Glass wear and Toys	Automotive industry; Chemicals Metal products Machinery	Electronics; Pharmaceuticals Biotechnology Precision instruments Aerospace

**Figure 2.4: Technology Classification of Exports**  
[Source: Lall's Technological Classification of Exports (2000)]

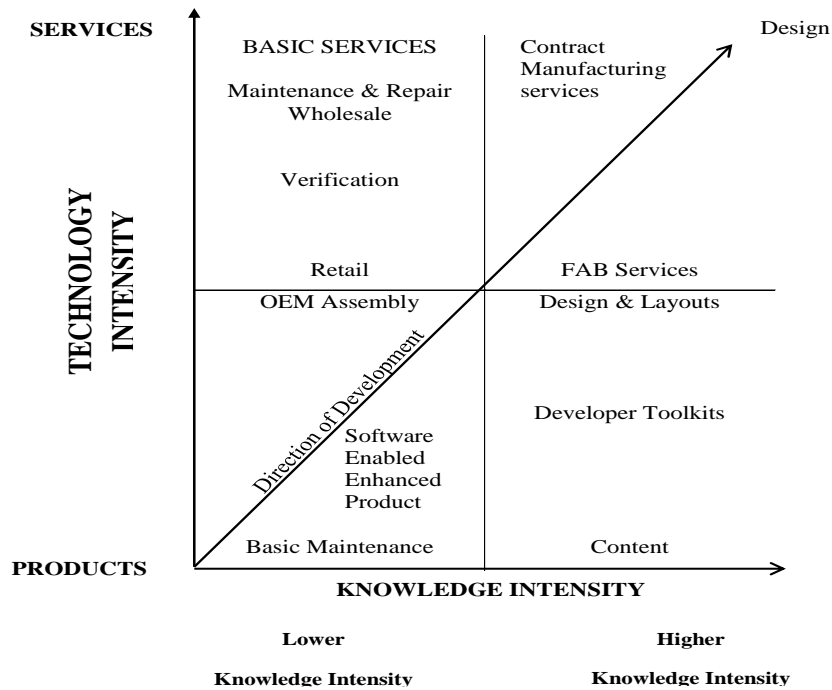
### 2.3 Empirical Review

Within the electrical and electronics sector, technology and knowledge intensity are critical factors in determining the sector's competitiveness. However, electrical and electronics products have a lower knowledge intensity compared to services; and with design requiring highest knowledge intensity (Haughton & Thorborn, 2004) (Figure 2.5). In this regard, the electrical and electronics services sector covering Design and R & D design is more competitive than the sector's products.

The Kenyan electrical and electronics sector, which is predominantly (66%) in repairs, is consistent with low technology and knowledge intensity, and thus operates from lower competitive segments. Actual manufacture, comprising 34% of operators, specialises in original equipment manufacturer (OEM) of low-technology intensity and limited-knowledge intensity (Haughton & Thorborn, 2004). On the basis of



specialisation and in relative terms, the Kenyan electrical and electronics sector falls in the uncompetitive segments (Haughton & Thorborn, 2004).



**Figure 2.5: Dimensions of specialisation order in electronics**  
 [Source: Centre for Strategic Economic Studies (2004)]

On the basis of technology and knowledge intensity used in the categorisation of the electrical and electronics products and services, as presented in Figure 2.6, the bulk of the Kenyan-originating products fall under the low technology and knowledge intensity segments.

	Low-technology intensity	Medium-Low	Medium	High-Medium	High
					Design R&D
			Electronics components	Consumer electronics	(Electronics services, bio-technology)
	Electrical products	Industrial electronics	Automotive components, medical equipment, IT and mobile components, instrumentation, smartcards, alarm systems	Digital cameras TVs VCRs Audio equipment Telephony Digital to analogue External power adapters Battery charging systems, Set-top boxes	
	Computer and office equipment (Monitors, computers, Fax machines, multifunction devises, printers)	Testing and navigation equipment, medical and optical equipment			
	Residential Appliances (air conditioners, fans, dish wasters, fridges, washing machines)				

**Figure 2.6: Categorisation of electrical and electronics products and services**  
 [Source: International Standards of Industrial Classification (ISIC R 4)]

There are limited, narrowly-focused studies on the electrical and electronics sector's competitiveness in Kenya and fewer still on fragmented electrical and electronics manufacturing. Studies from both developed and developing countries were blended with the few Kenyan experiences to form the basis for the Kenyan study (Appendix 18). A number of empirical studies on the electrical and electronics sector's competitiveness employed the OLI theory and value chain analysis theories.

Afif's (2009) study investigated the role of fragmentation in the Moroccan electrical and electronics sector. It established that liberalisation, MNC-FDI connection, politics, perceptions, incentives and regionalisation policies had significantly reduced

trade costs, making the Moroccan-originating electrical and electronics products more competitive. The net effect was the attraction of additional investments in selected sections of the electrical and electronics sector and related industries; underpinning the strategic transformation of the economy from a low- to medium-technology country since 2003.

Newton's (2008) research on factors affecting the location of the United States of America (USA) Foreign Direct Investment (FDI) pre- and post-the-9-11, 2001 terrorist attack, confirmed investors' market-seeking behaviour (OLI theory). It reaffirmed that efficiency and a conducive operational business environment influence business locations (Dunning, 1998). McDade's (2005) study on new generation of Africa entrepreneurs leveraged Porter's Diamond of clustering principles, government regulations, and factor and product conditions influencing the decisions of such entrepreneurs to join global operators in order to sustain competitiveness. The OECD (2000), through Porter's Diamond (1990), underscored the role of government as a critical determinant impacting on China's FDI and, subsequently, influencing comparative and competitive advantage.

Other empirical studies reviewed on the structure and evolution of global value chains included Gibbon (2005), Gereffi (1994), Humphrey (2000; 2002) and Schmitz (1999). These demonstrated that different types of global value chains were driven by the power of multinational buyers in industrialised countries and others by the supplier power of large manufacturers that determine country-specific competitiveness (UNIDO, 2009).

Globalisation, arising from WTO international obligations, convergence of technology and communications, has impacted on consumer cultures and tastes. The most appropriate competitiveness theories in the Kenyan electrical and electronics manufacturing sector are best defined by Porter's Diamond of National Competitiveness (1990), Porter's Value Chain analysis (1985), the Dunning Eclectic (2001), the GCI Index and Lall's (2000) Classification of Exports.

In addition, relationships within clusters bring about high rates of innovation, training and development, knowledge sharing and sourcing for high-quality workers; resulting in continuous development of high-quality products and services that are competitive in the global markets (Grabowski & McCormick, 1998; UNIDO, 2009). On the other hand, developing country value chains are heavily influenced by external forces of government and development agencies (UNIDO, 2009). Nevertheless, collectively the nation's competitiveness depends on its firms' strategic fit into the relevant global value chains. In the review of the study variables, the relevant theories against each of the independent and moderating variables formed the basis for the empirical evidence on competitiveness.

### **2.3.1 Regulations**

According to Levy (2007), a number of policy scenarios with accompanying regulations are critical for the functioning of markets in a competitive environment. One of the policy scenarios reviewed in Appendix 6 is the Classical Price Theory determining supply and demand (Thornton, 2011; Smith, 1776; Say, 1803; Ricardo, 1817). This is similar to Keynes (1936) and WTO's Open Market Principles (Grampp, 1965). The functioning of these market policy scenarios is anchored on

revised regulations benchmarked to international best practice. In the case of Kenya, these include trade regulations anchored on customs administration in the Customs and Excise Act , CAP 472 (EAC, 2005), licensing of intellectual property rights in the Industrial Property Act, CAP 509 (KLR, 2001), the Standards Act, CAP 496 (KLR, 2012), the Labour Act, CAP 14 (KLR, 2012), the Products/Services Anti-counterfeits Act, CAP 13 (KLR, 2008), the Weights and Measures Act, CAP 513 (KLR, 2012), the Trade Descriptions/Marks Act, CAP 505 (KLR, 2012); the Investments for Promotion Act, CAP 585 (KLR, 2004 Rev 2007); the Foreign Investment Protection Act, CAP 518 (KLR, 2010), the Environment Act, CAP, 1999 (KLR, 2010), the Consumer Protection Act, 2007 (KLR, 2010), the Commercial Development Corporation Act (CAP 445) (KLR, 2012) and the Contracts in Restraint of Trade Act (CAP 24) (KLR, 2012).

Other regulations impacting on competitiveness include those pertaining to currency and money transfer, expropriation and compensation; taxation and incentives, dispute settlement, local and foreign property rights and investment options; governance mechanisms and associated transparency commitments. The functioning of these theories and operational regulations, at the global level, was however contradicted by the recent market failures - the 2008 financial and subsequent Euro crises and Enron scandal; in which the lack of regulations undermined the functioning of markets. Thus, strengthening the moderating government interventions is critical for the proper functioning of markets.

There have been a number of empirical studies, drawing on Porter's Five Forces of competitiveness, the value chain analysis and generic competitiveness strategies; and the Dunning OLI theory explaining the role of regulations in the functioning of electrical and electronics manufacturing sectors. The Dunning Eclectic (2001) Theory has been used to explain the Chinese FDI inflows that had largely resulted from consistent and supportive government intermediation through Standards of Excellence (SOEs) complementary market-based policies to enhance firm competitiveness. However, the restrictions in the financial sector undermined China's booming FDI-facilitated sectors (OECD, 2000). Investment protection and promotion and regulatory policy frameworks, including establishment of special economic zones for exporting companies catalysed FDI in the successful emerging economies (OECD, 2000).

In the case of manufacturing, trading arrangements and the policy and regulatory scenarios were underpinned by behaviour-changing, market-based instruments and tools. These include taxes, subsidies, penalties, accreditation systems, information access and non-market policy stances and the supportive political environment consistent with competitiveness that flourished (Keynes, 1936; Smith, 1776; Thornton, 2011). The net effect was reflected in the investor and consumer portfolio optimisation levels of satisfaction and preferences (Norsad, 2010; Bernoulli, 1738; Edgeworth, 1881). Eusuf (2006), in reviewing India's competition policy and consumer rights, acknowledged that natural monopolies render government regulations ineffective while denying consumers the benefits of liberalisation.

Consistent with the World Trade Organization (WTO) global, market-based policy, Kenya has continued to liberalise and deregulate its domestic markets since the late 1990s. This is reflected in the revised industrial, trade and regulatory frameworks governing manufacturing. The appropriate enabling regulatory frameworks, including institutions to oversee such operations, are in place. However, the Kenyan private enterprises in the electrical and electronics sector have as yet to adapt to the new fragmented production systems consistent with contemporary competitiveness. The private sector stands more chances in appropriating the regional markets of the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC). This is validated by the market share of Kenya's exports into the regional market accounting for close to 50% of the total exports.

Empirical evidence, from a few local pioneer cases reviewed in Appendices 8, 9 and 20, however, confirmed that adapting to the changing business environment is beginning to pay dividends in the context of firm competitiveness. McDade and Spring (2005) evaluated the business acumen of the new generation of African entrepreneurs. They conducted a survey of 57 networked business men and women from 10 countries (Botswana, Ethiopia, Ghana, Kenya, Mali, Senegal, South Africa, Uganda, Zambia, and Zimbabwe). They established that networking has expanded the horizons for private sector-led development interconnected to the global competitive businesses. However, the contract and transaction cost theories typical in the present-day functioning of competitive markets remained key challenges for the Kenyan electrical and electronics sector's competitiveness (McDade & Spring, 2005).

With liberalisation and deregulation of the Information Communication Technology (ICT) sector in Kenya since the late 1990s, service delivery has been transformed. In a survey of SMEs in Kenya and Tanzania, Matambalya and Wolf (2001) confirmed the centrality of ICT as a mechanism for networking SMEs in the value chain in order to cope with global competitiveness, even in instances where the legal framework may not be in place. Similarly, the introduction of mobile phone technology has transformed the quality, cost and mode of service delivery in Kenya (Aker & Mbiti, 2009; Jack & Suri, 2010). In some cases, it introduced more suitable competitive business models in non-traditional business fields (Aker & Mbiti, 2009). The ICT market information systems also facilitated FDI flows into Kenya (Okello & Ndirangu, 2010; Kiggundu & Uruthirapathy, 2010; Rios-Morales & Brennan, 2010). Better benefits could be realised if intensified research was directed at product development and improvement, systems and processes, and customer satisfaction to overcome organisational and competitor challenges (Guimaraes, 2011; Mackus, 2003).

Unlike developed and emerging economies where TNC-SME linkages were instrumental in modernising and dynamising local industries, government interventions were critical for developing countries' competitiveness (Henisz, 2002; Waheeduzzaman, 2011). These were achieved through control of incentive structures, institutions and use of factors of production (Henisz, 2002; Waheeduzzaman, 2011). The Export Processing Zones (EPZ) schemes in most developing countries are under government control. They are known to have assisted in bridging linkages between multinationals and SMEs, leading to enhanced market access. The Kenyan electrical



and electronics manufacturing sector was not among industries benefiting from operational EPZ schemes. This calls to question what else besides the family ownership characteristic in the Kenyan enterprises needed to be looked into. This study explored the effects of globalisation, multilateral agreements, regionalisation and Preferential Trade Arrangements (PTAs) policies with support regulatory frameworks in influencing sector participation in the global value chains as an option for enhanced sector competitiveness in Kenya.

### **2.3.2 Technology**

At industry level, while taking into account the liberalised market-oriented environment, Porter's Five Forces of competition underpinned competitiveness. This was achieved through the distinctive forces of rivalry from existing and new entrants, substitutes and bargaining power of suppliers and buyers on the basis of quality, price, delivery and subsequent support services. At the national level, the clustering of sectors on the basis of firm strategies, structure, demand and factor conditions through related support industries and government interventions determined the intensity of competition. Technology underwrites a number of processes leading to competitiveness.

The technology theories reviewed in Appendices 8, 9 and 18 enhancing competitiveness, prioritised the dominant models of Latour (1997) actor-network theories; DeSantis and Poole (1994) and Orlikowski (1992) structuralism rules and resource-based theories; and Hughes & Schmitz (1992); and Luhmann (2000) systems theory anchored on historical competence developments embodied in technologies that have been improved over time for enhanced productivity and consequent

competitiveness. The systems theory, however, does not take cognisance of the new technologies that may not have any historical records for comparison; in particular, the modern-day technological developments that put emphasis on applications of ICT-facilitated operations for winners (Hidding, Williams & Sviokola, 2011).

A study of successful strategies in 15 platform industries complemented by historical records of IT products that enable a network of users to communicate with each other did not fully explain why leaders win or remain competitive at the top (Hidding, Williams & Sviokola, 2011). Nevertheless, the prevalence of follower advantage, through FDI partnerships, implied that one could leverage the framework of the first mover in order to be a winner or remain competitive. For example, internet-based technological developments have made instant communication possible worldwide. This is demonstrated through e-mails, social media like Facebook, twitter, YouTube among others; rendering traditional methods of communication obsolete (Postmes, Spears & Lea, 1999; Markus & Robey, 1988; Orlikowski, 1992). Technology versatility now, more than ever before, influences historical patterns in order to cope with man's continued desire to improve on the efficiency and competitiveness of existing technology (Bimber, 1998).

A number of other empirical studies demonstrated the link of technology with firm competitiveness. These include Karima's and Stoever's (2010) comparative study on the role of technology and human capital in the EPZ life cycle aligned with Porter's Five Forces of competitiveness. It brought out the dominant role of technology from Transnational Corporations or new entrants whose outsourcing to EPZs across

continents heightens competition. This was ably demonstrated in the Asian Tiger economies and China as the key recipients of cross-border TNC partnerships.

Investment and distribution enhanced their productivity, innovation and competitive trade effects with the resultant impact of transforming their economies within a very short time (Karima & Stoeber, 2010; Blomström & Kokko, 1997; Omar and Stoeber, 2008). Mwakaje's (2010) study on the role of Information and Communication Technology (ICT) for Rural Farmers' Market Access in Tanzania and Ajay's (2010) review of FDI inflows into sub-Saharan Africa (SSA) confirmed that affordability and accessibility of technology facilitated technology applications by the less-endowed firms from developing countries. This has enabled firms in developing countries to compete through product quality, market outlets, skills factor productivity and efficient resource utilisation.

In contrast, the African Economic Research Consortium (AERC) (2006) study on the determinants of Foreign Direct Investment (FDI) in Africa found that irrespective of extensive reforms and adoption of conducive investment climates, FDI inflows into Africa were yet to be experienced. Further, the limited FDI inflows remained predominantly natural resource, market or efficiency-seeking investments (AERC, 2006). In addition, the negative perceptions about Africa discouraged many would-be investors who preferred lower returns in non-lucrative markets. This was demonstrated in Elbadawi's & Mwega's (1998) research on Kenya's FDI performance.

The World Bank's (2004) study on the cost of doing business in Kenya draws on Porter's Diamond, in rating political and macro-economic instability, infrastructure, justice, governance and sour donor-government relations as critical for FDI inflows (Asiedu, 2002). These challenges, according to UNCTAD (1999), justified a case for government intervention with measures to promote general or specific types of FDIs, if the developing countries were to be competitive.

The bulk of the impact of technology-related competitiveness research in Kenya had been done in the electricity and ICT sectors. In particular, the research concentrated on the liberalisation of energy generation and its impact on Kenya Power & Lighting Company (KPLC) performance and e-waste management (Korir, 2006; APF, 2008; Okello & Ndirangu, 2010; Mureithi, Wanjira, Finlay & Schlupe, 2008). Most of them drew on Porter's Five Forces and value chain theories in explaining the underlying principles of their competitiveness. Hidding, Williams and Sviokla (2011) demonstrated in their study that leadership and business cultures that emphasise partnerships of integration, in addition to competences, were significant in adoption of technology. Nevertheless, the studies were not categorical on why some leaders do not succeed even where the same competences are shared. This study seeks to establish the challenges of the Kenyan electrical and electronics sector in accessing more contemporary technologies supportive of the sector's competitiveness; in particular, aspects related to efficiencies in management operations with regard to communication systems and staff competences.

### **2.3.3 Innovation**

Through Porter's Five Forces of competition, industrial competitiveness can be achieved through either substitute products or new entrants that may also be responding to customer demands or chance events. The events at the national level can be catalysed by government interventions. These include incentives, establishment of support institutions and/or setting aside resources for Research and Development (R&D) in the case of developing countries. The innovation theories anchored on how change permeates both consumers and producers in a competitive environment (Appendix 10) and consisted of diffusion, open innovation and regionalism (Schumann, 2005; Ducker, 2002; Schumpeter, 1949; Campos, 2002). In the context of Porter's Value Chain, the diffusion theory according to Robinson (2009) was transmitted through peers and networks. This was different from the gravitational pull that takes into account environmental issues embedded in cultural factors and restrictions impacting on competitiveness (Callon, 1991; Latour, 1997; Robinson, 2009). This, however, does not take on board the challenges of a weak private sector and institutions; neither does it make provisions for power imbalances in networks such that partners in sustaining competitiveness are coordinated by a more powerful player.

Further, the chance events in the Porter's Diamond and the paradigm shift in open innovations, which allow for ideas to come from within and without, are not factored into competitiveness (Chesbrough, 2007). They also do not factor in the regional developments and locational theories aligned to the flexible global production arrangements enshrined in the competitive global value chains (Zook, 1997). In

addition, the theories do not also take cognisance of the Schumpeter (1928) and Solow (1956) PLC growth theories central to discontinuity and perpetual destruction in capitalistic economies that emphasise the role of markets in competitive behaviour.

In spite of the abundance of innovations arising from short-term patents, useful information may not be freely accessible due to limited technology outreach, staff competences or retention on account of company secrets. To this extent, competition may not be as widespread as theory suggests, even in instances where there are widespread open innovations.

The empirical studies on the impact of innovation on competitiveness of the electrical and electronic sectors (Appendix 11 and 18) highlighted liberalisation of the telecommunications sector in Kenya in 1999 as the turning point bringing to the fore a number of innovations that have transformed service delivery in different sectors. McCormick and Onjala (2007), through a combination of qualitative and quantitative methodologies, in their Economic Commission for Africa (ECA) research paper for selected SSA countries (inclusive of Kenya), confirmed ICT's revolutionary role in propelling Africa to leapfrog and join the league of emerging nations. They also acknowledged the challenges of human resource, R&D design competences, regulations and factor adaptability to changing value chains governing competitiveness in the present-day globalising environment. Unlike other internationally-traded sectors, the ICT sector has the unique potential to traverse the globe through market forces anchored on suppliers—labour intensive low technology or producers—technology-intensive-driven value chains (McCormick & Onjala, 2007; Gereffi, 1994: 2005). Producer-driven value chains have significant foreign direct investment, which

is characteristic of capital and technology-intensive industries with production processes dominated by outsourcing (Gereffi, 2005).

Africa's ICT manufacturing was still at the infancy level, thus missing out on participating in the outsourced industry production activities, the main determinant of competitiveness in the electric and electronics sectors (McCormick & Onjala, 2007). Value chain studies were limited and narrowly-focused, making it difficult for countries like Kenya to identify competitive segments from which to add value while linking with other members in the chain to enjoy prevailing competitiveness (McCormick & Onjala, 2007). While software development had picked up momentum in a number of African countries, Kenya included, gaps existed with regard to intensification of R & D on software design development and other relevant globally-competitive chains. There is need to intensify research in the ICT sectors given their cross-cutting impact on all disciplines of human endeavours—work, education, leisure, communication, production, distribution and marketing (McCormick & Onjala, 2007).

Anyasi's and Otubu's (2009) survey on the effect of mobile phone technology in the banking system, built on Porter's competitiveness theory, reiterated that, through innovation, there can be emergence of new products and services from unexpected quarters that can gain competitiveness. Mobile money, popularly known as M-Pesa in Kenya, was a new innovation, that diversified the application of existing technology to loop in populations that had hitherto not been banked (Anyasi & Otubu, 2009; Kubzanansky, 2011). These innovations, together with the adoption of Automated Teller Machines (ATMs), had heightened competition in the financial sector in Kenya.

In addition, the innovations have also assisted in mediating the convergence of social and economic divergences in society. In comparison, Filippetti's (2011) firm-level analysis of 5,000 European firms, on innovation modes and design, reiterated the centrality of design in R&D among clusters with cross-border interconnectivity, as contributors to innovations that underpin firm competitiveness. This type of model may not be directly applicable to developing countries, to which Kenya belongs, in which insufficient research on how to adapt new innovations to the local situations persists.

Sapprasert's (2006) study of Norwegian firms found that irrespective of the short Product Life Cycle (PLC) for substitutes, the level of ICT intensity in management contributed significantly to managing competition and intelligence monitoring for champions to remain at the top (Mackus, 2003; Kaczynski & Rufat-Latre, 2011). Similarly, Guimaraes' (2011) European-based study on industry clock speed's impact on business innovation success factors highlighted the key determinants of innovation success to include: strategic leadership, competitive intelligence and management of technology. In addition, it took into account the specific characteristics of the company's innovation process; in particular, the industry speeds at which new innovations are implemented. However, in the case of Kenya and other developing countries, a full complement of such competences may not exist. Worse still, research on technology innovation remains scanty in Africa (Filippetti, 2011). Consequently, this study in drawing on relevant experiences from the cases reviewed, addressed modalities of innovation, either through direct purchase or partnerships, promotion and branding and management roles in investment decision making. In particular,



attention focused on possible gradual changes in the upward movement along the value chain within the relevant sub-sectors in line with technology-and knowledge-intensity products and services (Haughton & Thorborn, 2004).

#### **2.3.4 Market Access**

The barriers to market access reviewed under Appendices 12, 13, 14 and 17 had, in the context of WTO and regionalisation, been substantially reduced to the extent that market access is increasingly being determined through entry strategies; besides competitive or comparative advantage, product and market differentiation (Porter, 1995; Ellis & Williams, 1995). The choice of such entry strategies depended on the principle motives of internationalisation; either to seek lower product costs, sales or exploit proprietary assets (Porter, 1985, 1998; Dunning, 1998). The equity-based strategies arose from establishment of subsidiaries, partnerships, mergers and acquisitions. Non-equity-based strategies took the form of exports (direct/indirect), contracting, licensing, franchising or management contracts (Ellis and Williams, 1995). The effectiveness of these market entry strategies are subject to government regulations and customer allegiance in destination markets, which can be prohibitive to new entrants.

Information logistics enhances management competences in integrating information in coordination, distribution and competitive intelligence for effective branding and competition (Sapprasert, 2006; Levy, 2007; Walley, 1998; Nasri, 2010). Information technology was important in facilitating innovation of new product designs, enhancing efficiency in processes, productivity and growth, delivery of services through the World Wide Web (Schumpeter, 1949; Gaur, Donselaar, Woensel, Broekmeulen,

& Fransoo, 2009; Sapprasert, 2006; Kotler & Armstrong, 2008) (Appendix 12). IT and the services industry drive the goods industry market access in the globalising scenarios (Sapprasert, 2006).

Most of the above studies were conducted in the developed countries. In the case of GVCs, they affect the pace at which businesses grow, create the opportunities for e-business beyond traditional boundaries and build knowledge asset as a source of competitive advantage (Porter, 1990; Schumpeter, 1949; Walley, 1998). Kenya's investment in information access infrastructure and architecture remains inadequate. This compromises the capacity of the firms to monitor competition and make timely transformational responses to contain the competitive innovations of a competitor. The Kenyan manufacturing industry is fairly rigid and has continued producing the same products regardless of the various substantial reforms that the government has embraced since the 1990s.

Further, first mover advantages associated with those enterprises undertaking regular and continuous research for product improvement to meet customer unique demands were prevalent among multinationals unlike the Kenyan SME-based industry. Born global companies, most often ICT-facilitated, through the convergence of technology and information systems, however, operated from anywhere on the globe to access the global markets (Gereffi et al., 2005; Levy, 2007; Baldwin & Gu, 2004).

Mwakaje's (2010) study on the role of information and communication technology for rural farmers' market access in Tanzania found that technology transfer for enhanced competitiveness through partnerships along value chain networks was feasible in

developing countries. Tanzanian rural farmers with minimal education adopted ICT to access market information on agricultural products. They ended up fetching, on average, higher prices than those of their compatriots who continued with traditional channels of information access. Nasab's and Aghaei's (2009) panel study concluded that countries investing in ICT experience competitiveness with resultant significant growth prospects. Similar experiences were reported by Jack & Suri, (2010) in the case of Kenya where ICT technology investment opened up new, more competitive spheres of economic activity.

Further, the Export Processing Zones (EPZs) in Kenya, like in other countries, have created opportunities for outsourcing. This has led to technology transfer and skills training, particularly in the textiles and apparel sector, which now competes in the global markets. This generalisation may not be applicable to all countries, particularly when the project life cycles (PLC) in the case of fashion are very short. Other challenges included the slow pace of the private sector in adopting e-business and e-business logistics. These IT-business-based platforms remain critical for transacting investment and facilitating trade with resultant effects on competitiveness.

For the purpose of this study, the export and contract entry strategies leading to off-shoring and outsourcing were explored in the context of trade in electrical and electronics products and services. The preferential market access opportunities coming with the entry of the African Growth and Opportunity Act (AGOA) in SSA in 2000 had no impact in the off-shoring of electrical and electronics investments and yet worked well for garments and textiles. This experience is not unique to Kenya. It depends on country motives and strategies for accumulation of investment. Malaysia,

Singapore and Thailand are countries whose government policies targeted foreign FDI and other countries (Korea and Taiwan) decided to develop local enterprises and autonomous innovative capability, relying on multinational firms mainly as sources of technology. The Kenyan government needs to borrow from such lessons and promote sectors critical in integrating into global value chains of the highly-traded products/services. There is also urgency in exploring the options of reviewing the policy environment to encourage and open up the Kenyan family-based ownership structure of the enterprises to partnerships. Other critical interventions include subscribing to global databases for the purposes of exposure.

A Nigerian study on the adoption of the internet and on-line services to facilitate provision of timely information and services shed some light on the global markets. The study findings confirmed that technology was a viable mode of entry into any part of the globe with consequent market competitiveness (Epetimehin, 2011). The success of M-Pesa in transforming Kenya's financial sector to reach and service large under-served segments of the population within a very short time further demonstrated this attribute [Kenya Bureau of Statistics (KNBS), 2007; Mas & Radcliffe, 2010]. The lack of appreciation of the emergent business operations of outsourcing in the power supply and flower distribution was an issue requiring serious attention (Kathure, 2010; Waithaka, 2010).

While one of the flagship projects in Vision 2030 was the establishment of Multi-Media ICT Parks and Business Process Outsourcing (BPO) services to enhance competitiveness of the Kenyan economy, there was need to undertake sector-wide research to establish market trends and positions taken by competitors [Government of

Kenya (GoK), 2007; the Kenya Investment Authority (KIA), 2008]. The electrical and electronics sector in Kenya should emulate these practices and invest more in logistics pertaining to the mode of operation at the global platform in order to participate in the GVCs determining competitiveness.

### **2.3.5 Operational Environment**

The operational business environment is a combination of economic, social and political factors that affect an organisation's activities. These act as moderating factors or exogenous third variables, affecting the zero-order correlation between two other independent variables. They are catalysts or inhibitors, in the form of organisational, technical or individual factors (Sun, 2006). More specifically, the operational environment is anchored on the organisational strategic management of labour in leveraging available resources, capabilities and competences that result in competitive advantage in line with resource-based management theories (Mintzberg, 1979). At firm level, resources and products are two sides of the same coin (Wernerfelt, 1984). Most products require the services of several resources and most resources can be used in several products. Barney's and Arikan's (2001) empirical assessment of 166 studies on Resource-Based Views (RBV) management validated the theory. Only 6 studies were inconsistent. This conclusion could be negated by the fact that the researchers oversimplified the analysis. Studies that did not return a significant test on the use of RBV were assumed to be inconsistent.

Further, a number of strategic management models impact on the operational environment. These include Lewin (1951) 3-stage management model of unfreezing (status quo) to identify if there is need for change, freezing (implementing change)

and re-freezing in order to institutionalise change. Efficiencies achieved from the changes in management lead to competitiveness. Kotter's change management model (1995) focuses on leadership as the critical ingredient for change. In this model, change is championed through a coalition of leaders; with at least 75% of the company's management buying into the change.

The ADKAR model is a goal-oriented management model that allows change management to focus activities on specific business results intended to help and coach employees through the change process (Prosci, 1998). This model aligns traditional change management practices by creating Awareness, Desire, Knowledge, Ability and Reinforcement.

The Economic and Organisational (E and O) theories of approach to change stress the need to manage the tension between economic (hard) and organisational (soft) approaches to crafting change. To thrive and adapt in the new economy, companies must simultaneously build up their corporate cultures and enhance shareholder value; the E and O theories of business change must be in perfect step (Beer & Nohira, 2000).

Resource-Based View (RBV) proponents assume stability in product markets and avoid determining resources' values. As a perspective for strategic management, imprecise definitions hinder prescription and static approaches relegate causality to a "black box" (Wernerfelt, 2006).

Knowledge management theories, on the other hand, are frameworks for designing organisational goals, structures and processes to create value for customers while

adapting to changes in the business environment (Dalkir, 2005; Sanchez & Mahoney, 1996). These are articulated in organisational visions or strategies, through assignment of roles to different structures including defining the tools and platforms through which value propositions can be delivered (Dalkir, 2005). However, these models do not acknowledge that changes at times may be too temporary such that adapting to change may throw the organisation out of balance. In employing Porter's (1985) Analysis Approach, Lee's and Yang's (2000) "Knowledge Value Chain" (KVC) identified infrastructure and process activity as two Knowledge Management (KM) components that enable a firm to provide valuable products and services to its customers. Holsapple and Singh (2001), on the other hand, advanced the Knowledge Chain Theory (KCT) to postulate that combined KM activities yield two kinds of organisational outcomes: learning and projections. These propositions constitute knowledge management theories, which benefit from firm visions and strategies.

With reference to the OLI theory, the moderating factors in the location-specific comparative advantage were embodied in economic, political and cultural structures and systems influencing firm choices in search of resources, low-cost labour, technology and market size (Dunning, 1998). In the context of the operational environment for electrical and electronics sector's competitiveness in Kenya, these were also contexted on Porter's Diamond with regard to government interventions and chance events. Such government interventions take the form of political, social and other non-market industry factors in form of firm culture and consumer tastes impacting on competitiveness (Porter, 1990; Zeithaml, Varadarajan & Zeithmal, 1988; Nasri, 2010; McCray, Gonzales & Darling, 2010; Levy, 2007; Sparks, 2010).

Firms that survived competition had invested in competitive intelligence infrastructures for effective management and prompt decision making whenever market conditions changed (Nasri, 2010; McCray et al, 2010; Sparks, 2010). Kenya's investment in information access infrastructure and architecture remained inadequate. This compromises the capacity of the firms to monitor competition so as to make timely transformational responses to the competitive innovations of a competitor. The Kenyan manufacturing industry was fairly rigid and had continued producing the same products regardless of the reforms and available markets. In this study, the moderating factors of interest were limited to the centrality of the government as an arbiter—in legal and regulatory frameworks, political and non-market activities in determining industrial competitiveness and decisions in business locations (Sparks, 2010; OECD, 2002).

#### **2.4 Conceptual Framework**

While scholarly definitions of conceptual framework depend on the subject under review, the theoretical literature review of the electrical and electronics manufacturing sector's competitiveness in a globalised environment prioritised competitiveness theories. These included Porter's theories on national, firm, value chain and generic competitive strategies, the Dunning Eclectic theory critical for industry location with a heavy bearing in the determination of electrical and electronics competitiveness (Trochim, 2006; Aguilar, 2009; McGrath, 2009). These took into account the factors impacting on efficiency, productivity and forward and backward linkages at national and international levels (OECD, 2007; Badri & Toure, 2010). In addition, the moderating factors underpinning the Kenyan electrical and electronics sector's

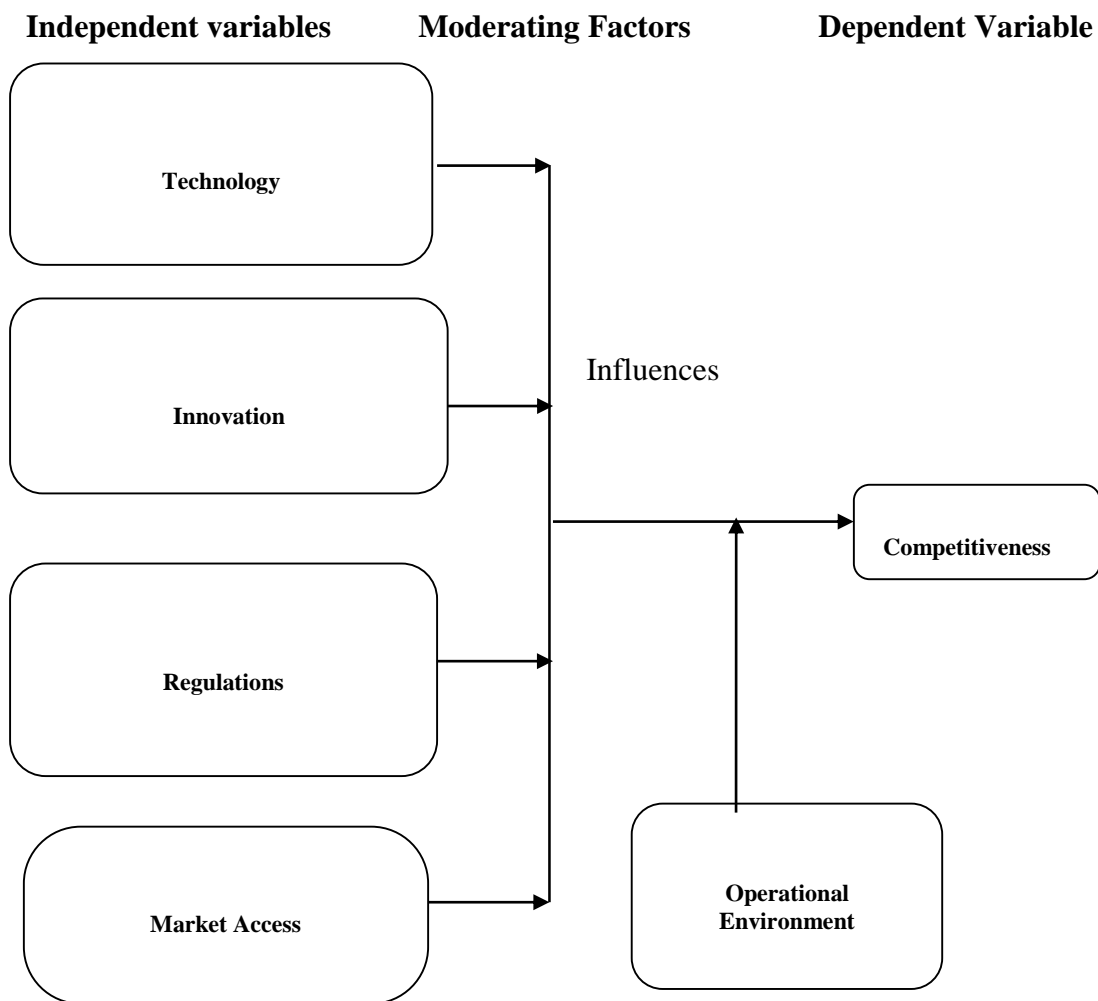


competitiveness covered the operational political and social environment and other non-market factors.

The conceptual framework presented in Figure 2.7 postulates the relationship of the independent and moderating variables on competitiveness. In particular, the role of innovation was in the agility of product quality and adaptability to customer needs. Technology focused on applications for least-cost production techniques. Product accessibility, on the other hand, was on the basis of market access entry strategies and logistics; while regulations were in the context of policy scenarios, rules and standards. The moderating effect of the operational environment took into account politics, culture and tastes in the business environment (OECD, 1992; Hart, 1992; Bulscu, 2011).

The manipulation of the independent variables to determine their relationships to the sector's competitiveness focused on identifying those factors defining the construct of Kenya's electrical and electronics manufacturing competitiveness. In the case of technology, it addressed factors impacting on technology adoption including source of information, management and operational competences. Innovation factors took into account the changing business environment, depth of research and development initiatives, adaptation of new innovation from direct purchase or MNC/TNC partnerships. Market access, on the other hand, focused on internationalisation of entry strategies and related support logistics. Market access also evaluated supplier/demand relationships including outsourcing, trade facilitation and support logistics.

Regulations targeted critical factors in form of rules, laws, standards for conducive business environment, investment partnerships within and across borders, suitability of regional and preferential trading arrangements as well as removal of barriers to trade for enhancing the electrical and electronics sector's competitiveness. The moderating operational environment underpinned the transmission mechanisms of the variables under consideration. This was anchored on political environment, governance, culture, tastes and perceptions of the different investors and other non-market related issues.



**Figure 2.7: Determinants of competitiveness of electrical and electronics manufacturing enterprises in Kenya**

## **2.5 Critique of Existing Literature Relevant to the Study**

While substantial research had been undertaken in the role of fragmented production systems in enhancing country and firm competitiveness in the developed and emerging economies, very little had been carried out in developing countries, Kenya included. Consequently, sector prioritisation for development in Kenya did not target emergent competitive segments with potential for participation in GVCs. Neither does it take on board the SME structure anchored on family-based ownership resistant to partnerships that create opportunities for modernisation.

Further, there was very little coverage of political and cultural aspects having major bearing on FDI flows into developing countries, thus limiting the possibility of learning from past experiences. There was an occasional mention of the role of SOE (OECD, 2000) interventions to mediate for competitiveness and yet China has excelled with continued government interventions in business. Better still, recent market failures (Enron in 2008 and the global financial crisis) occasioned by lack of regulations demonstrated the centrality of governments in moderating the business environment. The Asian Tigers' and China's successes draw heavily from direct government interventions in directing FDI flows to sectors of the economy with the highest impacts. There have not been extensive studies to establish the key inhibitors to leveraging freely open patents to strengthen local production systems. Studies on the impact of regionalisation on industry structures are also missing. Regional markets remain anchors of prosperity, given that over 70% of the global trade takes place within regional markets. There have been less than adequate studies on why the

private sector has not taken up opportunities coming with regional markets and special trading arrangements.

National visions are not anchored on research evaluating different options in the national, regional or global contexts. Instead, proposals from international institutions have often been implemented without adaptability to local conditions. The ramifications have been disastrous.

There was little by way of leadership roles in stewardship of economic activities. There was only one study reviewed, which acknowledged the role of management and human resource competences in influencing business decisions on either research or partnerships (Sapprasert, 2006). This was corroborated by the Hidding, Williams and Sviokla (2011) study on leadership and business cultures that emphasised partnerships of integration and competences as being significant in adoption of technology. Leadership roles in decision making in adapting production to changing consumer tastes remains critical in an environment where product shelf lives are very short. Adoptions of new technological developments are underpinned by management decisions.

## **2.6 Summary**

Globalization, technological advancements, economic and societal changes have become critical influences in competitiveness. Further, international trade is increasingly being driven by FDI location and off-shoring, making it possible to locate firms in any area of the globe. This has resulted in global networks facilitated through communication technology logistics that underpin sector competitiveness.

In the case of Kenya, this was expounded by the theoretical and empirical reviews undertaken to inform the choice of the constructs to the electrical and electronics sector study as summarised in Table 2.1. Given that the Kenyan electrical and electronics manufacturing sector is basically SME-based, the Dunning OLI theory complemented by Porter's Diamond and Value Chain models appear to be appropriate theoretical frameworks that can harness SME production structures in developing countries like Kenya, for enhanced competitiveness. KNBS (2012) and Magu (2011) reconfirmed the SME nature of the Kenyan electrical and electronics manufacturing structure. There had been minimal uptake of modern technology for production of the more competitive products desired by the market. In addition, vertically-integrated manufacturing was the prevalent mode of production among the Kenyan electrical and electronics manufacturing enterprises. Countries that had adopted fragmented production systems had transformed their economies within a short time. These include Morocco, the Asian Tigers and China.

**Table 2.1: Summary of the Theoretical Framework and Empirical Evidence**

Variable	Theories	Study Focus Issues	Empirical Evidence
Competitiveness	Porters Five Forces	<ul style="list-style-type: none"> <li>✓ Number of players</li> <li>✓ Product diversity</li> </ul>	Korir, 2006; Okello, Ndirangu (2010); and Mureithi, Wanjira (2008) studies on KPLC, e-waste management
	Porters Value Chain	<ul style="list-style-type: none"> <li>✓ Customer/supplier chain relationships</li> <li>✓ Location of the manufacturers in the value chain</li> </ul>	Afif (2009) Moroccan study on adoption of fragmented production
	Haines Customised Value Chain	<ul style="list-style-type: none"> <li>✓ Trade facilitating logistics</li> <li>✓ Supplier/buyer networks,</li> <li>✓ CT systems and websites</li> </ul>	Gibbon (2005), Gereffi (1994)-buyer/supplier driven chains
	Dunning Eclectic OLI	<ul style="list-style-type: none"> <li>✓ Suppliers/buyers relationship</li> <li>✓ Product location in the value chain</li> </ul>	Afif (2009) –role of fragmented Moroccan EE
	Porters Diamond	<ul style="list-style-type: none"> <li>✓ Economic, political and business environment factors</li> <li>✓ Firm management strategy</li> </ul>	McDade (2005) use of IT by new generation entrepreneurs to link into global economy
	GCI	<ul style="list-style-type: none"> <li>✓ Knowledge and technology intensity</li> </ul>	WB annual competitiveness studies
Technology	Clustering	<ul style="list-style-type: none"> <li>✓ Complementarity of support industries</li> </ul>	EPZ schemes Magu (2011) SME challenges in application of modern technology in production
	Structuralism	<ul style="list-style-type: none"> <li>✓ Rules and standards</li> </ul>	Hughes (1992) and Luhmann (2000) - Upgrading from existing technology
Innovation	Diffusion	<ul style="list-style-type: none"> <li>✓ Peers and networks</li> </ul>	R&D on new technological developments (Onjala & McCormick, 2007)
	Gravitation	<ul style="list-style-type: none"> <li>✓ Partnerships of peers and networks</li> </ul>	Liberalisation of the telecommunication sector
	Discontinuity	<ul style="list-style-type: none"> <li>✓ Frequency of new products</li> </ul>	ICT based innovations e.g. M-pesa, YouTube
Regulations	Market based	<ul style="list-style-type: none"> <li>✓ Agreements</li> <li>✓ Laws, standards</li> </ul>	National trade and investment legislations
Market Access	Globalisation	<ul style="list-style-type: none"> <li>✓ Entry strategies heightening role of partnerships</li> <li>✓ Agreements</li> <li>✓ regionalisation</li> </ul>	Mwakaje's (2010)-ICT facilitate Tanzania rural farmers market access
Operational environment	RBV	<ul style="list-style-type: none"> <li>✓ Resource diversity</li> </ul>	Newton (2008) location of FDI into USA post terrorist attacks Elbadawi, Mwega (1998) perceptions impact on FDI flows
	Knowledge management	<ul style="list-style-type: none"> <li>✓ Organisational goals and strategies</li> <li>✓ ICT networks</li> </ul>	Barney and Arikan (2001)

Some of the Kenyan industry players were not receptive to the new production and management processes aligned to globalise the business environment and anchored technology developments aligned to the Haines' and Porter's value chain theories or the knowledge management theories. For example, flower managers resisted the application of ICT procurement systems on existing suppliers but opted to discuss the same on new procurement arrangements with new suppliers. The limited synergy among ICT users and distributors reduced opportunities of e-waste recycling. The resistance can be explained, in part, by limited skill competences in the labour force. Further, the continued business outcry of unfair trade from counterfeits and contraband products has, in part, arisen from limited technical capacity to enforce WTO trade remedies. The Tanzanian rural farmers' adoption of ICT in marketing their produce led to improved incomes from better prices. Similarly, networked African new-generation entrepreneurs created opportunities for linkages to the global economy (McDade & Spring, 2005).

The Export Processing Zones (EPZs), nevertheless, have created opportunities for fragmented production processes through outsourcing. Thus partnerships in investment, trade and innovation are critical for both large and small firms that wish to withstand competition. They form the basis for fragmented production and off-shoring processes of locating businesses either in proximity to markets or factors of production. According to Braga (2000), ICT and e-commerce seamlessly network Small and Medium Enterprises (SMEs) participating in the fragmented production and off-shoring processes into the global economy (OECD, 2001; Carlson, 1975; Forsgren & Johanson, 1975; Welch & Wiedersheim-Paul, 1980). Thus, technology adoption,

innovation and market access draw heavily from the types of partnerships available. To the extent that regulations and related market requirements are standardised, partnerships are integral to the execution of such agreements.

There is a limit to market-based policy frameworks sustaining competitiveness. This is ably demonstrated through the recent market failures (Enron, Euro crises, etc.). These further heightened the need for continued use of regulations even in liberalised market environments. Market access is driven by internationalisation strategies, heightening the centrality of technology and innovation in the exploitation of available resources. In addition, R&D continuously feeds into the innovative process of product diversification to create variety for consumers and investors.

Limited research has been done in the electrical and electronics sector in Kenya, including its participation in the GVCs. In any case, very few of Kenyan firms subscribed to international databases that create opportunities for linkages and networks facilitating competitive entry into the global markets. Consequently, the benefits from effective participation in the supply/distribution chains are lost. This study evaluated the different contracting arrangements by the different stakeholders in the Kenyan electrical and electronics sector.

The operational environment, in which political structures were fluid, brings with it volatile policy scenarios. This reduces private sector confidence. There have been limited FDIs into Kenya. Those that have come concentrated in the low-technology, natural-resource-based industries. Kenya has the potential to move up the value chain



through off-shoring production systems. The learning curve could be a lot shorter if strategic partnerships with TNCs/MNCs are entered into.

Past Kenyan research on the electrical and electronics sector's competitiveness was limited to Kenya Power and Lighting Corporation (KPLC), ICT, e-waste management and energy generation. Nevertheless, studies from developed and other developing countries re-affirmed the role of off-shoring through appropriate value chains. The Asian Tigers, China and Brazil, Russia, India, China and South Africa (BRICS) have exploited off-shoring opportunities in textiles, electrical and electronics sectors among others, to grow their economies. Developed countries, on the other hand, have concentrated on the better-paying segments of research and design to partner with other destinations through off-shoring the remainder of the activities.

## **2.7 Research Gaps**

While substantial research on the electrical and electronics sector's competitiveness had been carried out in the developed world, there existed scanty research from the developing countries, Kenya included. From the literature review analysed and based on the parameters of the Global Competitiveness Index, with respect to developing countries, the outstanding research gaps are broadly defined in the context of the challenges in the design of strategies to address the non-participation of electrical and electronics manufacturers in developing countries in the global value chains and networks governing competitiveness.

Magu's (2011) research focused on the Kenyan SME sector adoption of modern technology methods in the manufacture of electrical and electronics products. The study concluded that there was lack of enthusiasm by the manufacturers to adopt new technology. This arose, in part, from the high cost of finance and utilities, and intense competition from imports. The key recommendations from the study prioritised improvement of the enabling environment through macro-economic interventions. Other recommendations included establishment of more deliberate technology-upgrading initiatives such as a national technology foresight programme and establishment of technology parks; and firm-level initiatives aimed at introduction of the more competitive products traded in the global market.

However, Mwakaje's (2010) study on the role of ICT for rural farmer's market access in Tanzania confirmed that technology transfer enhances both competitiveness and incomes. On the other hand, Kathure's (2010) case study on outsourcing some activities at the KPLC brought out the contradictions from management of loss of control and quality challenges. This led to missing out on the potentials of improving competitiveness through participating in a value chain. In cognisance of the increased use of ICT equipment, Mureithi's and Wanjira's (2008) study on e-waste management established the lack of synergy across the different stakeholders in the ICT industry in putting together e-waste recovery and recycling processes. The study concluded that there was need to craft a policy and a complementary legislative framework to enforce e-waste management.

Waithaka's (2010) study recorded resistance from flower managers on existing supplier involvement in strategic procurement in the flower industry. However, when new products are introduced, new suppliers can be involved in the formulation of the supply logistics. This, in effect, curtails market access and reduces competition in the industry. In spite of the available preferential market access within the EAC and COMESA RECs, EU-EPA and AGOA, Kenya's export penetration remained low, in part, from lack of competitiveness or limited product range.

McCormick and Onjala (2007) and Okello and Ndirangu (2010), separately acknowledged the limitations of human resource competences in areas of R&D for design and development of appropriate regulations to stimulate factor adaptability to changing value chains governing competitiveness in the present-day globalising environment. Further, value-added studies in electrical and electronics sectors were limited in Kenya (McCormick & Onjala, 2007).

Elbadawi's and Mwege's (1998) research on the critical factors inhibiting FDI inflows into Kenya confirmed the correlation between the operational environment in form of political and macro-economic instability as impacting negatively on investor confidence in Kenya. The above findings validate Filippetti's (2011) conclusion that research on technology and innovation was scanty in Africa.

From these empirical studies, there were critical gaps in Kenya's electrical and electronics sector. These were in the form of lack of firm-level policy frameworks conducive to technology-loaded FDI inflows to address productivity challenges. Others covered limited investment in innovation and the low value-added production.

Similarly, narrow export product mix and inadequate human resource competences in knowledge diversification and management limit options of exploring new and better options in product development.

Further, capacity constraints in formulation and enforcement of regulations aligned to fragmented and outsourced production processes are among the gaps identified in the Kenyan electrical and electronics sector. Other critical challenges are related to limited research on the role of politics, culture and intermediation of logistics in the present-day competitive environment. In particular, the challenge of lack of research on reasons for the handicaps in the leadership capacities; to leverage free intellectual patents, to diversify industrial activities. This had resulted in low FDI inflows into the SSA countries, which have remained low on account of the perceptions associated with political instability, business and cultural factors and limited investments in logistics. Besides, government interventions (incentives and regulations) in developing countries critical in the establishment of a conducive business environment were not only limited but also selectively targeted foreign investors. This explains, in part, Kenya's limited uptake of regional markets in spite of the many advantages of geographical proximity and cultural similarities.

The critical challenges of interest in this study focused on the role of technology, innovation, regulation and market access strategies in the electrical and electronics global competitiveness, while also considering the moderating effect of the operational environment.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

Research methodology, as an organised and systematic inquiry or investigation in search of answers to specific questions, was covered through research and sample design, population coverage and types of investigations (Kumar, 2005; Kothari, 2010). It describes the types of instruments and controls factored for data collection; sampling techniques and procedures; the level of data analysis of the variables against the hypothesis of the study (Kumar, 2005; Kothari, 2010).

This research was anchored on a deductive and positivist philosophical approach in which the independent variables of technology, innovation, regulations and market access impact on competitiveness of electrical and electronics manufacturing enterprises in Kenya through the moderation of the operational environment. The assumptions underlying this research are anchored on the convergence of technology and globalisation through production and consumption patterns. This is transmitted through knowledge and technology intensity in the competitiveness of electrical and electronics manufacturing off-shored across the globe in search of resources and markets.

#### **3.2 Research Design**

The research design for the purpose of this study was a plan, strategy and structure of investigation (Kerlinger, 1973; Kothari, 2010). Research designs are descriptive, correlational, experimental or meta-analytical. In this study, the choice of the research design was guided by past comparative studies reviewed and the research questions

under investigation. This study adopted a correlational survey research design to investigate the associations between the independent variables (technology, innovation, regulations and market access through the moderating variable—operational environment) and the competitiveness of the Kenyan electrical and electronics manufacturing sector (Levin, 2006; Lindell & Whitney, 2001). The suitability of the research design derives from the existence of few earlier studies to refer to. The focus was to gain insights and familiarity with basic details, settings and concerns of the Kenyan electrical and electronics manufacturing sector's competitiveness. This will also create the ability to make inferences on one-time observations from a variety of constructs within the existing environment. It does not call for measurement of change. This being so, it is impossible to infer causality. As such, researchers using this design can only employ a relatively passive approach to making causal inferences based on findings. Consequently, the recommendations from this study remain proposals.

The past studies testing the significance and investigating more than one construct used exploratory or correlational survey designs in establishing the behaviour of the constructs under investigation.

These included McDade and Spring (2005) networks of new generational entrepreneurs, which investigated the demographics, size and legal status of firms and membership in networks to assess impact on business growth. Afif's (2009) study on the implication of fragmented production of electrical components investigated the role of prices, trade facilitation, politics and markets. Magu's (2011) study focused on modern technology adoption trends of small and medium electrical and electronics

manufacturing enterprises in Kenya through the moderation of the macroeconomic environment.

This study attempted to establish the determinants of Kenya's electrical and electronics manufacturing competitiveness by generalising inferences from the sampled enterprises. For each of the independent variables, the survey through multiple questions, explored the impact of the constructs on the competitiveness of the electrical and electronics manufacturing enterprises in Kenya.

### **3.3 Population**

A population is the universe of individuals, events or objects having a common observable characteristic that conforms to a given specification in the target or accessible population (Mugenda & Mugenda, 2003; Kitchenham & Pfleeger, 2002; Borg & Gall, 2007). In this study, the target population consisted of a population of policy makers, manufacturers and facilitators. For purposes of establishing a more comprehensive population register of electrical and electronics manufacturers, the KNBS and KAM registers were merged. The target population of manufacturers consisted of electrical and electronics manufacturers countrywide. The trade-facilitating institutions consisted of policy makers and trade-facilitating institutions in both public and private sectors.

The accessible population consisted of the actual respondents from which generalisation of the population characteristics are to be estimated (Mugenda & Mugenda, 2003; Kitchenham & Pfleeger, 2002; Borg & Gall, 2007). In the case of this study, this consisted of electrical and electronics manufacturing enterprises employing

more than 10 employees and operating within Nairobi and its environs. The sample selection was limited to Nairobi and its environs because over 90% of the manufacturers operate from within Nairobi. In addition, the structure of the industry was SME-based with the majority of the firms concentrating in the manufacture of hardware and appliances. As such, a sample from the same population would be representative of the whole population. In the case of policy makers and trade-facilitating institutions, the purposeful sample was drawn from national institutions based in Nairobi.

The accessible population was drawn from the merged register consisting of electrical and electronic manufacturing firms within Nairobi and its environs and employing more than 10 employees. The policy-making government ministries in the sample were the ministries of Industry and Trade. The facilitating institutions from the public sector were the Kenya Investment Authority (KIA), the Export Promotion Council (EPC) and the Export Processing Zone Authority (EPZA). The private sector associations consisted of the Kenya Association of Manufacturers (KAM) and the Kenya Private Sector Association (KEPSA).

### **3.4 The Sampling Frame**

In the study, the sampling frame from which the source data was drawn was the KNBS register validated with the list of members of KAM's cluster of electrical and electronics enterprises for the year 2011 (Borg & Gall, 2007; Sapsford & Jupp, 2006; Rivers & Bailey, 2008).



### **3.5 Sample Design**

The sample design constituted of a framework that provided information on the target and final sample sizes, strata definitions, the sample selection methodology and method of estimation before data was collected from a given population. In this study, probability sampling was used in the selection of the representative sample. A stratified sample of KNBS and KAM members facilitated the selection of a representative sample for manufacturing enterprises while purposeful sampling was employed in the selection of policy-making ministries, trade/investment-facilitating institutions (OECD, 2003; OECD-Eurostat & the International Statistical Institute, 2003).

### **3.6 Sampling Technique**

Sampling can be probabilistic with equal opportunity for every unit in the population or non-probabilistic selection in which systematic sampling relies on a defined ranking order with selection of elements at regular intervals. A stratified sampling process, on the other hand, is based on population categories or strata of independent sub-populations from which individual elements can be randomly selected (Bartlett, Kotrlik & Higgins, 2001). The sampling technique employed in the study was a combination of stratified and systematic sampling of manufacturing firms employing in excess of 10 employees and operating from within Nairobi and its environs. This was due to the fact that most of the firms were of similar size with the likelihood of providing information that was characteristic of all other firms (Bartlett, Kotrlik & Higgins, 2001). All electrical and electronics manufacturing firms in the KNBS and KAM registers were ranked alphabetically before the systematic sampling was done.

In cases where sampled firms had closed down, the selection of the replacement firms used the same systematic selection process. However, purposeful sampling according to Patton (2002) was adopted for the segments of policy-making institutions and private sector associations, since the players are only a few. Practitioners and professionals in this field were consulted before the final methodology of the sample selection technique of stratified sampling was settled on.

### **3.7 Sample Size**

While generally, the larger the sample, the more representative the scores on the variables were with regard to the population scores, researchers, as a rule of thumb, recommend a minimum sample size of 15 in experimental/exploratory research, 30 in correlational research and 100 in survey research (Borg and Gall, 2007; Scott & Wild, 1986; Lenth, 2001; Adèr, Mellenbergh, & Hand, 2008). A minimum sample size of 10% for large populations or 20% for small populations is considered adequate for descriptive surveys (Gay & Diehl, 1992). However, softwares can assist in sample determination and power and precision including *nQuery Advisor* taking into account the level of accuracy required in the applications of the results (Elashoff, 2000; Hintze, 2000; Borenstein, Cameron & Gilbert, 1997; Lenth, 2001).

In the case of this study, and in line with Gay's & Diehl's (1992) proposition of the adequacy of a 20% sample in small populations, a sample of equal proportion of 30% drawn from the KNBS and KAM alphabetically ranked registers for the manufacturers served the purpose of the survey; while that of the facilitators was purposeful. Consequently, a sample of 23 respondents consisting of sixteen (16) manufacturing enterprises, two (2) ministries, two (2) private sector associations and three (3)

parastatals formed the basis of the study group (Table 3.1). The KNBS and KAM registers were not stratified according to use or any other method. The analysis, therefore, combined both electrical and electronics manufacturers.

**Table 3.1: Sample Selection and Sample Size**

<b>Frame</b>	<b>Population</b>	<b>Firms with 10+ Employees</b>	<b>Selected Sample</b>	<b>%</b>
KNBS less KAM List	41	15	5	30%
KAM	35	35	11	30%
Total manufacturing firms	76	51	16	30%
Ministries	2	2	2	100%
Parastatals	3	3	3	100%
Private sector associations	2	2	2	100%
<b>Total sample size</b>			<b>23</b>	

(Source: KNBS 2011; KAM, 2012)

### **3.8 Research Instruments**

In line with the objective of the study, the research questions explored the effects of technology, innovation, regulation and market access through the operational environment in Kenya's electrical and electronics sector's competitiveness. A likert-based research questionnaire was used for data collection from the target population in the study. This was complemented with open-ended questions. The questions mirrored the key issues of the independent variables as discussed in Chapter 2 (Kitchenham and Pfleeger, 2002; and Chaudhuri, Mukhopadhyay and Ghosh, 2010). Three different sets of questionnaires targeting manufacturers, policy makers and trade-facilitating institutions were used in data and information collection (Appendices 2, 3 and 4).

The research instruments relied heavily on a combination of similar instruments used by Afif (2009), the Australian Electrical and Electronic Manufacturers' Association

(AEEMA) study (2009) and Okello and Ndirangu (2010). Additional comparative information was obtained by aligning the electrical and electronics sector's performance with strategic national policy changes that include regionalisation, liberalisation and privatisation. The questions brought out strategies employed in cost, leadership and differentiation as well as partnerships with international providers to widen product range and possible catchment. Further, discussions were held with policy makers in trade and industry to ensure that the issues under investigation reflected their true needs.

The key questions on the competitiveness of the electrical and electronics manufacturing enterprises sought information on export performance through sales and purchases and source and destination markets by type of trading arrangement—contractual, outsourced, agency or vertical integration—with a view to establishing if any of the local companies were part of the electrical and electronics global value chains. The analysis attempted to establish the factors inhibiting the upward movement of firms along the value chain.

Regulation questions determining the impact on electrical and electronics enterprises' competitiveness were those directed at the public sector aimed at bringing out the impact of trade and investment regulations, macroeconomic management, trade and industrial regulatory frameworks, governance, and incentive systems. There were also industry questions that solicited responses on partnerships and off-shoring and outsourcing policies with regard to business performance as well as challenges in the business environment with a view to establish areas of possible policy reforms beyond those of regional and global integration. The regulation questions were intended to

measure the impact of internationalisation, regionalisation, global paradigm shifts and government reforms on the performance of the electrical and electronics sector in Kenya.

Technology questions focusing on the effect of the electrical and electronics sector's competitiveness aimed at determining the level of partnerships for purposes of accessing FDI, investment in product development for access of external markets and strategies for technology modernisation; and adoption of modern distribution systems and participation in fragmented production within the global value chains. This was to show the extent to which the Kenyan electrical and electronics manufacturing enterprises had utilised the available strategies of direct purchase, partnerships or off-shoring to access modern efficient technologies to enhance firm efficiency and, hence, competitiveness.

On the other hand, innovation questions took into account knowledge sharing and learning practices, modalities of responding to changing consumer tastes, level of Research and Development (R&D) for continuous renewal, e-business operations and development of human capital to bring new ideas and the level of effort to differentiate products in the market.

Market access questions explored the means adopted by electrical and electronics manufacturing enterprises for entry into the regional and global markets while taking into account government regulations. These included participation in the value chain, off-shoring and use of IT-facilitated business logistics. A number of open-ended questions allowed enterprises to highlight the most supportive or constraining

regulations and make proposals on how the same could be reformed for positive impact on the industry. Further, queries were sought on whether benchmarking international best practices had facilitated conformity or there was need for any changes to business operations. IT-related questions focused on the type of IT used by the different players, and in particular how the same is networked to platforms, to ensure information access.

The moderating questions on the effect of the operational environment on the electrical and electronics manufacturing sector's competitiveness concentrated on the role of the government in the business environment—covering politics, security, culture, governance and consumer tastes and non-market issues among others. Empirical evidence was drawn from Okello's and Ndirangu's (2010) study and Global Competitiveness Reports.

The professional support of the supervisors was sought at all times to ensure the suitability of the survey instrument. The questionnaire was administered to Chief Executive Officers (CEOs) and senior technical staff through mail, with personal follow-up interviews to improve both the response rate and the quality of responses.

### **3.9 Data Collection Procedure**

For the purpose of this study, a mixture of mail and one-on-one interviews were adopted for primary data collection. Data from the secondary sources was obtained from local and international data sources and was used for benchmarking the outcomes of the findings from the primary data. This was to establish sector

performance against policy changes, technology uptake, trying out new innovations if any and the impact of regional integration.

Primary data was collected from the sampled respondents using questionnaires. The unit of observation and analysis was the management for both the manufacturers and facilitators. The questionnaire combined likert with open-ended questions to solicit views from the respondents. Discussions were held with a KAM electrical and electronics chapter and ministries of Trade and Industry to obtain insights into the sector as well as validating the survey instrument. Training of carefully-selected interviewers preceded data collection.

Further, a survey supervisor was in charge of a number of interviewers, and coding clerks cleaning and validating all the questionnaires for consistency before data capture. The researcher, in consultation with the supervisor, also reviewed the data at different stages during collection and analysis.

### **3.10 Pilot Test**

A pilot test was carried out to validate the integrity of the questionnaire and amend as appropriate the field time allocation and also the representativeness of the population was done before the full survey [Project STAR, 2008; Advertising Standards Authority (ASA), 1997; Oksenberg, 1991; Presser & Blair, 1994]. This ensured that the field staff had a common understanding of the instrument and guidelines provided alongside the questionnaire. As a rule of the thumb, 1% of the sample, at most 3 manufacturing firms from the non-target sample, constituted the pilot test. The pilot subjects were not included in the final study to avoid fatigue (ASA, 1997; Schewarz &

Sudman, 1996). The questionnaire and field work approach was reviewed to align with recommendations from industry players, which advised on interviewing as the preferred mode of data collection.

### **3.11 Data Processing and Analysis**

Prior to data processing, data was undertaken through data cleaning during the coding process. In cases where there was missing data, replacement was undertaken using the “Missing Values Analysis” add-on models in the SPSS package containing the estimation methods for replacing missing values. This was to ensure completeness and quality of data for meaningful analysis (Mugenda & Mugenda, 2003; Kothari, 2004). Finally, reliability and validity tests were carried out to validate the quality of the instrument prior to detailed analysis. The analysis consolidated the findings from the electrical and electronics sector.

The choice of the SPSS package was informed by the availability of the software, and the wide range of analyses, data presentations and tests that it can perform. These included descriptive statistics, graphics and scatter diagrams, and qualitative regression analysis including quality control and inferential tests. The software worked well with interval data on a nominal scale. More specifically, the inferential tests covered estimation of correlation coefficients, coefficients of determination ( $R^2$ ), ANOVA and Fisher’s F-tests of the whole model.

The choice of the multiple regression analysis was on account of the multiple independent variables under investigation and impacting on the competitiveness of electrical and electronic manufacturing enterprises in Kenya. The choice of ANOVA



was to assist in comparing the differences between the variable means to determine statistical significance of their association in the competitiveness of the electrical and electronics manufacturing sector. The statistical significance of the measures under investigation were measured by p-value for each variable and F-test for the whole model.

A number of empirical studies on electrical and electronics sectors in emerging and developed economies employed regression analysis in determining the effects of the different variables on sector competitiveness. Newton's (2008) study on factors affecting location of FDI in the USA post the September, 2001, terrorist attacks, used Ordinary Least Squares (OLS) regression methodology in analysing the effect of resources, economic stability, political stability and consumer demand in establishing factors affecting FDI location. Asiedu in 2002 carried out a regression on the role of the Growth Domestic Product (GDP), trade openness as approximated by liberalisation, market size and political stability to establish the key factors stimulating FDI inflows into Africa.

Since the study under investigation was exploratory, estimating the contributions and impact of the different variables, a multi-linear regression model was the preferred mode of analysis. With the guidance of the supervisors and professionals in this field, complementary analysis using ANOVA was carried out to establish the significance of the independent variables on the dependent variable.

### **3.11.1 Validity**

The validity of qualitative research was to determine whether the research truly measured that which it was intended to measure or how truthful the results were (Patton, 2002). It was the degree to which data collection techniques or analysis procedures yielded consistent findings; and thus, confirming that the results obtained from the analysis of the data actually represented the phenomenon under study (Borg & Gall, 2007).

In order to ensure that the final results of the research were relevant to the constructs under investigation, the study drew heavily from past similar researches. In addition, wide consultations were held with professionals and supervisors for quality control and validity of the instruments (Mugenda & Mugenda, 2003; Miller, 1986; Nunnally & Benstein, 1994). Based on the consultations, the questionnaire was amended as appropriate to enhance its validity. The instrument ranked responses (with a rating scale of 1-5) in the questionnaire against items and key issues in relation to the research objectives.

In this study, the Principal Component Analysis, in the factor analysis, was used to reduce the larger set of items under each variable to a smaller set that still contained most of the information while accounting for most of the variance. Inspection of factor loadings revealed the extent to which each of the variables contributed to the meaning of each of the factors (Kothari, 2008). Different threshold recommendations have been advocated by different scholars. The Jeromy's rule of thumb recommends a loading of 0.40 given that a loading below 0.10 was extremely low; between 0.11 - 0.20 was very low; between 0.21 - 0.40 was low. Anglin, Hser and Grella (1997) and Anglin,

Rutherford and Springer (2003) recommended a loading of between 0.41 - 0.50. Newman and Patel (2004) and Newby, Weismayer, Akesson, Tucker & Wolk (2006) considered a minimum threshold of 0.5 as acceptable. Henson and Roberts (2006) recommended a threshold of 0.6 or 0.7. In line with the latest recommendations of Henson and Roberts, therefore, a threshold of 0.7 upon rounding off was set for this study.

The findings from the validity tests are presented in the sections where the variables are discussed in this study report. The respective coverage sections are 4.4.1.3, 4.4.2.1, 4.4.3.1, 4.4.4.1 and 4.4.5.1. This allowed for aligning further analysis with the reduced factors meeting the threshold loadings.

### **3.11.2 Reliability**

The reliability of the instrument, as an indication of its stability and consistency with which it measured the “goodness” of a measure, was carried out in three critical aspects of the research protocol (Miller, 1986; Sekaran, 2003). These were the equivalency of the amount of agreement between the research under investigation and past similar researches, stability of similarity of scores with repeated testing of the same group of respondents and the internal consistency of the instrument measuring the same thing. Internal consistency of the homogeneity of the items in the instrument was examined through the inter-item consistency reliability and split-half reliability tests using a multipoint-scaled Cronbach’s coefficient alpha (Cronbach, 1946). Cronbach’s tests ranging from zero to one were used to describe the reliability of factors extracted from questions with two possible answers and/or multi-point formatted questionnaires or scales (Kothari, 2008). These were carried out prior to the

analysis of both independent and dependent variables. A minimum reliability coefficient of 0.7 according to Kothari (2008) confirmed the reliability of the instrument.

The higher the coefficients, the better the measuring instrument. Reliability, though necessary, is not a sufficient condition of the test of goodness of a measure. However, validity ensures the ability of a scale to measure the intended concept (Sekaran, 2003). Table 3.2 presents the results of the reliability analysis for this study in which all the coefficients for the variables were greater than 0.7. These findings corroborated the position adopted by Kothari (2008) and Sekaran and Bougie (2009). Therefore, the research instrument was reliable.

**Table 3.2: Reliability Analysis**

<b>Variable</b>	<b>Loadings</b>	<b>Cronbach's Alpha</b>
Competitiveness	29	0.744
Technology	8	0.841
Innovation	36	0.762
Regulations	16	0.701
Market Access	38	0.876

### **3.11.3 Specification of the Econometric Model**

A multivariate linear regression analysis model was employed in the analysis to establish the effect of the independent variables on sector competitiveness. Since there was a moderating factor, regression analysis was carried out at two levels. The first level (reduced) was carried out without the moderating factor while the second (full) model was carried out taking into account the moderating variable. The aim was to

test whether the moderating variable improved the strength of the independent variables on the dependent variables. The model took the following forms:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon \dots\dots\dots 1 \text{ (Full model, f)}$$

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon \dots\dots\dots 2 \text{ (Reduced model, r)}$$

Where  $Y = \text{Competitiveness}$

$\beta_0 = \text{Constants}$

$\beta_i = \text{Slopes of the variables}$

$X_1 = \text{Technology}$

$X_2 = \text{Innovation}$

$X_3 = \text{Regulations}$

$X_4 = \text{Market Access}$

$X_5 = \text{Operating Environment}$

$\epsilon = \text{error term}$

However, because the variables solicited data from a number of responses in which choices were made from a number of options, the grouped responses were weighted for each of the questions at firm level before coding and subsequent analysis. The full model incorporated the effect of the moderating factor—the operational environment. The goodness of fit tests of the two models established whether the moderating factor improved the performance of the model.

### 3.11.4 Data Analysis

Data analysis entailed transformation, synthesis and interpretation of data collected from primary and secondary sources. For the purposes of this study, a triangulation methodology was employed to determine the effect of the moderating variable on the

electrical and electronics sector's competitiveness (Denzin, 1978). This was complemented with the quantitative data from secondary sources and primary data from the survey. The qualitative data obtained through the questionnaires was processed and analysed through both quantitative and qualitative methods using the Statistical Package for the Social Sciences (SPSS) version 20.0 computer software (Saunders, Lewis & Thornhill, 2003). In addition, value chain mapping in linking the different stakeholder raw material sources, intermediary production processes and final product export destinations assisted in determining whether there were dominant producer and supplier anchor participants in the chain as well as viable clusters for lining into the GVCs (Gereffi, Humphrey & Sturgeon, 2005). This provided a validation process to determine the measures of the phenomena of fragmented production or off-shoring and outsourcing in Kenya (Denzin, 1978). Since a number of variables including the moderating variables acted collectively on competitiveness of the electrical and electronics sectors, a multivariate econometric model, through application of a two-stage regression analysis—consisting of the full and the reduced equations—was used in analysing the impact of the independent variables on the dependent variable.

#### **3.11.4.1 Qualitative Analysis**

From the empirical studies in Appendix 19, the majority of the researches from developed and emerging economies employed descriptive analysis on establishing non-numerical relationships of the contributions of institutions, policies and productivity to competitiveness (Omar & Stoeber, 2008; McDade & Spring, 2005; WEF, 2011; Mas & Radcliffe, 2010; Cantwell, 2003; OECD, 2000; Ng'ang'a, Kosgei

& Gathuthi, 2009). The few Kenyan studies, which concentrated in price advantage, also employed descriptive analysis (Kathure, 2010; Waithaka, 2010; Moreish & Wanjira, 2008; Okello & Ndirangu, 2010). Mas and Radcliffe, Bill and Melinda Gates (2010) M-Pesa innovation-based study, through comparative and graphic analysis, demonstrated the impact of policy liberalisation, which gave birth to alternative financial service delivery for the unbanked in Kenya.

This study applied qualitative analysis on the categorical sections of the questionnaire to determine the respondents' views on the key determinants of each variable, and their collective comparable contributions to the dependent variable. Frequency distribution graphics determined the mean, average and standard deviation where appropriate. Qualitative data analysis software packages for coding, annotating, retrieving and analysing small and large collections of documents and images were used to analyse the data obtained from the field.

#### **3.11.4.2 Quantitative Analysis**

Using the SPSS package, the responses to the likert questions were weighted to transform them into quantitative data. Validity, reliability and normality tests were carried out to establish the effectiveness of the instrument, content and reliability of the sampled population before running regression analysis on a full and reduced model to establish the contributions of the independent variables on competitiveness. The GCI for Kenya acted as a proxy for benchmarking competitiveness of the sector and variables under study.

A few studies employing rigorous regression analysis and associated significance tests in Appendix 19 included both simple and multi-level regression analysis with significant Chi and t-tests and confirmatory factor analysis (Blomström & Kokko, 1997; Bennet & Rahman 2008; Tyutyunov, Senina & Arditi, 2002; Newton, 2008; Meng & Minogue, 2011; Gaur, S., Vasudevan & Gaur, V., 2009; Nasri, 2010). As mentioned earlier, the few cases of the Kenyan studies that concentrated in price advantage employed descriptive analysis (Kathure, 2010; Waithaka, 2010; Mureithi, Wanjira, 2008; Okello & Ndirangu, 2010).

### **3.11.5 Analysis of the Variables**

The study employed regression analysis to establish the contributions and significance of the relationships of the independent variables under investigation to competitiveness of the electrical and electronics manufacturing enterprises in Kenya.

#### **3.11.5.1 Analysis of the Dependent Variable – Competitiveness**

The analysis of the dependent variable—competitiveness—was carried out through the comparative trend of the Global Competitiveness Index (GCI) in the secondary data and the qualitative analysis of the primary data from the survey. The proxy variables in the GCI aligned to the study variables are presented in Table 3.3. These are technology readiness, innovation; goods market efficiency, business sophistication and macroeconomic framework. Out of a maximum of 7 points, with 7 as the measure of best competitiveness, the results in Table 3.3 (based on the GCI secondary data covering the period 2009-2014 for Kenya) indicate that technology readiness (though on an upward trend) is low, and ranked below 50% of the more competitive markets. Market efficiency and regulations effectiveness were at a maximum of 60%.



Though Kenya ranked favourably among the top one-third countries in innovation, the scores were less than 50%. There were substantial variations in the macroeconomic frameworks making the operational environment unstable. The primary data analysis results were benchmarked against the results of the secondary analysis to establish the consistency of the electrical and electronics manufacturing enterprises' rating of the business environment with the global assessment.

**Table 3.3: Ranking of the Competitiveness Proxies against the Independent Variables**

<b>GCI Indicator</b>	<b>Research Indicator</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Technology Readiness	Technology	2.88	2.99	3.3	3.3	3.27	3.36
Innovation	Innovation	3.52	3.41	3.40	3.40	3.41	3.56
Goods market efficiency	Market Access	4.12	4.09	4.10	4.10	4.10	4.21
Business sophistication	Regulation	4.21	4.18	4.00	4.10	3.96	4.09
Macroeconomic framework	Operating Environment	4.37	3.43	3.40	4.00	3.39	3.64

(Source: Annual GCI Reports, 2008/9-2013/14)

In the primary data, competitiveness was estimated through qualitative analysis of the level of imports/exports of the different product categories within the regional and global markets. In addition, stakeholder knowledge levels on GVCs were investigated to establish whether stakeholders in the electrical and electronics sector appreciated the paradigm shifts in the industry. Additional analysis was also done with respect to staff competences, suitability of the business environment and the challenges inhibiting sector competitiveness. The key estimators derived included means, averages, proportions and standard deviation.

Enterprises engaging in vertical production systems were assumed to be uncompetitive in the current fragmented production structures. Information on change of product composition of the manufacturers as well as key contributors facilitated the determination of the manufacturing processes as well as adding value by moving up the continuum of the electrical and electronics products.

The questionnaire soliciting for information on competitiveness had reflected on source/destination of purchases and sales, partnerships and source of competition. The proxy measures that approximated competitiveness included export performance, value addition, type of business partnerships and fragmented production processes. Through reduction measures, weighted averages of the responses to the subcomponents of competitiveness were analysed. In carrying out significance tests at specified levels of significance, it was possible to estimate the suitable level of competitiveness for benchmarking the survey findings (Newton, 2008).

#### **3.11.5.2 Analysis of Independent Variables**

The analysis of the independent variables proceeded with the estimation of the variables using parametric methods. Each independent variable was analysed separately while holding other variables constant to establish their individual contributions and significance on the dependent variable—competitiveness.

From the studies reviewed, Analysis of Variance (ANOVA) was the most frequently used mode of analysis and testing of constructs under study. This was corroborated by Blomström's and Kokko's (1997) ANOVA analysis to determine the role of technology transfer embedded in FDI flows and portfolio investment of MNCs'

efficiency and productivity; impacting on competitiveness. Bruno and Campus (2010) and Omar and Stoeber (2008) employed ANOVA analysis in expounding on the impact of technology in productivity enhancement. Mas and Radcliffe, Bill & Melinda Gates (2010) used qualitative descriptive analysis to demonstrate the impact of technology on competitiveness in the services sector. Cantwell (2003) used ANOVA to bring out the dynamic role of technology in efficient resource allocation; generating higher profits and increased market share locally, regionally and globally. Since this was a one-off survey, regression and ANOVA analyses were employed in establishing the factor contributions of the independent and moderating variables in the competitiveness of the electrical and electronics sector in Kenya.

Factor analysis of the independent variables—technology, innovation, regulations and market access—preceded regression analysis in the estimation of variable contributions to competitiveness. An estimate for each independent variable, holding other variables constant, was made to determine their individual contributions to the dependent variable. These were complemented with ANOVA analysis leading to the coefficient of determination to establish how much each of the variables explained competitiveness. Then the gradient coefficients estimated the impact of the independent variables on competitiveness. The measures for mean, range, standard deviation and variance were obtained from the primary data. These gave an indication of the respondents' rating of the items and their suitability in approximating the constructs under study (Sekaran, 2003). Regression analysis of the full and reduced model validated the estimates obtained under the individual independent assessments to validate the suitability of the model used in the estimation process.

In the case of the moderating variable—operational environment—qualitative analysis assessed the impact of the economic, political and business environment on the electrical and electronics sector's competitiveness. However, its quantitative effect on the sector's competitiveness was assessed through the regression of the full and reduced models.

### **3.11.6 Testing**

The testing for the independent variables consisted of data reduction strategies, which included testing each combination of variables for correlation through the use of Pearson correlation coefficients and selecting the combination that exhibits the least amount of co-linearity among the independent variables (Newton, 2008). Another study had used the Generalised Method of Moments (GMM) in the analysis and estimation of coefficients from Colombian data sets (Fernandes & Isgut, 2005).

In the case of this study, the tests for the goodness of fit of research instruments were done through the reliability and validity of the model and associated measures. Further, normality tests established whether the sample was drawn from a normal population. The findings from the qualitative analysis of competitiveness were benchmarked against the GCI trend series for Kenya.

Significance tests on each of the independent variables were carried out at 5% level. The tests on the moderating variable included those of multi-collinearity. The final stage of data analysis was the testing of the hypothesis on the impact of the independent and moderating variables on the competitiveness of the electrical and electronics sector. In relation to the hypothesis developed, the t-test was used to

establish the impact of the independent variables, to establish if the perceived hypothesis held or not. Other tests carried out on the variables included: correlation, coefficients of determination and measures of goodness of fit and F-tests for model stability. In testing the significance of the variables on the electrical and electronics sector's competitiveness, the overall effect was that of testing the suitability of the whole model, using the F-tests of significance.

The corresponding formulae for these significant test measures are shown below:

$$\text{t-tests for the different independent variables: } t_i = \frac{\beta_i}{\text{se}(\beta_i)}$$

$$F = \frac{(\text{SSE}_r - \text{SSE}_f)/k}{\text{SSE}_f/n-k-1} \text{ where } n = \text{sample size, } k = \text{moderating variables}$$

$$F_{\text{crit}} = F(k, n-k-1) \alpha \text{ and } \alpha \text{ is the level of significance}$$

### **3.12 Operationalization of the Analysis of the Variables**

In establishing the role and significance of the independent variables (technology, innovation, regulations and market access) through the moderating factor—operational environment—on the Kenyan electrical and electronics sector's competitiveness, the reporting of the research findings was carried out at three levels. These consisted of presentation of the raw data, supporting literature and implications of the results. The analysis concluded with the significance of the contributions of the independent variables to the dependent variable.

The analysis was underpinned by quality control consisting of validity, reliability and normality tests of the sample responses to ensure the instrument used was reliable and

that the survey sample came from a normal population. This was followed by factor analysis in the identification of the items with the highest impact on the independent variables. These were subjected to further analysis. The qualitative and quantitative analysis incorporated inferential statistical tests on the significance of the contributions of the independent variables on the competitiveness of the electrical and electronics manufacturing enterprises in Kenya.

The data analysis and presentation of the results reflected the three types of questions in the data collection instrument. The 5-scale likert questions were subjected to factor analysis to identify the items with the highest impact on the variable under investigation. The open ended, 'Yes/No' and time/quantity questions were not subjected to factor analysis but were analysed qualitatively. All the responses on the three sets of questions were subjected to qualitative analysis by item and quantitative analysis collectively at variable level. At all these levels, validation of the linkage to the strategic objectives was monitored. Regression and ANOVA analyses facilitated in testing of the significance of the independent variables on the competitiveness of the electrical and electronics manufacturing enterprises in Kenya. The full and reduced models were subjected to partial correlation analysis to validate the role of the moderating variable in the effectiveness of the independent variables on the competitiveness of the electrical and electronics manufacturing enterprises in Kenya. In addition, the VIF tests were carried out on the whole model to establish the extent of multi-collinearity among the independent variables. The analysis of competitiveness was benchmarked on the Global Competitiveness Index.

## **CHAPTER FOUR**

### **RESEARCH FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

The study set out to establish the determinants of the competitiveness of the electrical and electronics manufacturing enterprises in Kenya. The sector's competitiveness is dependent on technology and knowledge intensity. More comprehensive analysis on the contributions of the independent variables—technology, innovation, regulations and market access—on the sector's competitiveness was analysed in the context of their direct and collective roles and through the moderating effect of the operational environment. The net effect was establishing the potential of the independent variables in spurring the strategic fit of the electrical and electronics sector's integration into the global value chains, which determine the present-day electrical and electronic sector's competitiveness.

The private sector respondents comprised of electrical and electronics manufacturers and support associations, namely: the Kenya Association of Manufacturers (KAM) and the Kenya Private Sector Alliance (KEPSA). The public sector respondents consisted of the policy-making ministries of Trade and Industry; and the trade/investment-facilitating institutions consisted of the Export Promotion Council (EPC), the Export Processing Zones Authority (EPZA) and the Kenya Investment Authority (KIA).

For each variable and to the extent feasible, data analysis and presentation was carried out for the three categories of respondents in the public and private sector, namely: manufacturers, policy makers and facilitators. This chapter presents details on the data analysis, interpretation and discussion of findings and implications thereof.

## **4.2 Study Preliminaries**

The preliminary findings reflected on response rates, industry characteristics, structure and performance.

### **4.2.1 Response Rate**

Out of a stratified sample of twenty-three (23) respondents, of which sixteen (16) were in actual manufacturing and seven (7) in different forms of facilitation, thirteen (13) private sector manufacturers and all the seven facilitators responded, culminating in an overall response rate of eighty-seven percent (87%) (Table 4.1). While acceptable mail survey response rates typically fall between 30-50% (LoDico, Flower & Quinn, 2006), according to Gay (1992) and Dennis (2003), a response rate of 30% was adequate for descriptive research surveys targeting the commercial sectors. Babbie (1990) and Mugenda and Mugenda (2003) suggested response rates of 60% as being good while 70% is very good. Based on these assertions, the response rate of 87% for this cross-sectional survey study provided a firm basis for making inferences on the whole population.



**Table 4.1: Response Rate by Public and Private Sector Categories**

<b>Respondents</b>	<b>Questionnaires issued</b>	<b>Returned</b>	<b>Response rate</b>
<b>Private sector:</b>			
Non-KAM Members	6	5	83.3%
KAM-Members	10	8	80.0%
Private sector associations	2	2	100%
<b>Public Sector:</b>			
Ministries	2	2	100%
Parastatals	3	3	100%
<b>Total</b>	<b>23</b>	<b>20</b>	<b>87%</b>

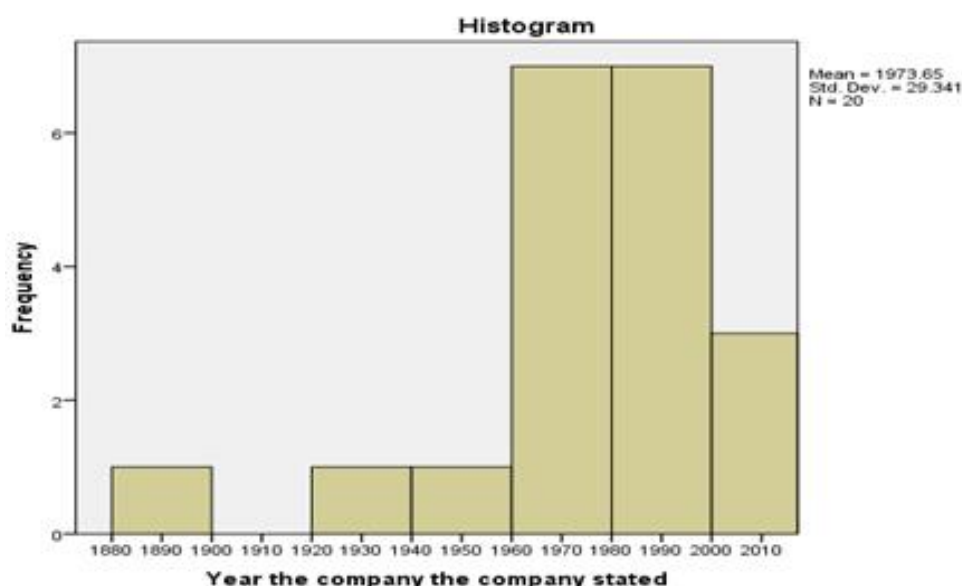
#### **4.2.2 Industry Age Structure**

The majority (54%) of the electrical and electronics industry manufacturers consisted of firms established before 1980, with some dating as far back as 1883 (Table 4.2 & Figure 4.1). One eighth (16%) of the firms were established for the first time after 2000. Thus, the sector operates on obsolete technology. The low technology processes were not aligned to contemporary business practices of the day of fragmented outsourced production systems (Magu, 2011).

This corroborated Magu's (2011) study in which he concluded that the Kenyan electrical and electronics manufacturing sector was dominated by obsolete low-technology production processes typical of less competitive segments in the electrical and electronics sectors (Lall, 2000; Haughton & Thornborn, 2004).

**Table 4.2: Age and Structure by Functional Activity**

Age structure	Manufacturers		Private sector associations		Policy makers		Public sector facilitators	
	No.	%	No.	%	No.	%	No.	%
Before 1980	7	54	1	50	2	100	0	0
1980-2000	4	30	0	0	0	0	2	67
2001-2005	1	8	0	0	0	0	1	33
After 2005	1	8	1	50	0	0	0	0
<b>Total</b>	13	100	2	100	2	100	3	100



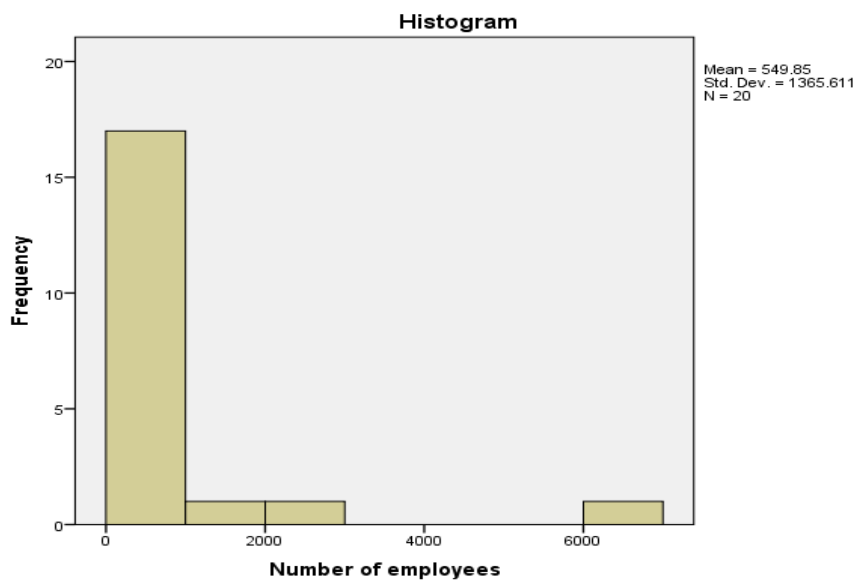
**Figure 4.1: Age Structure of the Companies/Organisations**

Unlike private sector associations, which had been active since 1959, 75% of the public-sector-facilitating institutions came into operation after 1980 with the advent for the Structural Adjustment Programmes (SAPs) (Table 4.2). The year of firm/organisation establishment correlated closely with operational policy and regulatory environment in Kenya. The manufacturing firms and facilitating institutions coming into operation between the 1980s and 2000 responded mainly to the changes in the policy environment of liberalisation and privatisation contained in

Sessional Paper No. 1 of 1986 (GoK, 1986). Those coming into operation after 2000 responded to changes and opportunities from expanded regional markets within the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) and globalisation intensified by the technological changes (GoK, 1986; EAC, 1999; COMESA, 1994).

#### 4.2.3 Number of Employees

The majority (85%, that is 17 out of 20) of the firms employed less than 1,000 employees while 10% of the firms employed between 1,000 and 3,000 employees (Figure 4.2). A minority (5%) of the firms engaged in excess of 6,000 employees with one other employing in excess of 2,000 employees. This was indicative of a Small Medium Enterprise (SME)-based electrical and electronics manufacturing industry.



**Figure 4.2: Number of Employees**

#### **4.2.4 Industry Structure**

The industry structure was reviewed in the context of core functions, legal status and funding modalities.

##### **4.2.4.1 Industry and Facilitators Structure by Core Functions**

Out of the sample of thirteen (13) responding manufacturers (Table 4.3), the majority (45%) of the firms were involved in the manufacture of electronic appliances, computer and office equipment and industrial electronics all of which are at the bottom of the value chain (Figure 2.6). The least number of firms, less than 20% operated in the most competitive segments of design, Research and Development (R&D) and services sectors. In this limited category were some of the high-end electrical and electronics manufacturing and services and installation of signage, access controls, automatic and digital door locks. In addition to operating in multiple categories, the manufacturing sector also operated from multiple-enterprise branch networks in the ratio of 2 to 1 (Table 4.3). The firms in the manufacture of electronic appliances and telecommunications registered the highest multiple enterprises. These were the same products with highest demand in Kenya.

In accordance with the International Standards of Industrial Classification (ISIC R 4) of All Economic Activities, the characteristics of the Kenyan electrical and electronics sector were consistent with the less-competitive segments in the value chain attracting low technology and knowledge intensity (Magu, 2011; Haughton & Thornborn, 2004; Erumban, et al., 2011; Lall, 1998). Consequently, there was very little by way of international trade in the Kenyan electrical and electronics sector.

**Table 4.3: Manufacturing Industry Structure by Branch Network**

<b>Broad Category (ISIC R 4)</b>	<b>No.</b>	<b>Single</b>	<b>Multiple</b>
Electronic products and appliances:			
Electronic appliances	7	3	4
Computer & office equipment	2	0	2
Industrial electronics	3	0	3
Electronic component	5	2	3
Telecommunications	4	0	4
Consumer electronics	3	1	2
R&D, design	2	0	2
Other	3	1	2

On the other hand, coordination (71%), dissemination (71%) and policy making (57%) dominated the core functions of the public and private sector facilitating institutions (Table 4.4). Technical support (14%) and regulations/enforcement (28%) was prioritised and handled by the least facilitators.

While it was good that coordination and dissemination was implemented by the majority of the facilitators, technical support and enforcement of regulations critical for a fragmented off-shored industry received the least prioritisation. There was the possibility of dissemination concentrating in very general information as opposed to that critical for the fragmented production in electrical and electronics manufacturing.

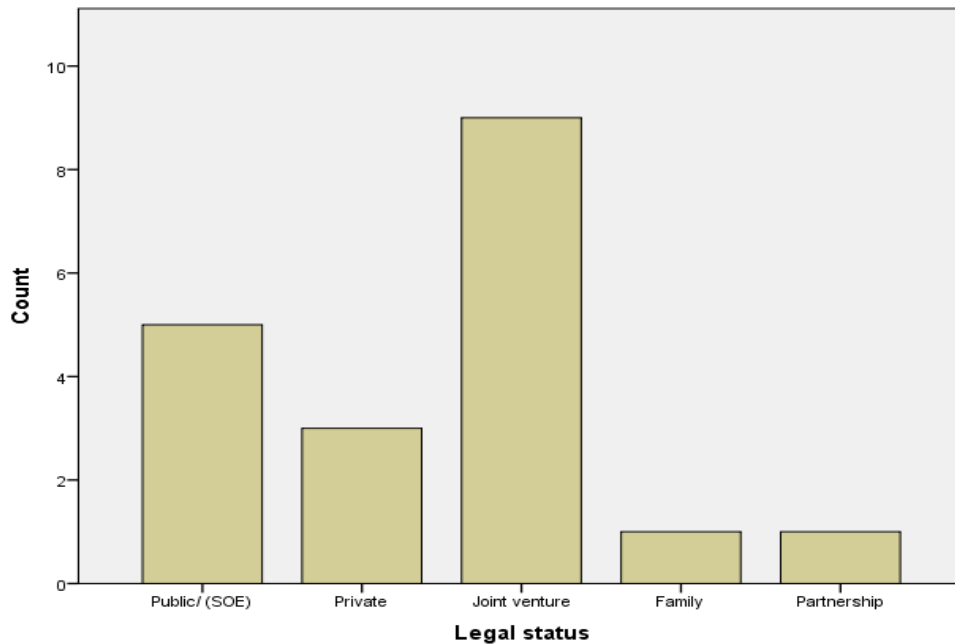
**Table 4.4: Public/Private Sector Facilitators by Core Functions**

<b>Core functions</b>	<b>Frequency</b>	<b>% Share</b>
a. Policy making	4	57
b. Technical support	1	14
c. Regulations/enforcement	2	28
d. Coordination	5	71
e. Dissemination	5	71

#### **4.2.4.2 Legal Status**

The highest number of operators in electrical and electronics sector manufacturing were in joint venture and private arrangements (Figure 4.3). On the basis of legal status, over 45% (9 out of 20) of the firms were operated as joint ventures while another 25% were family owned. The public sector was dominated by the ministries and parastatals.

This type of ownership was consistent with the prevailing government privatisation and market-based policies in which the government has divested from engaging in business, particularly in production and trade. In addition, the electrical and electronics sector had limited participation in the capital markets, in which less than 50 private companies are listed. This was consistent with a low level of maturity of the capital market (Ngugi, Manja &Maana, 2009). Fewer, if any, manufacturers in the electrical and electronics manufacturing sector were listed in the capital markets.



**Figure 4.3: Legal Status of Stakeholders in the Electrical and Electronics Sector**

#### **4.2.4.3 Share of Firms' Financing**

The main source of firm financing was private equity, accounting for 79% (Table 4.5), raising the possibility that even joint-venture undertakings (Figure 4.3) drew heavily from savings to finance business activities. This, in essence, meant that the resources could only sustain small-size businesses. A very small proportion (4%) of the businesses raised money from the stock market while even a smaller percentage (1%) obtained finances from the parent companies. None of the businesses reported to have raised money from venture capital. This is indicative of a stunted industry in which there was very little by way of investment and R&D for new innovations.

The findings were consistent with family-owned businesses, which in the case of Kenya operated in electrical repairs and manufacture of electrical appliances (GoK, 2007; GoK, 2008; KNBS, 2011). Further, their inability to mobilise resources from

partnerships and the general public gave an indication that there was very little by way of either local or foreign partnerships (Magu, 2011; Economic Commission for Africa—ECA, 1998). In effect, this closed out elements of off-shoring and outsourcing (Erumban, et al., 2011; Yagahouti, Moradi & Tajamodahmmadi, 2011).

This implies that competitiveness of the Kenyan electrical and electronics manufacturing sector was an uphill task since investments were small scale; attracting high overhead costs. As such, the market outlay was limited to domestic catchment. Further, the businesses were also unattractive to foreign investor partnerships. These results were at variance with Porter’s Five Forces of competition, which assume the existence of a large number of players with the possibility of new entrants with a wider spread of the global market.

**Table 4.5: Source of Firm Financing**

<b>Source of financing</b>	<b>%</b>
a) Private equity (e.g. self-financed, family, friends & partners)	79
b) Public funding (e.g. through stock market listing)	4
c) Bank overdraft or loan (debt)	7
d) Venture capital or business angle	0
e) Parent company	1
f) Other	9
<b>Total</b>	<b>100</b>

### **4.3 Operational Business Environment**

The operational business environment was reviewed in the context of the economic, social and political factors and the business communities’ awareness of globalisation and global value chain production systems that currently underpin competitiveness of the electrical and electronics manufacturing enterprises.



### 4.3.1 Economic Factors

The economic factors on the operational business environment are presented in Tables 4.6 and 4.7. These were analysed in the context of the critical contributions and impacts of macroeconomic stability and fiscal policies, transport logistics, access to affordable energy and eventual attraction of investors to set shop in Kenya.

#### (a) Fiscal and Macroeconomic Stability

Except for 23.1% of the manufacturers who were indifferent (neutral) to the role of fiscal and macroeconomic frameworks in the operational environment, the study established that 76.9% of the manufacturers were in strong agreement on the moderating effects of stable fiscal and macroeconomic frameworks in influencing the sector's competitiveness (Table 4.6). The mean score of 4.31 validated the results. There was no disagreement recorded.

**Table 4.6: Manufacturers' Views on the Critical Economic Elements of the Operational Environment**

Critical economic elements of the operational environment	Strongly Agree		Neutral	Disagree	Strongly disagree		Mean score	SD
	%	%	%	%	%	No.	No.	
i) Stable fiscal and macroeconomic Framework	53.8	23.1	23.1	0	0	4.31	0.855	
ii) Functional Transport infrastructure and logistics	53.8	38.5	7.7	0	0	4.46	0.660	
iii) Access to affordable energy	69.2	15.4	15.4	0	0	4.54	0.776	
iv) Access to air and sea transport	23.1	53.8	15.4	7.7	0	3.92	0.862	
<b>Average</b>	<b>50.0</b>	<b>32.7</b>	<b>15.4</b>	<b>1.9</b>	<b>0</b>	<b>4.31</b>	<b>0.788</b>	

The facilitators' mean score of 4.71 (Table 4.7) corroborated that of manufacturers' which stood at 4.31 (Table 4.6). All the facilitators were in agreement regarding the role of stable macroeconomic frameworks in the operational environment. These results indicated that both manufacturers and facilitators appreciated the role of macroeconomic and fiscal stability in business performance.

**Table 4.7: Facilitators' Views on the Critical Economic Elements of the Operational Environment**

	<b>Critical economic elements of the operational environment</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
		<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
(i)	Stable fiscal and macroeconomic Framework	71.4	28.6	0	0	0	4.71	.488
(ii)	Functional Transport infrastructure and logistics	85.7	14.3	0	0	0	4.86	.378
(iii)	Access to affordable energy	71.4	28.6	0	0	0	4.71	.488
(iv)	Access to air and sea transport	57.1	42.9	0	0	0	4.57	.535
	<b>Average</b>	71.4	28.6	0	0	0	<b>4.71</b>	<b>.472</b>

These results are corroborated by Magu's (2011) study, which concluded, among other things, that a less-than-favourable business environment limited private sector participation in the electric and electronics sector in Kenya. Porter's Diamond (1990) and Dunning's OLI (1998) theories reiterated the role of domestic and location-specific policy frameworks within the purview of governments in fostering business activities. Afif's (2009) study of the Moroccan electrical and electronics sector

reaffirmed the effectiveness of the liberalisation policy in spurring investments into the Moroccan industry.

The results suggest that manufacturers are willing to collaborate with the public sector in sustaining macroeconomic and fiscal policy stability. However, with Kenya's policy environment fully liberalised, there must be other challenges keeping away potential investors in the sector and these challenges require urgent attention.

#### **(b) Functional Transport Infrastructure**

In exploring the critical roles of transport logistics in the operational environment, the study findings as presented in Table 4.6 indicated that 92.3% of the manufacturers with a mean score of 4.46 were in agreement with the role of functional infrastructure in the operational environment while 7.7% were neutral. In addition, 76.9% of the manufacturers were in agreement on the need for access to sea and air transport for ease of accessing markets. The facilitators' corresponding mean scores for transport and energy were 4.86 and 4.57 respectively, indicative of the strong role in operational environment (Table 4.7). All agreed on the roles of the different elements in the efficient environmental operations. These results were an indication of the strong belief the business community had on the moderating effect of the economic factors in the operational environment of the electric and electronics sector's competitiveness.

The study findings corroborated Vision 2030 and the Integrated National Transport Policy (2009) that prioritised infrastructure as the key enabler of Kenya's development prospects (GoK, 2007; 2009). The prioritised need for infrastructural development is consistent with the poor GCI ratings of 2 to 3 out of 7 and the poor

ranking in the bottom 20% (GCI, 2008-2014). Further, over 75% of trade is carried on road transport in Kenya (GoK, 2009). Besides, Kenya is a gateway to the Eastern and Central African and international markets through the port of Mombasa and the Jomo Kenyatta International Airport.

Coupled with substantial regional and international commodity exports, the Kenyan infrastructure has to be maintained at very competitive levels to facilitate trade. The regional corridors, in particular the rail infrastructure, have to be upgraded to international standard in order for Kenya and regional member countries to sustain their competitiveness.

#### **(c) The Impact of Economic Elements on Market Access and Competitiveness**

In reviewing the expected impact of the economic elements on market access and competitiveness, the study explored stakeholder views on the impact of stable macroeconomic indicators and functioning infrastructure on business performance including attracting investors to set shop in Kenya. The stakeholders held strong views on the impact of economic factors on the business environment as presented in Table 4.8. Over 60% of the manufacturers were in agreement that stable macroeconomic indicators were good for business; positively influencing market access and competitiveness. A small proportion of 15.4% were in disagreement while 23.1% were neutral. Equally important was the expected impact of the functioning infrastructure, in which 92.3% of the manufacturers were in agreement and a minority group of 7.7% was neutral. The net effect of stable macroeconomic indicators and functioning infrastructure in attracting investors to set shop in Kenya was rated highly by 84.6% of the manufacturers with a minority of 15.4% being neutral. The impact of

the economic factors as measured by the mean scores was consistent with general agreement since the majority was in excess of 4. This was indicative of the roles of infrastructure and macroeconomic frameworks in the realisation of market access and competitiveness.

**Table 4.8: Manufacturers’ Views on the Impact of Economic Elements on Market Access and Competitiveness**

Impact of economic elements on market access and competitiveness	Strongly Agree		Neutral Disagree		Strongly disagree		Mean score	SD
	%	%	%	%	%	No.		
i) Stable macro-indicators are good for business	23.1	38.5	23.1	15.4	0	3.69	1.032	
ii) Functioning infrastructure sustains trade and investment	30.8	61.5	7.7	0	0	4.15	0.801	
iii) Attracts diverse participants (MNC, TNC, Born global, SMEs) to locate in the country	23.1	61.5	15.4	0	0	4.08	0.641	
<b>Average</b>	<b>25.7</b>	<b>53.8</b>	<b>15.4</b>	<b>5.1</b>	<b>0</b>	<b>3.97</b>	<b>0.825</b>	

The facilitators’ views with a mean score of 4.57 for stable macroeconomic frameworks and investor attraction and 4.86 for functioning infrastructure were stronger than those of the manufacturers (Table 4.9). All the facilitators were in agreement on the contribution of the economic factors to improved market access and competitiveness. The results were consistent on operational environment in which efficiently-functioning transport infrastructure and macroeconomic stability remained the key pillars of competitiveness.

**Table 4.9: Facilitators' Views on the Impact of Economic Elements on Market Access and Competitiveness**

Impact of economic elements on market access and competitiveness	Strongly Agree		Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
(i) Stable macro-indicators are good for business	57.1	42.9	0	0	0	4.57	0.535
(ii) Functioning infrastructure sustains trade and investment	85.7	14.3	0	0	0	4.86	0.378
(iii) Attracts diverse participants (MNC, TNC, Born global, SMEs) to locate in the country	57.1	42.9	0	0	0	4.57	0.535
<b>Average</b>	66.6	33.4	0	0	0	<b>4.67</b>	<b>0.483</b>

These results corroborated the GCI whose framework encompasses macroeconomic stability, especially with respect to inflation and interest rates that impact directly on the fiscal environment. Further, in the context of the GCI, well-developed infrastructure reduces the effect of distance between source and destination markets, thus improving on competitiveness. Kenya's GCI of 3.75 in 2013 corresponds to a factor-based economy (World Bank, 2013). Moreover, the changing business environment dictates on the critical factors at any one time in order to attract investment into the country (Cavusgil, Knight & Riesenberger, 2008). These same priorities are consistent with Vision 2030 enablers targeted for urgent intervention in order to improve the business environment.

The results imply that there is a need to prioritise the improvement of infrastructure and the macroeconomic environment in order to attract international investors. It would be prudent to address all the competitiveness pillars in order to gain all-round efficiency. These include institutions and human resources.

#### **4.3.2 Political Factors**

The study findings on the moderating effects of the political elements on the operational environment as presented in Tables 4.10 and 4.11 were analysed in the context of security, governance, political stability, market size and institutional efficiencies in the operational environment.

##### **(a) Critical Political Elements in the Operational Environment**

The role of security in the operational environment was rated highly (100% agreement) with a mean score of 4.69 by all the manufacturers. Equally important to the manufacturers was political stability in which 92.3% were in agreement and a minority of 23.1% disagreed. The manufacturers' rating of governance and corruption on the operational environment at 84.6% and a mean score of 4.08 was reinforced by the facilitators' concurrence with a mean score of 4.86 (Table 4.10). Institutions received the least rating by the manufacturers with 69.3% in agreement. The results indicated that security and political stability for both manufacturers and facilitators were very crucial for a functional operational environment.

**Table 4.10: Manufacturers' Views on the Critical Political Elements of the Operational Environment**

<b>Critical elements of the operational environment</b>	<b>Strongly agree %</b>	<b>Agree %</b>	<b>Neutral %</b>	<b>Disagree %</b>	<b>Strongly disagree %</b>	<b>Mean score</b>	<b>SD</b>
						<b>No.</b>	<b>No.</b>
i) Security	69.2	30.8	0	0	0	4.69	0.480
ii) Governance and corruption	30.8	53.8	7.7	7.7	0	4.08	0.862
iii) Performing institutions in both public and private sectors	23.1	46.2	23.1	7.7	0	3.85	0.899
iv) Political stability	69.2	23.1	0	23.1	0	4.54	0.877
<b>Average</b>	<b>48.1</b>	<b>38.5</b>	<b>7.7</b>	<b>9.7</b>	<b>0</b>	<b>4.29</b>	<b>0.780</b>

The security and political stability elements received strong support (100%) with a mean score of 5.00 from the facilitators (Table 4.11). Similarly, governance and operating institutions in both public and private sectors received high ratings, totalling to 100%, in their positive role in influencing the operational environment. There was no disagreement recorded against the role of these political elements.

**Table 4.11: Facilitators' Views on Critical Political Elements of the Operational Environment**

<b>Critical elements of the operational environment</b>	<b>Strongly agree %</b>	<b>Agree %</b>	<b>Neutral %</b>	<b>Disagree %</b>	<b>Strongly disagree %</b>	<b>Mean score</b>	<b>SD</b>
						<b>No.</b>	<b>No.</b>
i) Security	100.0	0	0	0	0	5.00	.000
ii) Governance and corruption	85.7	14.3	0	0	0	4.86	0.378
iii) Operating institutions in both public and private sectors	57.1	42.9	0	0	0	4.57	0.535
iv) Political stability	100.0	0	0	0	0	5.00	0.000
<b>Average</b>	<b>85.7</b>	<b>14.3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4.86</b>	<b>0.228</b>



These findings corroborated those of a study by Boermans, Todlfsema and Zang (2011) on the determinants of Hong Kong's manufacturing investment in China. The Hong Kong investments in China established the centrality of a stable political environment, government incentive policies and high investment returns in attracting Hong Kong's FDIs. Further, a study by Omomdi, Ombui and Mungatu (2013) established that a conducive environment with adequate resources and right competences makes it easy to achieve set MDG targets (Kiriti & Tisdell, 2005). These results are consistent with the OLI and Porter's Diamond theories in which firms set shop in certain locations on the basis of the positive attributes of the locations.

The results imply that security and political stability remain worrisome, and very few businesses would commit to expanding or bringing in additional investment if there is insecurity and an unstable political environment. There is a strong need to get the right environment for the different businesses.

#### **(b) The Impact of Political Factors on Market Access and Competitiveness**

As presented in Table 4.12, political stability had a stronger effect on investment decisions having received a rating of 92.3% agreement compared to market size, which received 84.6% positive rating from the manufacturers. There was no disagreement recorded against these attributes. However, 7.7% and 15.4% of the manufacturers were neutral on matters of political stability and market size being able to attract investment. In general, politics played a strong role in market access and competitiveness.

**Table 4.12: Manufacturers' Views on the Impact of Political Factors on Market Access and Competitiveness**

<b>Impact of political factors on market access and competitiveness</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
i) Political stability attracts investment	53.8	38.5	7.7	0	0	4.38	.870
ii) Market size encourages investment expansion	23.1	61.5	15.4	0	0	4.08	.641
<b>Average</b>	<b>38.5</b>	<b>50.0</b>	<b>11.6</b>	<b>0</b>	<b>0</b>	<b>4.23</b>	<b>0.756</b>

The facilitators equally had strong positive views on the roles of political stability with a mean score of 4.86 and market size with a mean score of 4.57 on investment decisions, market access and competitiveness (Table 4.13). All the facilitators rated positively the roles of politics and market size in attracting investment. Politics, nevertheless, received the stronger rating with 85.7% of the facilitators in strong agreement. These results affirmed the centrality of politics in business decisions.

**Table 4.13: Facilitators' Views on the Impact of Political Factors on Market Access and Competitiveness**

<b>Impact of political factors on market access and competitiveness</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
i) Political stability attracts investment	85.7	14.3	0	0	0	4.86	0.378
ii) Market size encourages investment expansion	57.1	42.9	0	0	0	4.57	0.535
<b>Average</b>	<b>71.4</b>	<b>28.6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4.72</b>	<b>0.457</b>

These results corroborate the OLI theories in which location-specific attributes are embodied in economic, political and cultural strictures (Dunning, 2001; Porter, 1990; Nasri, 2010; Sparks 2010). Afif's (2009) study on the Moroccan electrical and electronics sector highlighted the positive impact of perceptions of political stability in the location of more MNCs/TNCs investors in the country. This turned around the economic status of the country within a very short time, starting in 2003. These findings were further corroborated with Newton's (2008) study, which reaffirmed that in spite of the September, 2001, terrorist attacks on America, investors continued with their business as usual, since they had confidence in the American economy. Market size, according to the GCI, also influences business decisions to invest. The larger the market, the more rewarding it is for investors to locate their businesses in such markets.

The results imply that political stability was critical for business investment. These are further complemented with the market size. The domestic market is the greatest buffer for businesses. In this regard, businesses support government efforts of expanding markets through the various regional and international trade agreements.

#### **4.3.3 Business Environmental Factors**

In reviewing the business environmental factors, the study findings presented in Tables 4.14 and 4.15 explored critical business elements expected to influence the operational environment underlying business competitiveness. These included business/industry culture and consumer tastes, corporate governance, e-commerce, partnerships and political stability.

**(a) Critical Business Elements in the Operational Environment**

The manufacturers' views on the business environment are summarised in Table 4.14. The political stability rating of 92.3% agreement with a mean score of 4.54 reaffirmed the role of politics in business decisions. A minority of 7.7% were in disagreement. Business culture and ethics featured prominently in the business environment with 92.3% of manufacturers rating it highly with only 7.7% being indifferent. This was corroborated with a mean score of 4.31 for the manufacturers and 4.57 for the facilitators. Access to ICT networks also attracted a very high agreement rating from the manufacturers (92.3%) and a mean score of 4.46 and 4.86 for the facilitators. A minority group of 7.7% of manufacturers was neutral. Similarly, e-commerce was gaining importance with 69.3% of the manufacturers in agreement and the remaining 30.8% being indifferent. Corporate governance also received a strong rating with 84.6% of respondents in agreement and 15.4% being indifferent. These factors confirmed that the business environment matters in business performance. These findings are aligned to Porter's Diamond in which government interventions (politics, policies, regulations, culture, ethics, etc.) impact on business investment decisions.

**Table 4.14: Manufacturers' Views on the Critical Business Environmental Elements of the Operational Environment**

(a) Critical business elements of the operational environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Access to ICT networks	53.8	38.5	7.7	0	0	4.46	0.660
ii) Private sector partnerships with foreign investors	23.1	38.5	38.5	0	0	3.85	0.801
iii) E-commerce and e-business	30.8	38.5	30.8	0	0	4.00	0.816
iv) Corporate governance	23.1	61.5	15.4	0	0	4.08	0.641
v) Political stability	69.2	23.1	0	7.7	0	4.54	0.877
vi) Business culture and ethics	38.5	53.8	7.7	0	0	4.31	0.630
<b>Average</b>	39.8	42.3	16.7	0.2	0	4.21	0.736

The facilitators, as presented in Table 4.15, held very strong views on the role of politics (100%) in the efficient operation of the business environment. Equally, the role of ICT, corporate governance and business culture received full support from the facilitators. These results confirmed that the business environment strongly influences the operational environment.

**Table 4.15: Facilitators' Views on the Critical Business Environmental Elements of the Operational Environment**

(a) Critical business elements of the operational environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Access to ICT networks	85.7	14.3	0	0	0	4.86	0.378
ii) Private sector partnerships with foreign investors	42.9	42.9	14.3	0	0	4.29	0.756
iii) E-commerce and e-business	85.7	0	14.3	0	0	4.71	0.756
iv) Corporate governance	71.4	28.6	0	0	0	4.71	0.488
v) Political stability	100	0	0	0	0	5.00	0.000
vi) Business culture and ethics	57.1	42.9	0	0	0	4.57	.0535
<b>Average</b>	<b>73.8</b>	<b>21.5</b>	<b>4.8</b>	<b>0</b>	<b>0</b>	<b>4.69</b>	<b>0.486</b>

The results corroborated Sun's (2006) findings to the effect that exogenous variables often in the form of organisational, cultural, technical and chance events moderate the impact of main variables. For example, firms that have survived competition maintained the culture of investing in competitive intelligence (Nasri, 2010; McCray, Gonzales & Darling, 2010; Sparks, 2010). Government was an arbiter in the legal and regulatory frameworks, political and non-market activities determining industrial competitiveness and decisions in business locations (Sparks, 2010; OECD, 2002). These results are consistent with Porter's and Haines', which highlight the role of logistics in connecting producers and customers.

The results imply that governments and their related support are very essential in business and competitiveness. In this regard, concerted efforts have to be made in improving the business infrastructure to facilitate private sector partnerships with foreign investors. Investors have also to entrench self-governance, especially in a globalising market structure underpinned by cut-throat competition.

**(b) The Impact of the Business Environment on Market Access and Competitiveness**

In evaluating the impact of the business environment on market access and competitiveness, the study analysis focused on time management, technical market requirements, business equity ownership and the level of private involvement in the different business operations. The results in Table 4.16 highlight the centrality of time management and technical market requirements, with 100% of respondents in agreement, in facilitating international trade businesses. The mean scores in excess of 4.00 from both the manufacturers and facilitators on time management and technical market requirements reconfirmed the level of prioritisation. As would have been expected, family-based businesses attracting 53.9% agreement reaffirmed the low profile businesses attach to this type of equity ownership. However, private sector general consent with an agreement of 92.3% underscored the role of businesses in guaranteeing economic development. These results underscore the role of the business environment in market access and competitiveness.

**Table 4.16: Manufacturers' Views on the Impact of the Business Environment on Market Access and Competitiveness**

(b) Impact of the operational environment on market access and competitiveness	Strongly agree		Neutral		Disagree		Strongly disagree		Mean score	SD
	%	%	%	%	%	%	No.	No.		
i) Time management is crucial for international trade	46.2	53.8	0	0	0	0	4.46	0.519		
ii) Technical and market stands stabilise international trade	38.5	61.5	0	0	0	0	4.38	0.506		
iii) Family-based manufacturing businesses underpin international trade	15.4	38.5	23.1	23.1	0	0	3.46	1.050		
iv) Private sector involvement guarantees economic development	53.8	38.5	7.7	0	0	0	4.46	0.660		
<b>Average</b>	<b>38.5</b>	<b>48.1</b>	<b>7.7</b>	<b>5.8</b>	<b>0</b>	<b>0</b>	<b>4.19</b>	<b>0.684</b>		

The facilitators' views as presented in Table 4.17 were no different from those of the manufacturers. Time management carried the highest weight of 100% agreement with a mean score of 4.86 in as far as such factors impact on the business environment. Technical market requirements and private sector involvement received a positive rating of 85.7% each with the remainder of the respondents being neutral. Family-based manufacturing received the lowest rating with the majority of the respondents being indifferent. A participatory approach enhances the effectiveness of the business environment.



**Table 4.17: Facilitators' Views on the Impact of the Business Environment on Market Access and Competitiveness**

(c) The impact of the operational environment on market access and competitiveness	Strongly Agree		Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Time management is crucial for international trade	85.7	14.3	0	0	0	4.86	.378
ii) Technical and market standards stabilise international trade	14.3	71.4	14.3	0	0	4.00	.577
iii) Family-based manufacturing businesses underpin international trade	0	0	85.7	0	14.3	2.71	.756
iv) Private sector involvement guarantees economic development	57.1	28.6	14.3	0	0	4.43	.787
<b>Average</b>	<b>39.3</b>	<b>28.6</b>	<b>28.6</b>	<b>0</b>	<b>3.5</b>	<b>4.0</b>	<b>0.625</b>

The results are corroborated by the research findings by Ellis and Williams (1995) and Porter (1998), which confirmed that a number of factors including entry strategies, contracting, licensing product quality and market differentiation impacted on the potentials of market access. These results were further validated by Mwakaje's (2010) study of the role of technology in improving market access and profitability of rural farmers.

The implications of the results were that businesses have to adapt to the changing business environment in order to survive; in particular, time management such that the current delivery strategies with minimal stock-carrying implications are taken advantage of.

#### **4.3.4 Stakeholder Awareness on the Concept of GVC**

The study assessed the stakeholders' understanding of the new business environment of off-shoring to gain efficiency and/or competitiveness in new markets. The analyses in Tables 4.18 and 4.19 revealed that both the manufacturing enterprises and facilitating-institutions' understanding of the GVC concept were varied. There was, on average, a strong and more convergent tendency among the manufacturers to define the concept of GVC in relation to trade 84.6% (25%+59.6% share); mean score of 4.04; Standard Deviation (SD) of 0.702. The facilitators' views, on the other hand, were more dispersed; with general agreement based on the share of 67.9% (28.6%+39.3%), SD 1.152 and a mean score of 3.75. This meant that the Kenyan business community, due to its differences in understanding of GVCs as summarised in the next sections, may not be ready to apply the GVC concept in production processes.

##### **(a) MNC/TNC Arrangement in International Trade**

As presented in Table 4.18, the study evaluated the stakeholders' definition of GVC as a Multi-national Corporation/Transnational Corporation (MNC/TNC) business arrangement. The international trade arrangement definition carried the highest weight among both the manufacturers and the facilitators. The manufacturers strongly agreed (69.2%) that GVC was an MNC/TNC business arrangement in international trade.

Another 7.7% agreed on the same concept with 15.4% being indifferent while the remaining 7.7% disagreed. The mean score of 4.38 for the majority of the manufacturers and 4.00 (Table 4.8) for the facilitators; indicated that there was general agreement on the definition of GVC as a business arrangement for MNCs/TNCs in international trade.

**Table 4.18: Manufacturers' Understanding of the Concept of GVC, %**

Understanding of the concept of GVC	Strongly agree %	Agree %	Neutral %	Disagree %	Strongly disagree %	Mean score No.	SD No.
a) GVC is predominantly an MNC/TNC business arrangement in international trade	69.2	7.7	15.4	7.7	0	4.38	1.044
b) GVC is the form of management practice of international trade for the developed country companies	7.7	76.9	0	15.4	0	3.77	0.832
c) GVC is the form of international trade for modern technology products	7.7	69.2	23.1	0	0	3.85	0.555
d) GVC is for distribution of sales/exports or purchases of inputs and outputs	15.4	84.6	0	0	0	4.15	0.376
<b>Average</b>	<b>25</b>	<b>59.6</b>	<b>9.6</b>	<b>5.8</b>	<b>0</b>	<b>4.04</b>	<b>0.702</b>

However, the facilitators' understanding of GVC in the context of MNC/TNC international trade arrangement, as presented in Table 4.19, was of lower intensity. The majority (57.1%) of the facilitators were in strong agreement and the remainder either in agreement (14.3%), or indifferent (14.3%) and in strong disagreement (14.3%). This was corroborated with the facilitators' spread (SD 1.528), which was

wider among the facilitators compared to 1.044 for the manufacturers. The results indicated that GVC was generally understood by the different stakeholders in the context of international trade.

**Table 4.19: Facilitators' Understanding of the Concept of GVC, %**

Understanding of the Concept of GVC	Strongly Agree		Neutral		Disagree		Strongly disagree		Mean score	SD
	%	%	%	%	%	%	No.	No.		
a) GVC is predominantly an MNC/TNC business arrangement in international trade	57.1	14.3	14.3	0	14.3	14.3	4.00	1.528		
b) GVC is the form of management practice of international trade for the developed country companies	42.9	28.6	0	14.3	14.3	3.71	1.604			
c) GVC is the form of international trade for modern technology products	0	57.1	28.6	14.3	0	3.43	0.787			
d) GVC is for distribution of sales/exports or purchases of inputs and outputs	14.3	57.1	28.6	0	0	3.86	0.690			
<b>Average</b>	<b>28.6</b>	<b>39.3</b>	<b>17.9</b>	<b>7.2</b>	<b>7.2</b>	<b>3.75</b>	<b>1.152</b>			

These assertions contradicted the prevailing practice whereby MNCs/TNCs, in offshoring part of their production processes, participated jointly with SMEs across the globe (UNCTAD, 2002: 2004; and Porter, 1985). Studies by Humphrey (2000: 2002) and Schmitz (1999) demonstrated that different types of GVCs, driven by multinational buyers in industrialised countries and large manufacturer suppliers determine country-specific competitiveness (UNIDO, 2009).

In effect, the results imply that the Kenyan business community, with the direction from the facilitators, was likely to shy away from GVC-based businesses. Priority interventions, therefore, should focus on changing the mind-sets of policy makers, regulators and private sector associations to appreciate the role of GVCs in the present-day globalised business environment.

**(b) GVC as a Management Practice for Developed Country Companies**

The study results in Table 4.18 indicated that 76.9% of the manufacturers were in agreement in defining GVC as a management practice for developed country companies compared to 7.7% of the respondents who strongly agreed with this definition of the concept. A smaller proportion of 15.4% disagreed with the definition. The results from the facilitators' views in Table 4.19 indicated lower levels of agreement, with 42.9% in strong agreement and 28.6% in agreement. The facilitators, in equal proportions of 14.3%, were in strong and general disagreement. The mean score of 3.77 for the manufacturers and 3.71 for the facilitators on GVC as a management practice for developed country companies gave an indication of some element of neutrality with the views of the facilitators being more widespread with SD 1.604 compared to 0.832 for the manufacturers.

These findings contradict contemporary production processes of clustering and networking according to competences (UNCTAD, 2002:2004; Cavusgil, et al., 2008). Further, this type of GVC definition limited the potentials of outsourcing and off-shoring, which create opportunities for the integration of SMEs among the geographically-dispersed industries on the basis of competences (UNCTAD, 2010).

This form of indecisiveness was likely to translate into indifference in both policy and business decisions, which may not promote off-shoring along the GVC. As such, Kenya might lose out on leveraging high-technology electrical and electronics products, which developed and emerging economies used to transform their economies; with the possibility of missing out on Vision 2030's aspirations.

### **(c) Trading in Modern Technology Products**

The study findings in Table 4.18 showed that 76.9% (7.7% strongly agreed and 69.2% agreed) of the manufacturers interpreted GVC as a form of international trade for modern technology products. A group of 15.4% was neutral while 5% disagreed with limiting GVC to trade in modern technology products. Correspondingly, 57.1% of the facilitators (Table 4.19) were in agreement in interpreting GVC as a form of trading for modern technology products. None of the manufacturers were neutral or strongly disagreed with the concept definition. The mean score of 3.85 and SD of 0.555 tended to agreement among manufacturers while the mean score of 3.43 and SD 0.787 was consistent with indecisiveness for the facilitators. The findings were indicative of an industry that had not yet come to terms with contemporary fragmented production systems.

In the case of manufacturers, the findings corroborated existing theories on technology quotient as a basis for rating competitiveness (Haughton & Thorborn, 2004; Lall, 2000). According to Erumban (2011) and Lall (1998), developed (USA, Europe and Japan) and emerging economies (the Asian Tigers) had used technology products including electrical and electronics products to transform their economies.

These findings implied that Kenya had to draw from global lessons in order to leverage investment in modern and globally-traded technology products in order to grow her economy. The possibilities lie in off-shoring of part of the production process to the Kenyan business community.

#### **(d) Distribution Framework**

There was general understanding among the manufacturers that GVCs played critical roles in distribution; with a mean score of 4.15 (Table 4.18). The majority (83.6%) of the respondents were in agreement and 15.4% strongly agreed with the concept of GVCs being used as distribution frameworks for exports and imports. The understanding among the facilitators was slightly different with 57.1% in agreement, 14.3% in strong agreement and the remainder of 28.6% indifferent (Table 4.19). With an SD of 0.690, the facilitators appeared to have more divergent views compared to an SD of 0.376 for the manufacturers. Against the general agreement (with a mean score of 3.75) of the facilitators in defining the operational frameworks that spur business activities, there was the likelihood of the promotion of GVC-related economic activities.

These findings corroborated assertions that GVCs network geographically-dispersed producers including SMEs into fragmented production systems (Braga, 2000; UNIDO, 2009). They entail management of supply and buyer chains within and across firms in and outside country geographical boundaries (Porter, 1985; Haines, 2005). McDade's and Spring's (2005) study of 57 business men spanning across ten African countries confirmed the role of distribution frameworks employing networks in expanding market outlets for the private sector.

There was need for deliberate policy direction from the government in collaboration with private sector associations to promote the electrical and electronics sector, which has the potential to grow the Kenyan economy. This could start with the assembly of the Jubilee Coalition's (2013) post-election promised laptops for standard one pupils in public primary schools.

#### **4.4 Results and Discussions**

This section presents the analysis of the four variables in the study objectives: technology, innovation, regulation and market access including the moderating variable of the operational environment. It highlights the findings and implications thereof of the four variables and the moderating effect of the operational environment on the competitiveness of Kenyan electrical and electronics manufacturing enterprises. The findings were validated against literature review of previous studies of similar research topics. Factor analysis preceded the analysis and reporting on descriptive and inferential statistics.

##### **4.4.1 Indicators of Competitiveness**

The analysis of competitiveness was carried out using both primary and secondary data. The analysis based on secondary data presents Kenya's overall competitiveness from the Global Competitiveness Index's (GCI's) perspective. This allowed for Kenya's full assessment of the business environment against which the electrical and electronics manufacturing enterprises operate. The second level of analysis was based on the primary data from the survey. This was benchmarked to the GCI indicators as appropriate to establish if there was convergence between the two sets of indicators (GCI and the survey).



#### **4.4.1.1 Report on Kenya's GCI Indices**

There are various determinants that drive productivity and competitiveness. According to the GCI measure, competitiveness is mainly defined by 12 pillars categorised into basic requirements, efficiency enhancers and innovation and sophistication factors as presented in Table 4.20. The 12 pillars include institutions, infrastructure, macroeconomic environment, health and primary education as the basic requirements for competitiveness, higher education and training, goods and market efficiency, labour market efficiency, financial market development, technological readiness and market size as efficiency enhancers towards competitiveness and, lastly, business sophistication and innovation. The independent variables covered these pillars to different degrees. The individual and collective measures of GCI achievements are measured against a maximum score of 7. For illustration, the quoted percentage references, which took into account the trends over time, are based on averages for the period 2009-2014.

Technology impact on the competitiveness of the electrical and electronics manufacturing enterprises was benchmarked against efficiency enhancers in the goods and labour markets in the GCI indices. This is reflected in productivity, which is maximised with multi-skilled workforce in an efficient labour market. The efficiency of Kenya's labour market is over 65% (4.62 out of 7). It is also flexible in adapting to the changing business environment. Technology readiness remains low at 50% (3.36 out of 7), an indication of an economy operating from obsolete technology.

While Kenya ranks among the top 50 countries on innovation initiatives, the national potential remains underutilised at less than 50% achievement. It is easy to leverage this potential to stimulate the electrical and electronics sector's competitiveness. Similarly, the regulatory environment as measured by business sophistication appears to be advanced with achievements in excess of 60%. This reflects well on the country's overall business networks and the quality of individual firms' operations including networks and strategies. There is potential in innovation stimulating the electrical and electronics sector's competitiveness.

The quality of institutions, as a proxy for regulations, is determined by the legal and administrative framework within which businesses are operated and has a strong bearing on competitiveness and growth. In the case of Kenya, institutional efficiencies are at 50% potential. The outsourced production processes, institutions and regulations are critical in ensuring quality and timely deliveries to sustain interconnected production processes. Regulations appear not to be very effective in ensuring competitiveness.

Market access, on the other hand, is influenced by market size and quality of infrastructure, which reduces distances and enhances information access in integrating national markets with those of other regions at low cost. In addition, market size attracts large-scale investors whose production costs are low and thus making final products more competitive. The goods market efficiency standing at approximately 60% was an indicator that market potentials at both regional and global level had not been fully taken advantage of. Kenya is yet to exploit regional and global market potentials.

The operational environment was determined by the macroeconomic frameworks. Macroeconomic stability is important for business and, therefore, is important for the overall competitiveness of a country. Running fiscal deficits are inflationary and limit government abilities to react to business cycles as well as investing in competitiveness-enhancing measures. During the period 2009-2013, the macroeconomic indicator registered mixed performance, standing at close to 50%. In this respect, there is no firm predictability and few investors can take risks and invest in the country.

**Table 4.20: Kenya's GCI Trends, 2009-2014**

Year	2009		2010		2011		2012		2013		2014	
Out of	131		134		139		142		144		144	
Overall ranking	93		98		106		102		94		96	
Overall score (Max 7)	3.84		3.67		3.8		3.6		3.75		3.85	
Sub-components	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
<b>A: Basic Requirements</b>	<b>104</b>	<b>3.80</b>	<b>120</b>	<b>3.49</b>	<b>123</b>	<b>3.6</b>	<b>118</b>	<b>3.7</b>	<b>123</b>	<b>3.62</b>	<b>121</b>	<b>3.76</b>
1. Institutions	93	3.54	107	3.27	106	3.4	114	3.3	106	3.43	88	3.62
2. Infrastructure	91	2.86	92	3.01	103	3.1	103	3.1	103	3.09	102	3.24
3. Macroeconomic environment	107	4.37	121	3.43	133	3.4	117	4.0	133	3.39	132	3.64
4. Health and primary education	108	4.43	110	4.26	115	4.6	118	4.5	115	4.58	119	4.52
<b>B: Efficiency Enhancers</b>	<b>76</b>	<b>3.90</b>	<b>75</b>	<b>3.94</b>	<b>76</b>	<b>4.0</b>	<b>73</b>	<b>4.0</b>	<b>76</b>	<b>3.97</b>	<b>73</b>	<b>4.00</b>
5. Higher education and training	86	3.70	85	3.69	100	3.6	94	3.7	100	3.59	103	3.54
6. Goods market efficiency	74	4.12	73	4.09	93	4.1	80	4.1	93	4.10	80	4.21
7. Labour market efficiency	40	4.65	40	4.69	39	4.6	37	4.7	39	4.62	36	4.62
8. Financial market efficiency	44	4.68	37	4.67	24	4.7	26	4.8	24	4.74	31	4.68
9. Technological Readiness	93	2.88	96	2.99	101	3.3	98	3.3	101	3.27	89	3.36
10. Market size	71	3.40	74	3.50	75	3.5	77	3.5	75	3.52	77	3.58
<b>C: Innovation and sophistication factors</b>	<b>50</b>	<b>3.87</b>	<b>50</b>	<b>3.80</b>	<b>56</b>	<b>3.7</b>	<b>53</b>	<b>3.7</b>	<b>56</b>	<b>3.68</b>	<b>53</b>	<b>3.83</b>
11. Business sophistication	63	4.21	59	4.18	67	4.0	59	4.1	67	3.96	61	4.09
12. Innovation	42	3.52	48	3.41	50	3.4	52	3.4	50	3.41	46	3.56

(Source: Annual GCI Reports, 2008/9-2013)

#### **4.4.1.2 Sector Performance**

In order to assess the electrical and electronics sector's competitiveness, the study, through a qualitative analysis, assessed sector performance in relation to product/service diversity and structures and trade performance. It also explored reasons for partnerships critical in fragmented production systems.

##### **(a) Structure of the Sector**

In line with the contemporary electrical and electronics sector's competitiveness, the study explored the firms' main activities in order to determine possible location of value along the value chain. Between 2000 and 2010, the Kenyan industry was dominated by product manufacture and retail business (Table 4.21). The highest (65%) level of electrical and electronics businesses were concentrated in product manufacture over the three time horizons of 2000, 2005 and 2010. Service delivery declined from 16% in 2000 to 10% in 2010 while wholesale, retail and distribution, in principle, remained constant at 12%. The residue of 2-9% was obtained from other sources including after-sale support. This type of industry performance was consistent with the less-competitive segments of the electrical and electronics sectors (Haughton and Thorborn, 2004).

**Table 4.21: Firms' Main Activities (2000-2010)**

Main Activities/Year	2000	2005	2010
	%	%	%
Product manufacturing	65	65	65
Service delivery	16	12	10
Integrated systems or solutions	1	1	1
Wholesale, retail & distribution	13	12	12
Support, after-sales service & retail	3	4	3
Other	2	6	9
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

On the basis of self-rating, most (69.2%) of the players reported low value and low volume (61.5%) status in comparison with other players in the industry (Table 4.22).

Another 30.8% of the players assessed themselves as of medium size in both value and volume with the remainder (7.7%) categorising themselves among the high achievers on the basis of volume. This is indicative of an SME-based industry.

**Table 4.22: Status of Industry by Value and Volume**

Status	Value		Volume	
	No.	%	No.	%
Low	9	69.2	8	61.5
Medium	4	30.8	4	30.8
High	0	0	1	7.7
<b>Total</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>

The structure was consistent with the character of a non-competitive low technology and knowledge intense industry (EAC, 2011; KNBS, 2011; Magu, 2011). On the basis of Haughton's and Thorborn's (2004) knowledge and technology intensity classification of the electrical and electronics sector, the Kenyan industry falls within the category of basic services of repair and maintenance and assembly of original equipment. In accordance with Porter's (1985) Five Forces of competitiveness, the

threshold on the number of players in the industry does not warrant competition. Neither is there any likelihood of new entrants in the same lines since the Kenyan industry is not engaged in the more competitive segments of the electrical and electronics sector, which are in high demand by consumers.

These results were consistent with the characteristics of an SME-based industry, whose interests in the context of competitiveness are best served through linkages and networks with MNCs/TNCs (Lall, 2000). Unless Kenya diversifies out of product/hardware manufactures to the more competitive service-related sectors, the chances of integrating into the GVC are limited.

#### **(b) Export Performance**

Participation in the GVC was, in part, defined by trade intermediaries for value addition. Consequently, the study also assessed competitiveness on the basis of the proportion and share of exports in the different destination markets. This assisted in the assessment of domestic trade patterns and competitiveness and export behaviour to the regional and international markets. Particular attention was paid to the export patterns into the EAC and COMESA, taking into account that the Free Trade Agreements came into force in 2000, the EAC Customs Union in 2005 and the Common Market in 2010.

##### **(i) Local Markets**

As presented in Table 4.23, the domestic production destined for the local market was in the ratio of 3 to 1 during the period 2000-2005 and 4 to 1 in 2006-2010. While there was a substantial drop (from 33% to 6%) in the consumption of locally-produced

electrical appliances in the period 2006-2010 compared to 2000-2005 (33%); electrical components (22-22%), computer and office equipment (14-14%), telecommunications and broadcasting equipment (19-18%) and industrial electronics (22-24%) remained almost constant during both time periods. Local consumption of locally-produced electronics recorded substantial decline from 19% in the 2000-2005 period compared to 11% during the 2006-2010 time period. This was the same period when the ICT sector registered substantial expansion (KNBS, 2014). This means that the bulk of local demand was met from imports of the more modern and more competitive products.

In line with Magu's (2011) findings, these low export performances were consistent with production of non-traded products. This was the case in spite of the market-based policy framework present in Kenya since independence. Similarly, the export-led growth policies with the advent of the Structural Adjustment Programmes (SAPs) in the 1980s, as formulated in Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth (GoK, 1986), seemed not to have made an impact. Further, the findings also reinforced KNBS (2011) reports to the effect that 66% of the industry was in the business of repairs. In the context of trade performance, findings from this study on export performance are inconsistent with Porter's Five Forces of competition.

The implications from these findings is that there is urgency in the shift of the mind-set of the business community and public and private sector facilitators in the redefinition of policy scenarios to move up the value chain with potentials of integrating into the GVCs. The Kenyan industry appears to be losing ground on some

of the product lines it specialised in like electrical appliances and consumer electronics. The school computer laptop programme could be used as a stepping stone to improve the competitiveness of the electrical and electronics sector.

**Table 4.23: Proportion of Total Production Exported by Destination Markets (2000-2010)**

Year Product Type	2000-2005			2006-2010		
	Local (Kenya) %	Regional Markets %	Inter- national Markets %	Local (Kenya) %	Regional Markets %	Inter- national Markets %
i) Electronic Appliances	33	6	25	6	0	0
ii) Electronic Components	22	9	1	22	9	0
iii) Computer & Office Equipment	14	2	0	14	2	0
iv) Industrial Electronic	22	7	2	24	6	2
v) Telecommunications & Broadcasting Equip.	19	3	2	18	5	0
vi) Consumer Electronics (TVs, Air cons etc.)	19	4	0	11	5	0
vii) Design, R&D	11	3	2	14	2	0
viii) Other	19	4	0	21	3	0
<b>Average</b>	<b>19.9</b>	<b>4.8</b>	<b>4.0</b>	<b>16.3</b>	<b>4.0</b>	<b>0.3</b>

## (ii) Regional Markets

In spite of the expansion of the regional markets from the COMESA FTA in 2000, the EAC CU in 2005 and the EAC CM in 2010, the regional market share of Kenyan-originating electrical and electronics products for all categories of electrical and electronics products remained almost constant. There were small variations for the remaining product lines. The findings confirmed the character of an industry that had



not adapted to the changing business environment and consumer tastes as prescribed in the Porter's Five Forces of competition and the Dunning Eclectic theory on the basis of available resources and markets.

In analysing exports by regional and other international market destinations (Table 4.23), the export performances are similar to those of Table 4.10. The exports ranged between 1.5-10%, an average of 4.6% across all the product lines. The exports were also concentrated in the less-competitive, product-based sectors of electrical appliances and components. The main regional market was the EAC with Uganda, Rwanda and Tanzania as the key importing countries. Minimal exports into COMESA were reported. The international destination markets were principally Asia and the USA, though with insignificant performance in few products lines—electronic components, telecommunications and broadcasting equipment. The results are consistent with the Gravity Model, which predicts stronger trade with neighbours on the basis of geography (Chaney, 2011).

These results corroborated Kenya's current trade performance in which the EAC and COMESA markets accounted for close to 40% of trade (EAC, 2010). The results also gave the indication that similar non-competitive products were manufactured across the region at comparable costs (Porter, 1990). This is further demonstrated by the intra-Africa trade, accounting for less than 10% and intra-EAC trade accounting for about 13%. This demonstrated that Kenyan manufacturers appeared to service basically the domestic markets (ECA, 2010). This was unlike the case of the North Atlantic Free Trade Area (NAFTA) and the European Union (EU) examples of well-functioning regional markets that had led to deeper trading; accounting for 32% and

60% intra-regional trade respectively (UNCTAD, 2004; ECA, 1998). On the basis of the GCI, the goods market had continued to deteriorate, with the ranking declining from 74 out of 104 countries in 2009 to 93 out of 144 in 2013. This was reflective of the lack of competitiveness according to Porter's Five Forces and Diamond theories of competitiveness.

In essence, the Kenyan economic structure had stagnated within the non-tradable segments. The industry had not responded to take advantage of the expanded regional markets or the changing consumer tastes. The only way Kenya could benefit from the expansion of the regional and the globalising markets is to diversify the product lines and move up the value chain. The choice of the product lines to diversify into should preferably be informed by the current import patterns across the region and the structure of the globally-traded electric and electronics products.

### **(iii) International Markets**

Except for industrial electronics in which token exports of 2% were sustained during both time periods of 2000-2005 and 2006-2010 and one-off 25% electronics exports in 2000-2005, there were no exports recorded for other products in the time periods under reference (Table 4.23). Similar results were obtained from export destination analysis (Table 4.24) in which, on average, less than 1% of exports were destined for the international markets as compared with 4.6% to the regional markets. The findings were indicative of an industry that was not connected to the international markets. As such, the competitiveness theories are not applicable.

These findings were inconsistent with a sector integrated into the global economy where global liberalisation had led to intensified competition (Abdullah, 2011; ECA, 1998). The countries engaged in international trade had leveraged high-technology products like electrical and electronics products to transform their economies (Erumban, et al., 2011).

Unless Kenya comes up with new strategies of linking into the global markets, its trade prospects shall be limited. In spite of having signed up on many international and multilateral agreements, for the time being, Kenya should prioritise both the domestic and the regional markets through the preferential regional agreements. Engagement in the global markets should be attained through participation in off-shoring production processes.

**Table 4.24: Proportion of Exports by Destination Region and Countries**

Product Type	Regional Markets	Countries	% of exports	Inter-national Markets	Countries	% of exports
a) Electronic Appliances	EAC CO-MESA	Uganda Tanzania Rwanda	5.8	None	None	0
b) Electronic Components	EAC	Uganda Rwanda	5.0	ASIA USA	India USA	0.4
c) Computer & Office Equipment	EAC	Uganda Tanzania	3.5	None	None	0
d) Industrial Electronic	EAC	Uganda Rwanda	3.1	None	None	0
e) Telecommunications & Broadcasting Equipment	EAC	Uganda Tanzania	4.2	None	None	0.8
f) Consumer Electronics (TVs, Air cons etc.)	EAC	Uganda Rwanda	2.3	None	None	0
g) Design, R&D	EAC	Rwanda Burundi	1.5	None	None	1.2
h) Other	EAC	Rwanda Uganda	10.9	ASIA	Few	4.6
<b>Average</b>			<b>4.6</b>			<b>0.9</b>

### **(c) Source of Inputs**

Competitiveness can also be defined in terms of the source and type of inputs. The international markets remain the dominant source of inputs for the Kenyan electrical and electronics sector, accounting for 59.2%. The electrical and electronics sector's raw materials were sourced from the world competitor markets of Asia and Europe (Table 4.25). The international source countries from the regions of Asia and Europe include China, India, Taiwan, Germany, the United Kingdom (UK), France and Spain among others. Since the bulk of production ends with final consumers (Table 4.70), the results are at variance with Porter's Value Chain theory, which states that a product is rarely consumed in its original form. Thus, fragmented production systems have not taken root in Kenya.

These findings were divergent from Dunning's (2001) eclectic theory in terms of industry location on the basis of comparative advantage—either on the basis of factors of production or markets. The outsourcing of electronics manufacture to the Asian countries was, in part, influenced by low cost of labour and supportive business environment making such sources enjoy competitive advantage (UNIDO, 2009; Gereffi, Humphrey & Sturgeon, 2005). In this regard, Kenya could position itself for the migration of the lower-labour-cost economies as wages increase in Asia where the bulk of production now resides.

The location of the Kenyan industry in the value chain was not anchored on abundance of factors of production or consumer markets. Instead, it was anchored on existing technology; some of which had been in operation before independence in 1963. In this regard, Kenya stands to benefit from re-defining its relationship within the globalising business environment to identify niche segments that could be outsourced to Kenya, in order to be part of the global trading arrangements.

**Table 4.25: Source of Inputs by Market and Country**

<b>Local Kenya %</b>	<b>Region</b>	<b>Regional Markets</b>		<b>Region</b>	<b>International Markets</b>	
		<b>Countries</b>	<b>% of imports</b>		<b>Countries</b>	<b>% of imports</b>
22.3	EAC COMESA	Tanzania, Uganda Egypt,	18.5	Asia Europe	China, India Taiwan, Others Germany, UK France, Spain	59.2

#### **(d) Sources of Firm Incomes**

The study explored firms' sources of income to establish any partnerships or networked production processes. Except for computer and office equipment in which the main source of income was the headquarters in the ratio of 2 to 1, the reverse was the case for the other categories of the private sector manufacturers (Table 4.26). Otherwise, on average, twice as much of the income came from firm operations. This was an indication of integrated businesses in single units. This implied that firm activities were in narrow focus, concentrated in production for final consumption. Taken together with the results presented in Table 4.5, in which the predominant source of finance is private equity, the character of such firms was likely to be SME based.

**Table 4.26: Source of Income (2000-2011)**

Broad Category	2000-2005		2006-2010		2011	
	%		%		%	
	Firm	HQ	Firm	HQ	Firm	HQ
a) Electronic Appliances	29	17	29	18	28	19
b) Computer & Office Equipment	8	16	5	15	9	11
c) Industrial Electronic	9	6	10	6	10	6
d) Electronic Components	28	10	28	12	27	0
e) Telecommunications & Broadcasting Equipment	15	8	13	6	18	2
f) Consumer Electronics (TVs, Air cons etc.)	22	9	22	9	21	10
g) Design, R&D	5	3	6	2	7	1
h) Other	7	0	0	0	0	0
<b>Average</b>	<b>15.4</b>	<b>8.5</b>	<b>14.1</b>	<b>8.5</b>	<b>15.0</b>	<b>6.1</b>

These findings were consistent with a domestically-based industry, 66% of which concentrates in repairs (KNBS, 2011; Magu, 2011). Diversification of the electrical and electronics manufacturing sector outside hardware and appliances will create partnership opportunities capable of infusing modern technology in more competitive segments; with the potential to increase incomes from branch networks outside Kenya. The findings imply that the sector's competitiveness is compromised by the current production structure.

#### 4.4.1.3 Factor Analysis—Competitiveness

The findings of the factor analysis on competitiveness indicated that the factor loadings of 9 out of 30 items were greater than the threshold of 0.7 set for this study and, therefore, qualify for use in the subsequent analysis (Henson & Roberts, 2006) (Table 4.27). The factors that were eliminated in the analysis include GVC knowledge, cost and regulatory capacity constraint influencing business growth from market access and export market requirements. The remaining factors on R&D,

partnerships, market access and business facilitation mechanisms were subjected to qualitative and quantitative analysis to establish their contribution and significance to the electrical and electronics sector's competitiveness. The results were further benchmarked to the GCI indices.

**Table 4.27: Factor Analysis Competitiveness**

<b>Component</b>	<b>Loading</b>
<b>1. Understanding GVC</b>	
a) GVC is predominantly an MNC/TNC business arrangement in international trade	<b>0.407*</b>
b) GVC is the form of management practice of international trade for the developed country companies	<b>0.407*</b>
c) GVC is the form of international trade for modern technology products	<b>0.326*</b>
d) GVC is for distribution of sales/exports or purchases of inputs and outputs	<b>0.012*</b>
<b>2. Factors influencing business growth</b>	
a) Done nothing new	<b>0.198*</b>
b) R&D	<b>0.904</b>
c) Partnerships:	<b>0.904</b>
i. With local investor	<b>0.118*</b>
ii. With regional investors	<b>0.235*</b>
iii. With international investors	<b>0.090*</b>
d) Access to support industries	<b>0.904</b>
e) Other (Specify)	<b>0.904</b>
<b>3. Barriers to growth</b>	
a) Infrastructure	<b>0.860</b>
b) Access to skilled staff	<b>0.697</b>
c) Competition in goods and service markets:	
i. Competitors in particular markets	<b>0.362*</b>
ii. Local suppliers	<b>0.893</b>
iii. Local support services	<b>0.793</b>
iv. International support services	<b>0.083*</b>
d) Cost of finance and regulatory services	
i. Venture capital & other finance	<b>0.498*</b>
ii. Cost of regulatory compliance	<b>0.217*</b>
<b>4. Policy stand and reasons for partnerships</b>	
a) To fill gaps due to shocks or destabilisation of substitutes	<b>0.613*</b>
b) To cope with lost market share due to contraband and counterfeits	<b>0.497*</b>
c) To cope with competition	<b>0.303*</b>
d) To cope with higher demand due to lower prices	<b>0.622*</b>
e) To leverage technology and innovations from partners	<b>0.487*</b>
f) Due to capacity constraints	<b>0.148*</b>
<b>5. Reasons for market access</b>	
a) To take advantage of preferential market access in region and agreements	<b>0.674</b>
b) To avoid stringent market requirements in the international export markets	<b>0.246*</b>
c) To service existing contracts	<b>0.430*</b>
d) To take advantage of change in consumer tastes	<b>0.402*</b>

\*Items with less than 0.7 factor loadings upon rounding off



#### **4.4.1.4 Barriers to the Electrical and Electronics Business Growth**

In reviewing competitiveness, the study also reviewed the barriers to business growth in the electrical and electronics sector. The barriers covered were inefficient infrastructure, inadequate access to skill competences; lack of competition in the goods and services markets, poor access and high cost of investment resources, inefficient regulatory/trade facilitation services and other related operational costs.

##### **(a) Inadequate Infrastructure**

With a mean score of 4.00 and a standard deviation (SD) of 1.00, 92.3% (23.1% in strong agreement and 69.2% in agreement), the manufacturers rated infrastructure as one of the biggest barrier to business growth (Table 4.28). A smaller group of 7.7% strongly disagreed on the notion that infrastructure impacts negatively on business growth. The resounding agreement was consistent with most cited logistical challenges; and in particular, port efficiency received special mention as a key barrier to firm growth. This finding is consistent with the GCI measure in which infrastructure is a basic requirement for achieving competitiveness. Further, Porter's and Haines Value Chain theories highlight the centrality of trade logistics, including transport infrastructure as critical for competitiveness.

The infrastructure challenge was consistent with government assertion that transport costs account for up to 40% of the shelf product prices and negatively impacted on competitiveness [GoK, 2011; the African Development Bank (AfDB), 2009]. Accordingly, Vision 2030 prioritised infrastructure as one of the foundational enablers and diversified resource mobilisation and delivery mechanisms to leverage local and international private sector competences in infrastructure development at a faster pace.

This will address the unfortunate port inefficiencies in which the average dwell time of up to 13.1 days at the port of Mombasa compares to 3 to 4 days at the port of Durban, making transportation an expensive affair. For example, it took 19 days to move a container from Singapore to Mombasa (7,500 Km) and another 20 days to move it out of the Mombasa port to Nairobi (500 Km).

These findings corroborated the African Development Bank's study (2001), which confirmed African infrastructure deficit with the persistent lack of competitiveness (Ondiege, Moyo & Verdier-Chouchane, 2013). Similarly, AfDB (2010) highlighted the challenges of infrastructure deficits limiting the potential of SMEs in Africa in generating employment. These were validated by KIPPRA's (2001) Working Paper No.1, which concluded that the lack of policy framework on infrastructure development and rehabilitation undermined economic rewards of enhanced competitiveness from infrastructure development.

In recognition of the centrality of trade logistics in the connection of suppliers and consumers, the government prioritised infrastructure development as highlighted in Vision 2030 (Haines, 2005). This intervention has been carried through successive Medium Term Implementation Plans (MTIP), which have dedicated over 18% of the budgetary resources in infrastructure development. However, full benefits to the industrial sector lie in the upgrading of the rail transport network and improving port efficiency, expanding electricity generation and distribution and telecommunications facilities that collectively would enhance Kenya's competitiveness within and outside the region.

**Table 4.28: Barriers to Firm Growth**

<b>Barriers to firm growth</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	%	%	%	%	%	No.	No.
(a) Infrastructure	23.1	69.2	0	0	7.7	4.00	1.000
(b) Access to skilled staff	23.1	53.8	0	15.4	7.7	3.69	1.251
(c) Competition in goods and service markets:							
i. Local suppliers	8.3	75.0	0	8.3	8.3	3.69	1.032
ii. Local support services	30.8	38.5	15.4	7.7	7.7	3.77	1.235
(d) Other	7.7	93.1	0	0	0	4.08	0.277
<b>Average</b>	<b>18.6</b>	<b>65.9</b>	<b>3.1</b>	<b>6.3</b>	<b>5.2</b>	<b>3.85</b>	<b>0.959</b>

**(b) Skill Competences**

More than 75% of the electrical and electronics manufacturers were of the opinion that access to appropriate skill competences would impact positively on firm growth (Table 4.28). The highest proportion of 53.5% agreed that lack of skilled staff acted as a barrier to business growth with 23.1% in strong agreement. Less than 25% held contrary opinion on the role of skilled staff in business growth. The mean score of 3.69 gave an indication of indifference while the SD of 1.251 confirmed disparities in views among the manufacturers. This implied that substantial numbers of firms were engaged in activities that did not require highly skilled labour. On the basis of the GCI measure, higher education and training constitute efficiency enhancers with major contribution to competitiveness. This complements the RBV and knowledge management theories.

Building on government strategies of revamping education and training systems, the Kenyan industry can take advantage of the strategies targeting human resource technical competence improvements. This would facilitate the leveraging of

fragmented production systems that provide unique opportunities for labour exchange and skills upgrading at a much faster rate within the framework of the New Education Act (GoK, 2007; GoK, 2012; GoK, 2013). It will also assist in shifting production and trade to higher value-added goods and services and, thus, entrenching the export-led strategies (UNCTAD, 2003; Gereffi, Humphrey & Sturgeon, 2005).

These findings corroborated theoretical and empirical evidence of a number of studies on the need for diverse competence requirements along the value chain for enhanced innovation and productivity with resultant competitiveness (Porter, 1985; UNIDO, 2009; Hidding, Williams & Sviokla, 2011). The high unemployment rate of 40% according to KNBS (2012), especially among the youth, has partly contributed to the high levels of awareness on the need for diverse skill competences. This will create more employment opportunities across the different sectors of the economy including the regional markets. The education and training curricula should target the skill complements required in the market including those facilitating self-employment.

### **(c) Competition in Goods and Service Markets**

Competition in both goods and services markets was rated as critical in business growth on the basis of the mean scores of 3.69-4.00 (Table 4.28). More than 83% (8.3% strongly agreeing and 75.0% agreeing) of the manufacturers concurred that the stiff competition in the goods and services markets reduced the prospects of business growth. The mean score of 3.69 demonstrated the low level of competition among local suppliers. This impacted negatively on business growth. The pattern was the same for support service providers, in which close to 70% (30.8% and 38.5%) of the manufacturers agreed that competition in support services from international suppliers

undermined business growth in similar sectors. These observations are aligned with Porter's Five Forces of competitiveness theory components of strong rivalry from suppliers.

This was consistent with the government's Vision 2030 policy on liberalisation that facilitated efficient allocation of resources for the benefit of both consumers and investors. It also corroborated the prevailing multilateral arrangements in which tariffs have largely been dismantled (WTO, 1995; Ellis & Williams, 1995). In addition, the findings were at variance with McCormick's and Onjala's (2007) study on the positive effects of the liberalisation of the Kenyan Information and Communication Technology (ICT) sector in 1999. The policy change subsequently led to the innovation of mobile money transfer services from unexpected quarters (Anyasi & Otubu, 2009). However, ICT manufacture according to McCormick and Onjala (2007) is still at its infancy and, as such, leveraging the same sector for development might not be realised soon. With electrical and electronics products accounting for over 21% of the global trade, the solution to competitiveness in the electrical and electronics sector in Kenya and other developing countries lies in adapting and integrating into global value chains through off-shoring (Erumban, et al., 2011; ECA, 1998; Lall, 1998).

The assertions of competition being a barrier to firm growth were born out of the existing market structure whereby Kenya produced at the lower end non-competitive products but imported high-end electrical and electronics products and services to satisfy domestic demand. In addition, two thirds of the operational firms were in

electrical and electronics repairs (KNBS, 2011). There was need to reverse this structure to align with production with non-reusable products.

#### **(d) Operational Factors**

In the context of GVC, as presented in Table 4.29, the study explored R&D, partnerships and clustering of support and related industries with the potential to influence business growth. The reference period for the analysis was between 2000 and 2010. Given the watershed changes in the regional markets [the EAC CU and CM, COMESA Free Trade Agreement (FTA), the African Growth and Opportunity Act (AGOA)] and technology (liberalisation of communications in the late 90s) that had taken place during the same period, views were obtained from the electrical and electronics sector's actors on how some of these factors impacted on their business growth. The analysis is summarised in the following sections.

##### **(i) Research and Development**

Innovations of new products and services are catalysed by R&D in response to changed business environment or consumer tastes. This was rated highest (4.15 mean score) among the manufacturers and an SD of 0.689 demonstrated convergence of views. The analysis in Table 4.29 indicated that over 84% of the manufacturers (with 30.8% strongly agreeing and 53.8% agreeing) agreed that research was critical for business growth. The remaining 15.4% were neutral. None disagreed on the role of R&D in business growth. This gave the indication that the manufacturers believed in the role of R&D in expanding their businesses. This is consistent with innovation theories in which R&D leads to new product development, which in most cases is more competitive (Schumann, 2005; Porter, 1985).

These findings were consistent with the desk research by McCormick and Onjala (2007) of selected SSA countries (including Kenya) on the role of R&D in the diversification of ICT software development in propelling African countries to the league of emerging economies. Anyasi's and Otubu's (2009) survey on the impact of mobile banking in Pakistan recognised the role of R&D in development of new products from unexpected quarters. The case of mobile money innovations popularly known as M-Pesa in Kenya anchored on innovative research has also transformed the Kenyan financial sector (Anyasi & Otubu, 2009; Kubzanansky, 2011). Filippetti's (2011) European firm-level study on modes of innovation confirmed the centrality of R&D in underpinning competitiveness among cross-border, inter-connected clusters of producers.

To spur the Kenyan electrical and electronics sector's competitiveness, the government intervention in R&D activities needed to be increased since the Kenyan manufacturers were SMEs with limited resources. The electric and electronic sectors were characterised by economic activity limited to the low technology/knowledge segments, in which surplus resources may not be available. However, the sector could benefit from off-the-shelf researches or off-shoring by linking with the more modern segments of the economy.

**Table 4.29: Factors Influencing Business Growth (2000-2010)**

<b>Factors influencing business growth</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean Score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
(a) R&D	30.8	53.8	15.4	0	0	4.15	0.689
(b) Access to support industries	30.8	46.2	7.7	15.4	0	3.92	1.038
(c) Government support	84.6	0	7.7	7.7	0	4.62	0.961
<b>Average</b>	<b>40.4</b>	<b>25.0</b>	<b>7.7</b>	<b>23.1</b>	<b>3.9</b>	<b>3.8</b>	<b>0.985</b>

**(ii) Access to Support Industries**

On the basis of Table 4.29, the study established that there was strong agreement among manufacturers on the role of support industries in influencing business growth, with 30.8% strongly agreeing and another 42.6% in agreement. The minority (7.7%) disagreed on the need for support industries while another 7.7% were indifferent. The mean score of 3.92 tended to general agreement. However, an SD of 1.038 reflected the divergent views among the respondents. The findings were an indication of the commitment of the manufacturers to work in clusters.

In accordance with Porter's Diamond (1990), clustering as well as the proximity of support industries was critical for national competitiveness. In addition, clustering of support industries promoted knowledge sharing and learning critical lessons for competitiveness (McCormick & Pedersen, 1996; UNIDO, 2009). The demonstration effect from EPZ-based industries, with close proximity of support industries, exporting to international markets competitively provided good learning lessons (Henisz, 2002; Waheeduzzaman, 2011).



The electrical and electronics manufacturing sector had not taken advantage of the Export Processing Zones (EPZs) facilities despite the wide range of incentives. In order to realise Vision 2030 and benefits from devolution, dedicated industrial parks have to be established across the country to allow for the clustering of core and support industries. In addition, the county-level governance infrastructure provides a unique opportunity for the establishment of related clusters in Special Economic Zones (SEZs) in appropriate locations across the country. This would reduce costs making the final products competitive.

### **(iii) Government Support**

The manufacturers identified government support as an important factor influencing business growth that required urgent attention. Some of the areas that needed government support included efficiency of entry/exit ports, access to affordable credit facilities, firm-level competences and efficiencies, and product qualities. Close to 85% of the manufacturers were in strong agreement with 7.7% neutral and another 7.7% in disagreement (Table 4.29). This was further corroborated by the mean score of 4.62 and SD of 0.961. These assertions are consistent with Porter's Diamond (1990) in which government policy frameworks in form of the management of the macroeconomic and regulatory frameworks impact on business operations. In addition, the Dunning OLI Eclectic (2001) theory recognises that some of the attributes investors look up to include political stability, a critical element of the operational environment.

These findings corroborated Newton's (2008) study, which confirmed that despite the 2001 terrorist attacks on the USA, investors continued to set up businesses there. This was an indication that they had confidence in the government. Similarly, OECD (2000) underscored the role of the Chinese government interventions in attracting FDIs, the stringent operational environment notwithstanding. At the national level, these findings corroborated Kenya's Vision 2030 prioritised investment in transport infrastructure and reforms in the financial sector as critical foundations for competitiveness. The findings also corroborated the value addition strategy aimed at diversifying the Kenya export basket. The implications of the findings were the centrality of government in bringing about the desired change within private sector investments.

#### **(f) Partnerships**

In order to have a better appreciation of the impact of partnerships on businesses, the study explored a number of factors influencing the policy stands on partnerships by the different stakeholders along the value chain. These ranged from opinions and information to trade management services.

#### **(i) Opinion on Partnerships**

Policy stands and reasons for partnerships depended on the roles of the different stakeholders. The majority (89.3%) of the manufacturers were of the opinion that partnerships constituted part of the management structure with 66.1% indicating the need for contractual agreements. These were validated by the mean scores of 3.85 and 3.62 respectively (Table 4.30). However, 15.4% of the manufacturers disagreed with that notion. Overall, against a mean score of 3.74, there was a tendency of

general agreement on the need for partnerships. The SD of 1.015 confirmed differences in views among the manufacturers on the role of partnerships in the electrical and electronics sector's competitiveness. These findings are consistent with Porter's Value Chain (1985) theory, which postulates that products are rarely consumed in their original form. They have to be combined with other inputs along a continuum synonymous with fragmented production systems. Similarly, the results are aligned to the OLI theory in which industries are located on the basis of either raw materials or markets and also portends of fragmented production systems, which inherently flourish on the basis of partnerships.

These findings corroborated Haines' (2005:2008) acknowledgment of the formal and informal partnerships that bring together the different players in the goods trade. The same was also found in studies by Hidding, Williams and Sviokla (2011) and Mwakaje (2011), highlighting the role of technology in entrenching partnerships for business success.

The manufacturers were receptive to the notion of in-house contractual partnerships as part of management in own business (Table 4.30). However, they were somewhat resistant to regional and international partnerships (Table 4.32). In part, this was explained by the limited trade in these markets. This could be an area for future research, in guiding partnerships within GVC stands to create new opportunities for the Kenyan electrical and electronics sector's competitiveness.

**Table 4.30: Manufacturers' Opinions on Partnerships**

<b>Opinions on partnerships</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
i) Partnerships form constituent part of management in own business	30.8	38.5	15.4	15.4	0	3.85	1.068
ii) Contractual policy or agreement for managing your partnership	15.4	46.2	23.1	15.4	0	3.62	0.961
<b>Average</b>	23.1	42.3	19.3	15.4	0	<b>3.74</b>	<b>1.015</b>

**(ii) Partnerships in Information Access**

Information access is critical in business success. It strengthens linkages between suppliers, customers and intermediaries. In establishing the different roles that facilitators play in respect of information dissemination with regard to shifts in business environment, a number of indicators were evaluated. Policy makers rated business trend analysis highest (mean score of 4.50) followed by regulators with a mean score of 4.33 (Table 4.31). Overall, the policy makers were in agreement on the need to sensitise the business community on the shifting trends in business environment. The regulators, on the other hand, put more emphasis on business trend analysis (mean score 4.33) and responding to requests from the private sector (mean score 4.33). Private sector associations were indifferent in matters of information dissemination. While the combined opinions of the facilitators gave an indication of general agreement (mean score 4.25, SD 0.806), the net effect of information dissemination appeared not to have permeated the private sector associations that in general tended to strong disagreement (mean score 1.5, SD 0.707). The Haines Customised Value Chains and Porter's Value Chain theories underpin the results from

this analysis, to the extent that technology (internet) remains critical in information disseminations.

Unlike the developed and emerging economies in which continuous evaluation of the business environment is undertaken, the relevant facilitators did not prioritise policy and trend analysis with a view to responding to the private sector requests to meet changes in the business environment. For example, Afif's (2009) study on role of fragmentation and MNC/TNC partnerships noted that the tracking of the Moroccan sector liberalisation and partnership strategies underpinned the transformation of the economy from that of a low to medium technology country by 2003. Newton's (2008) study assessed the impact of the 9-11 terrorist attacks on the US economy and established that it had no major impact. This confirmed that national policies were critical in location of investments.

These findings were consistent with a sector which was not integrated into the global economy. It was apparent that the private sector including member associations were not aware of the changing trends in the business environment. It is incumbent upon the government to track such changes and inform the business community accordingly; besides making a deliberate attempt to promote those strategies that are most beneficial to the economy.

**Table 4.31: The Role of Facilitators in the Sensitisation of Shifts in the Business Environment**

Role of sensitisation of shifts in the business environment	Policy makers		Regulators/enforcement		Private sector associations		Combined performance	
	Mean score	SD	Mean score	SD	Mean score	SD	Mean score	SD
i. Policy analysis	4.33	0.577	0	0	0	0	4.43	0.535
ii. Business trend analysis	4.50	0.707	4.33	0.577	3.0	1.414	4.00	1.000
iii. Negotiating agreements safeguarding private sector interests	0	0	3.67	1.155	0	0	4.14	0.900
iv. Responding to requests from private sector	0	0	4.33	1.155	0	0	4.43	0.787
<b>Average</b>	<b>4.12</b>	<b>0.642</b>	<b>3.083</b>	<b>0.722</b>	<b>1.5</b>	<b>0.707</b>	<b>4.25</b>	<b>0.806</b>

### (iii) Partnerships in Production and Marketing

On further interrogation of the partnerships with regard to production and marketing, the manufacturers preferred local partnerships (44.23%) as opposed to regional arrangements (20%) in the case of sales (Table 4.32). In addition, the prioritised form of partnership by manufacturers in production was that of outsourcing (69.2%) and vertical (69.2%) arrangements in comparison with regional partnerships for sales; in which outsourcing accounted for 69.2% and 15.4% for vertical arrangements (Table 4.32).

**Table 4.32: Manufacturers' Views on Partnership Type by Production and Destination Markets**

Production-based partnership	Local		Regional		International		Overall	
	No.	%	No.	%	No.	%	Mean score	SD
Contracts	3	23.1	1	7.7	9	69.2	2.46	0.877
Outsourcing	9	69.2	2	15.4	2	15.4	1.46	0.776
Agency	2	15.4	10	76.9	1	7.7	1.92	0.494
Vertical	9	69.2	2	15.4	2	15.4	1.46	0.776
<b>Average</b>		<b>44.23</b>		<b>28.85</b>		<b>26.93</b>	<b>1.83</b>	<b>0.731</b>

There were no international sales partnerships reported by facilitators for the electrical and electronics trade (Table 4.33). However, the mean scores of less than 2 for both production and marketing partnerships were consistent with localised industries sourcing inputs externally while selling finished products locally.

**Table 4.33: Facilitators’ Views on Partnership Type by Production and Destination Markets**

<b>Sales-based partnership</b>	<b>Local</b>		<b>Regional</b>		<b>International</b>		<b>Mean score</b>	<b>SD</b>
	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>		
Contracts	6	46.2	7	53.8	0	0		
Outsourcing	4	30.8	9	69.2	0	0	1.69	0.480
Agency	5	38.5	8	61.5	0	0	1.62	0.506
Vertical	3	23.1	10	76.1	0	0	1.77	0.439
Other	1	7.7	12	92.3	0	0	1.92	0.277
<b>Average</b>		<b>29.26</b>		<b>70.58</b>	<b>0</b>	<b>0</b>	<b>1.75</b>	<b>0.426</b>

These findings were in contrast with the contemporary theories of locating industries on the basis of proximity to factors of production or markets (Dunning, 1998; Leontief, 1933; and Kojima, 1975). Further, products are rarely consumed in their original forms (UNIDO, 2009). Similarly, different stakeholders contribute to the final products (Haines, 2008) and, as such, the players have to be networked (Porter, 1985).

These findings are corroborated by Magu’s (2011) study, which concluded that Kenya produced non-tradable electrical and electronics products that ended solely in the domestic market with a few exports to the regional markets. The results are at variance with Afif’s (2009) study, which established that adoption of fragmented production processes in Morocco transformed the economy in a very short time.

On the basis of the segment that Kenya's production is concentrated in, the electrical and electronics sector is still in its infancy stage. Until market entry strategies complementary to the level of sophistication of the global industry are entrenched, the Kenyan electrical and electronics sector's partnerships shall remain underdeveloped. However, there is potential in building on the local production and regional sales' partnerships to explore off-shoring processes or deepen regional trade.

### **(iii) Types of Partnerships in Managing Exports**

From the analysis presented in Table 4.34, the most-cited mode of managing exports was that of using overseas distributors (53.8%) and working directly with overseas customers (53.8%). This was followed by having own offices (46.2%), working with local offices of multinationals (46.2%) and using technology—the internet (46.2%). With an average mean score of less than two (mean score 1.6 and SD 0.475), the results indicated that there was little by way of exports. In validating export management on the basis of membership in global value chains (Figure 4.4), less than half (38.5%) of the manufacturers were in one form or another in the global value chain. The theories underpinning these results are those associated with the Haines Customised Value Chains, Porter's Value Chain and competitive strategies.

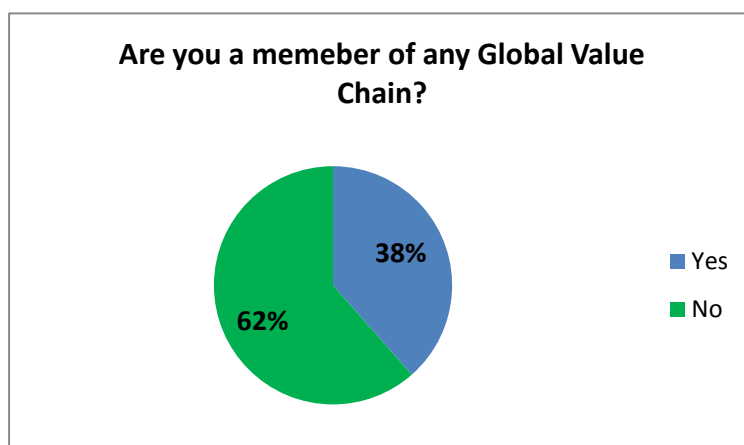
These findings are divergent from the expected returns of the different internationalisation entry strategies identified by renowned scholars based on competitive advantage, economies of scale, networks, incremental learning and adjusting through the Product Life Cycle (PLC), MNC/TNC and born global companies (Haines, 2005:2008; Kojima, 1975; and Cavusgil et al, 2008).



The electrical and electronics sector's integration to the global economy through fragmented production systems was likely to take much longer unless direct interventions are made by government. In addition, the electrical and electronics sector in Kenya has not re-organised itself to enter into partnerships with better-endowed investors for purposes of servicing regional markets.

**Table 4.34: Partnerships for Managing Exports**

Ways of managing exports	Out of 13	%	Mean score	SD
(a) Use overseas distributors	7	53.8	1.46	0.519
(b) Have own office(s) overseas	6	46.2	1.54	0.519
(c) Enter joint ventures with organisations overseas	5	38.5	1.62	0.506
(d) Enter alliances with multinational firms overseas	4	30.8	1.69	0.480
(e) Work directly with customers overseas	7	53.8	1.46	0.519
(f) Work with local offices of multinationals	6	46.2	1.54	0.519
(g) Use internet / electronic delivery	6	46.2	1.54	0.519
(h) Others	1	7.7	1.92	0.217
<b>Average</b>		<b>40.4</b>	<b>1.6</b>	<b>0.475</b>

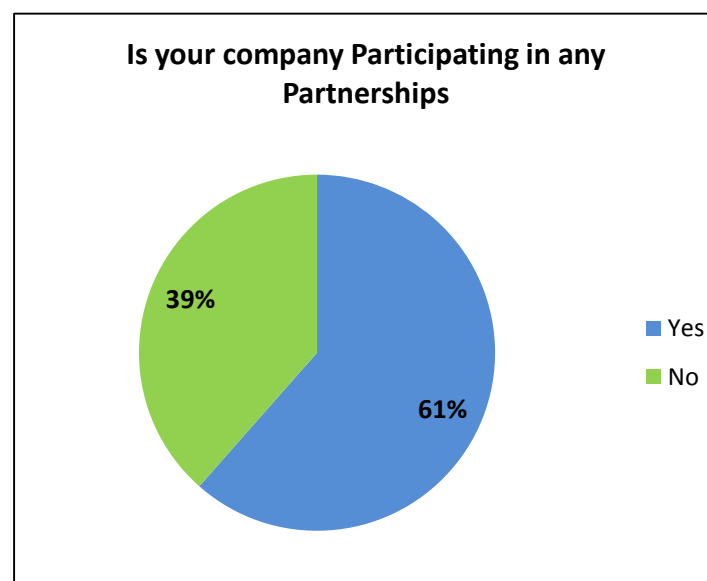


**Figure 4. 4: Manufacturers' membership in GVCs**

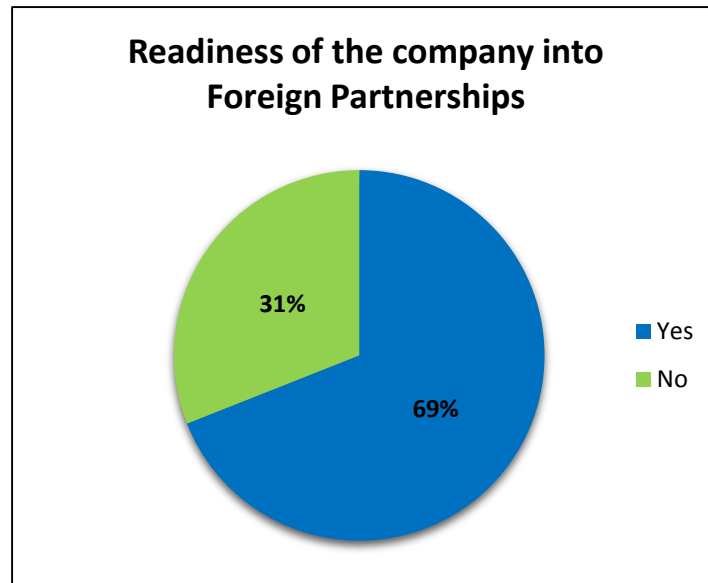
#### **(iv) Partnerships in Technology Transfer**

The study also explored the role of partnerships in introducing new technology in the electrical and electronics manufacturing sector for purposes of enhancing competitiveness. These assertions were validated by the manufacturers' declarations of operational partnerships (61.5%) (Figure 4.5) and potentials for local and foreign partnerships (69.2%) (Figure 4.6). These findings confirmed that the electrical and electronics sector manufacturers were ready to enter into strategic partnerships in order to access modern technology for purposes of improving their competitiveness.

Interrogation of the manufacturers on what inspired their technology-based partnerships revealed that the driving factors were mainly: market access, gaining competitiveness, introduction of new technologies for economies of scale, cost reduction, leveraging R&D opportunities and accessing new skill competences from the better-endowed partners.



**Figure 4. 5: Is your company participating in any partnership?**



**Figure 4.6: Is it ready for local or foreign partnerships?**

These findings were corroborated by Porter's (1985) and UNIDO (2009) value chain theories in which a product was a consolidation of production processes and partnerships of different producers along a continuum of a production chain. Hidding and Sviokla (2011), in their study, demonstrated that networks of first movers and followers leveraged each other's competences to avoid re-inventing the wheel. Strategic partnerships also aided in the shift of labour-intensive volume equipment manufacturing to Asia while the knowledge intense segments remained in Europe and USA (Haughton & Thorborn, 2004). The role of strategic partnerships in the electrical and electronics sector was further demonstrated by the ratio of outsourced manufacture against in-house manufacture, which stood at 73% to 27% in 2004 (Schipper & Hans, 2005). This was an indication of locating specialised technology in different destinations with different competences.

These findings imply that though the Kenyan industry was dominated by family-based ownership, their positive attitude to partnerships was not consistent with the practice on the ground. Nevertheless, introduction of outsourcing in the electrical and electronics sector could open doors for part of the equipment contract manufacturing to move from the emerging economies to the developing countries including Kenya. However, further research should be carried out to determine the optimum mode of fundraising for technology upgrading while safeguarding family interests.

**(g) Reasons for Adoption of Export Management Structures**

The analysis of the reasons for the adoption of the different management structures of exports was broadly divided into market access and competition. However, export strategies were aligned to markets with preferential trade arrangements.

The preferential market access influenced the mode of exportation as presented in Table 4.35. There were 61.6% (strongly agreeing—15.4%, agreeing—46.2%) of manufacturers in agreement that the choice of export market strategies were aimed at taking advantage of the preferential regional market access. Close to one third (30.8%) of the respondents were neutral with a minority of 7.7% strongly disagreeing. The results were indicative of an industry that could only compete in markets that are insulated. The sector may not be ready to exploit new opportunities in non-preferential regional and international markets. Matters of coping with competition were not equally ranked since the sector lacked competitiveness. As such, exports into the regional markets arose from the added advantage of non-payment of customs duty. The adoption of the applicable strategies into the regional markets is consistent with the Gravity Model.

These findings corroborated assertions by Haughton and Thorborn (2004) and OECD (2000) that behavioural changes in the market place influence trade. Some of the market instruments that impact on market access are better insulated in preferential markets. These include fiscal policies (duty, taxes and subsidies), technical standards and accreditations systems, information access and non-market stances such as politics and consumer tastes. In this regard, there is need to balance market and non-market requirements.

The Kenyan electrical and electronics sector potentials, as presently structured, are incapable of taking advantage of the available preferential markets including servicing contracts, where they exist. However, the business community seemed to be adequately sensitised on the need for compliance with technical market requirements. It would take less effort to integrate local producers into the regional and international markets.

**Table 4.35: Market Access Reasons for the Adoption of Export Management Structures**

<b>Reasons for adoption of management structures</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
To take advantage of preferential market access in region and agreements	15.4	46.2	30.8	0	7.7	3.62	1.044
<b>Average</b>	<b>15.4</b>	<b>46.2</b>	<b>30.8</b>	<b>0</b>	<b>7.7</b>	<b>3.62</b>	<b>1.044</b>

**(h) Potential Interventions to open up the Kenyan Electrical and Electronics Manufacturing Sector for GVCs**

In recognition of the stunted electrical and electronics sector, the stakeholders identified priority intervention areas to facilitate the sector's participation in the GVCs. All stakeholders concurred on the need for infrastructure development and a conducive business environment. The private sector, in particular, underscored the need for research and development for better innovations to take manufacturing to the next level. To complement this policy stand, a number of strategies were proposed. These included investing in new skill complements for enhanced productivity; promoting partnerships and networks within and outside the country; provision of adequate incentives and efficient and competitively-priced trade logistics (like energy and transport) in order to make Kenyan-originating products competitive.

The public sector concurred with the private sector proposals. However, it cited other challenges requiring urgent attention that included skills upgrading for enhanced productivity, technology upgrading and managerial innovations to entrench wide stakeholder involvement in policy formulation. In line with Vision 2030, the public sector hopes to promote the country as a global hub for the manufacturing sector. In this regard, some of the strategies proposed included more technical support to prepare the firms to meet the challenges of a changed global business environment. In addition, a reduction of the cost of doing business by providing utilities at competitive rates was also prioritised.

The continued survival of enterprises depended on their ability to innovate and upgrade their capabilities by networking and learning from global corporations and other clusters. The e-business platforms have also created bypasses of intermediaries by selling/purchasing directly, thus creating a level trading platform for both large and small firms regardless of geographical location.

Additional views were solicited from the manufacturers on the readiness of the Kenyan manufacturing industry to participate in GVCs where multinationals outsource part of their production (Table 4.36). There was strong (84.6%) concurrence from the manufacturers that the Kenyan electrical and electronics industry was ready to be part of the global value chains. However, only 5 out of 13 (38.5%) of manufacturers indicated that they were already members of some form of GVC.

**Table 4.36: Manufacturers’ Opinions on the Kenyan Industry Readiness to Participate in GVCs**

Responses	KAM	Non-KAM	%
(a) Manufacturers views on readiness to participate in GVC			
Yes	6	5	84.6
No	2	0	15.4
<b>Total</b>	<b>8</b>	<b>5</b>	<b>100.0</b>
(b) Manufacturers’ membership in GVCs			
Yes	2	3	38.5
No	6	2	61.5
<b>Total</b>	<b>8</b>	<b>5</b>	<b>100.0</b>

Similar views were echoed by the public and private sector associations (100%) (Table 4.37). These findings were at odds with the Kenyan structure of the electrical and electronics sector dominated by low technology segments (KNBS, 2011). Further, the EAC Trade Report (2011) stated that the Kenyan industrial share had declined from 18% in 2005 to 15% in 2010, an indication of low technology uptake in industrial activities.

**Table 4.37: Facilitators’ Opinions on the Kenyan Industry’s Readiness to Participate in GVC**

<b>Opinion on GVC</b>	<b>Policy makers</b>	<b>Parastatals</b>	<b>Private sector associations</b>	<b>%</b>
Yes	2	3	2	100
No	0	0	0	0
<b>Total</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>100</b>

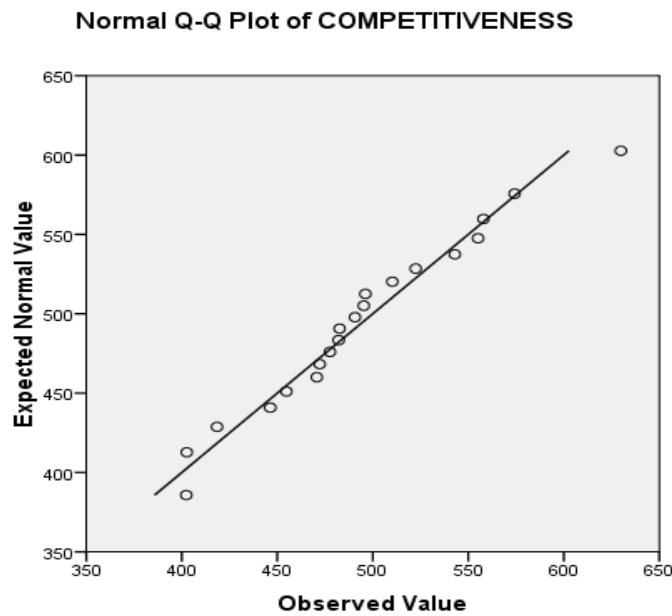
The implications were that the industrial structure in operation cannot allow for outsourcing. There is need for complete overhaul of the industrial policy and strategy to facilitate fragmented production systems that define competitiveness in the current business environment.

#### **4.4.1.5 Normality Tests**

For purposes of making inferences from the study, a normality test was performed on the sample observations. This was to establish the pattern of distribution of the dependent variable, competitiveness against the independent variables and its similarity to the universe population (Thode, 2002). A Q-Q plot using the plot of quintiles of a standard normal distribution against the corresponding quintiles of the observed data of the independent variables is presented in Figure 4.7. The resulting plots roughly follow a straight line with a positive slope, at approximately 45<sup>0</sup> degree



angle. This is indicative of a normal distribution. The sample population is similar to the universe population. As such, competitiveness is normally distributed. In this regard, statistical inferences can be made against analysis of the data.



**Figure 4. 7: Normality Test on Competitiveness**

#### **4.4.2 Effect of Technology on the Electrical and Electronics Sector's Competitiveness**

The first objective of this study was to determine the effect of technology on Kenya's electrical and electronics manufacturing enterprises' competitiveness that should be prioritised in the current business environment. The investigations focused on the critical issues and factors impacting on technology adoption. It also addressed strategies that could be prioritised in light of the paradigm shift in outsourcing and off-shoring of production processes in the current business environment. These included technology upgrading, further investments for enhanced productivity and modernisation of the communication systems, intensified staff competences and management efficiencies.

##### **4.4.2.1 Factor Analysis on Technology**

The findings of the factor analysis on technology indicated that all the eight weights ranged between 0.583 and 0.854 (Table 4.38). Out of the 8 factor loadings, 6 met the minimum threshold of 0.7 set for this study (Henson & Roberts, 2006). Therefore, the types of investment, management and communication systems and staff competences, as presented in Table 4.38, were analysed and tested to determine the effect and contribution of technology on the competitiveness of Kenyan electrical and electronics manufacturing enterprises. The following sections present qualitative and quantitative reports from the analysis.

**Table 4.38: Factor Analysis -Technology**

Component	Loading
<b>1. Technology Adoption:</b>	
i) Investing in specialised modern technology	0.583*
ii) Going into partnership with better endowed partners	0.605*
iii) Investing in new products dominating the global markets	0.731
iv) Adopting contemporary fragmented production systems governing competitiveness	0.619*
<b>2. Management and Operational Efficiencies:</b>	
i) Investing in a flexible business strategy in order to cope with the changing consumer demands	0.692
ii) Investing in modern distribution systems	0.789
<b>3. Communication and Information Systems:</b>	
i) Modernising communication and information and systems	0.782
<b>4. Staff Competences:</b>	
i) Undertaking continuous staff development in order to cope with changing market requirements	0.854

\*Items with factor loadings less than 0.7 upon rounding off.

#### **4.4.2.2 Technology Adoption**

In matters of technology adoption, the manufacturers recognised the need to invest in new products dominating the global market, with 84.6% in agreement (mean score of 4.00) while the remaining 15.4% were either neutral (7.7%) or in disagreement (7.7%) (Table 4.39). Despite 71.4% of the facilitators being in agreement (mean score 4.14), there appeared to be divergence in committing to investing in global products given the SD of 1.215, which was in excess of 1. The findings gave the impression that Kenyan businesses were keen to invest in new global products provided adequate structural changes in the industry had taken place. The findings are aligned to Porter's Diamond on firm strategy and OLI theories in which location is on the basis of market demand and resource availability. In addition, the new technology products associated

with short product life cycles require regular technology updating in order for the products to remain relevant (Solow, 1956).

**Table 4.39: Stakeholders' Views on Critical Factors in Technology Adoption**

Production-based investments	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Manufacturers' views on investing in new products dominating the global markets	23.1	61.5	7.7	7.7	0	4.00	0.816
ii) Facilitators' views on investing in new products dominating the global markets	57.1	14.3	14.3	14.3	0	4.14	1.215
<b>Average</b>	<b>40.1</b>	<b>37.9</b>	<b>11</b>	<b>11</b>	<b>0</b>	<b>4.07</b>	<b>1.016</b>

These views were consistent with Solow's (1956) theory of short Product Life Cycle (PLC) requiring continuous product renewal to meet the changing consumer tastes. The Wall Street Journal (2002), reported that manufacturers of electrical and electronics products concentrated on making products with short shelf life, often with short warranty. Dell Computers for example, had reduced their warranty to one year while Sony required buyers to register or else enjoy a warranty of 90 days. Similarly, and consistent with short PLC, very cheap mobile phones are now available in the market. The cost of repair for such products when they break down is no different from the purchase of a new one.

The results imply that whereas there was a strong agreement on the part of both the manufacturers and facilitators on investing in new global products, production technology was either lacking or too expensive to purchase. Besides, over 66% of the

traders were in repairs, often rehabilitating second-hand products. There is, therefore, urgency in setting up a technology fund from which the manufacturers can access investment resources at affordable prices. However, with the predominance of short shelf-life products, the Kenyan business community has to adapt to the new business environment. Otherwise, the old traditional products shall no longer be trendy, particularly among the younger generation. Thus, the few remaining manufacturers shall close down. These findings portrayed the non-alignment of the country's policies and practices in as far as engaging in the production of products traded at the global level were concerned.

### ***Technology upgrades***

The findings on critical factors of technology adoption in Table 4.40 were further validated through latest technology upgrades. In order to validate possible factors impacting on technology adoption, the study also established the timeframes of the latest technology upgrades. The majority (over 69.2%) of the firms (9 out of 13) upgraded their technology after the coming into effect of the East African Community (EAC) in 2005 (Table 4.40). Fewer firms (2 out of 13 or 15.4%) upgraded their technology with the coming into operation of the Common Market for Eastern and Southern Africa (COMESA) Free Trade Agreement (FTA) in 2000. These results mirror the GCI of less than 50% for technology competitiveness. Market access appeared to be one of the factors impacting on business decisions for further investment. In this regard, it would appear that market access prompted manufacturers to upgrade their production technologies in order to remain competitive in the market

place. The results are anchored on WTO globalisation and regionalisation theories in which entry strategies have a strong impact on competitiveness.

**Table 4.40: Technology Upgrades**

<b>Year</b>	<b>1999</b>	<b>2000</b>	<b>2005</b>	<b>2007</b>	<b>2008</b>	<b>2011</b>	<b>2012</b>	<b>Total</b>
No.	2	2	2	1	1	2	3	13
%	15.4	15.4	15.4	7.7	7.7	15.4	23.1	100

These findings were corroborated by the Global Competitiveness Index (GCI) assertions that technology competences, among other factors, determined competitiveness including product diversification in order to move up the chain (Lall, 2000; Waheeduzzaman, 2011; OECD, 2007; Erumban, 2011). In spite of the technology upgrading, Kenyan electrical and electronics products did not move from the low technology and low knowledge-intensity levels (Haughton & Thornborn, 2004; GoK, 2007; Magu, 2011). Neither did they move up the value chain. These results were consistent with Kenya's poor ranking in the bottom 10% in the GCI (World Bank, 2013). This, therefore, was an indication that the low technology-intensity upgrades made were consistent with those for the non-competitive sectors.

The firms appeared to be ready to upgrade their technology judging from the proportion of the companies that had upgraded in the last five years. However, there could be the problem of funding given that most of the firms were Small and Medium Enterprises (SMEs). There might be need to either evaluate the possibility of establishing a technology fund or investing in promotion of strategic partnerships for the purposes of encouraging technology transfer. Further, the globalising business environment within the World Trade Organization's (WTO's) multilateral and

regionalisation arrangements as well as the off-shoring of production processes might have created the impetus for technology upgrading.

#### **4.4.2.3 Management and Operational Efficiencies**

The study reviewed the contributions of technology in improving management efficiencies and operational strategies in furthering the adoption of new technology in the electrical and electronics sector. These were analysed in accordance with the views and practices to the extent that they impacted on technology adoption. These included adoption of flexible business strategies and distribution systems consistent with the changing market requirements and business environment.

##### **(a) Flexible Business Strategies**

Due to the constantly-changing technology applications in the electrical and electronics sectors, the need for flexible business strategies to guide operations becomes imperative. Consequently, the study obtained stakeholders' views regarding investing in flexible business strategies aligned to the obtaining business environment. A very high proportion of 84.6% of the manufacturers agreed on investing in flexible business strategies in order to cope with the changing consumer demands in a dynamic competitive business environment (Table 4.41). The remaining 15.4% were either neutral (7.7%) or in disagreement (7.7%) on the need for flexible business strategies. This was corroborated with the mean score of 3.85 and SD of 0.689. However, the facilitators' verdict on the need for flexible business strategies was much stronger, with 100% agreement and a mean score of 4.43 and SD of 0.535 (Table 4.42). These results confirmed that the industry was aware of the changing local and globalised business environment. Indeed, manufacturers' outlets have

changed substantially in Kenya, with the supermarkets increasingly displacing the traditional wholesaler and retail outlets in distribution. These results are consistent with the RBV and knowledge management views of the operational environment as espoused in the Lewin (1951) Freeze, Unfreeze and Refreeze Model and the ADKAR Change Management Model focusing on specific business results.

**Table 4.41: Manufacturers' Views on the Role of Management and Operational Efficiencies in Technology Adoption**

Critical factors in technology adoption	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
<b>(a) Management and Operations</b>							
i. Investing in a flexible business strategy in order to cope with the changing consumer demands	7.7	76.9	7.7	7.7	0	3.85	0.689
ii. Investing in modern distribution systems	15.4	84.6	0	0	0	4.15	0.376
<b>(b) Staff Competences</b>							
i. Undertaking continuous staff development in order to cope with changing market requirements	23.1	69.2	7.7	0	0	4.15	0.555
<b>(c) Communication and Information Systems</b>							
i. Modernising communication and information and systems	46.2	46.2	7.7	0	0	4.38	0.650
<b>Average</b>	<b>23.1</b>	<b>69.2</b>	<b>5.8</b>	<b>1.9</b>	<b>0</b>	<b>4.05</b>	<b>0.639</b>

The findings were corroborated by the different competitive strategies and tactics to the effect that manufacturers had to employ new strategies to either remain or enter new markets (Porter, 1995; 1998). Some of these strategies included outsourcing, contracting and agency operators. According to available literature, the latest strategies for coping with competition in a globalised business environment entailed



the production of non-reusable products at relatively cheap prices (Prahalad & Hamel, 1990; Teece, 1998; Spulber, 2007). These have been adopted by the larger global companies in the manufacture of phones, computers, among other products.

The findings underscored the urgency for the Kenyan business community to adapt to the changing global production techniques and new global products in order to remain in business. Continuing with the manufacture of traditional products using obsolete technology would put them out of business sooner than later. Since electrical and electronics products/services are among those globally traded and with potential to transform the Kenyan economy, the government has to team up with the private sector in planning for the migration of the sector into the new production systems and processes that include outsourcing/off-shoring in fragmented production systems.

**Table 4.42: Facilitators' Views on the Role of Management and Operational Efficiencies in Technology Adoption**

Critical factors in technology adoption	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
<b>(a) Management and Operations</b>							
i. Investing in a flexible business strategy in order to cope with the changing consumer demands	42.9	57.1	0	0	0	4.43	0.535
ii. Investing in modern distribution systems	57.1	42.9	0	0	0	4.57	0.535
<b>(b) Staff Competences</b>							
i. Undertaking continuous staff development in order to cope with changing market requirements	71.4	28.6	0	0	0	4.71	0.488
<b>(c) Communication and Information Systems</b>							
i. Modernising communication and information and system:	85.7	14.3	0	0	0	4.86	0.378
<b>Average</b>	<b>64.3</b>	<b>35.7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4.59</b>	<b>0.601</b>

**(ii) Modern Distribution Systems**

The study sought to establish the commitments of the stakeholders in prioritising investment in modern distribution systems as part of the coping mechanisms with the changing business environment. All the manufacturers agreed on the need to invest in modern distributions systems, with 15.4% strongly in agreement and 84.6% in agreement (Table 4.41). The respective mean score of 4.15 and SD of 0.376 confirmed the level of agreement. The same enthusiasm was shared by all (100%) facilitators who registered a mean score of 4.57 and SD of 0.535 (Table 4.42). Both the public and private sectors appreciated the role of modern distribution systems in reducing costs and enhancing competitiveness. These findings were consistent with

operational distribution systems in which supermarket distribution networks were on the increase in the urban and the more affluent rural areas. However, the distribution channels in rural Kenya remain traditional, still going through distributors and retailers. These results are aligned to the Porter's Value Chain and Haines customised logistics theories that facilitated management operations. The results also complement a variety of management theories as espoused by the theory of the operational environment.

These findings corroborated the convergence with the modern distribution systems typical of fragmented production systems where minimum stocks are maintained (CSCO, 2011). These include Just-In-Time (JIT) strategies wherein companies employ to increase efficiency and decrease waste by receiving goods only as they are needed in the production process, thereby reducing inventory costs. These were anchored on the supply chain management steeped into information technology (Haines, 2005; 2008). According to the Economic Survey (2012), supermarkets and shopping malls catered for more than 30 percent of retail needs. Online advertising and sales had picked up momentum and captured substantial market shares.

The findings imply that most stakeholders in Kenya now have to maintain websites, which could be upgraded to the next level to make them interactive for online business transactions. With modern distribution systems underpinning the fragmented production systems, the Kenyan business community had confidence in such processes. It would appear that the Kenyan manufacturers would embrace the new arrangements that come with off-shoring production systems when the time comes to participate in them. While modern distribution systems are critical for fragmented

production systems, there was need to investigate their affordability and suitability to the SME manufacturers.

### **(c) Communication and Information Systems**

On ICT, the study evaluated stakeholders' views on the need for the modernisation of communication and information systems in the current business environment of fragmented production systems. Apart from a minority group of 7.7%, manufacturers who were indifferent on modernising the communication and information systems, 92.4% were in agreement (Table 4.41). The mean score of 4.38 for the manufacturers and 4.86 for the facilitators demonstrated the high regard that the stakeholders hold for information and communication systems in business success. Similarly, all the facilitators were in agreement in the modernisation of the communication equipment (Table 4.42). The findings were consistent with the prevailing practice in which most of the manufacturers and facilitating institutions operated websites. These corroborate Porter's and Haines Value Chain theories anchored on trade logistics in improving the operational business environment.

These findings corroborated Sapprasert's (2006) study, which established that both productivity and profitability were significantly linked to the level of ICT intensity. The same conclusion was arrived at by Garicano and Heaton (2010) who, in analysing panel data of criminal activities for the period 1987-2003, established that IT on its own may not solve crime. However, when taken as part of organisational change, there was noticeable productivity improvement. These were consistent with Haines' (2005) theory of customised value chains in which information packaging on the appropriate IT platforms facilitated both business executives' and customers' decision

making. The latest internet technology developments in form of emails, Twitter, YouTube, Facebook, among others, have made communication across the globe instant; enhancing business opportunities for all (Postmes, Spears & Lea, 1999; Orlikowski, 1992).

The findings further indicated that the Kenyan business community, together with the facilitators, were ready to embrace modern communication and information systems as part of their management and operational systems in order to increase productivity and markets. A large proportion of the government operations and service delivery including tax collection and administration are now transacted online. Social media has also taken root among the Kenyan youth in Kenya. Leveraging such skills in the management of business operations should solve many problems.

#### **(d) Staff Competences**

The study explored the role of staff competences in the changing business and market requirements in a globalised business environment. This was to establish the need for continuous staff development in order to cope with advancements in communication, information and transportation to facilitate diverse players. Both the public and private sectors were in near-total agreement on matters of continuous staff development to discharge their duties.

There was strong agreement (92.3%), complemented with a mean score of 4.15 and SD 0.555, among the manufacturers for the need to undertake continuous staff development in order to cope with changing market requirements (Table 4.41). A minority of 7.7% were indifferent. All the facilitators were in consensus with a mean

score of 4.71 and SD of 0.488 on the need for continuous staff training in order to cope with the changing industry requirements (Table 4.42). These findings confirmed the business community's belief in development of skill competences in managing the electric and electronics sector's competitiveness. The results are anchored on the RBV and knowledge management theories defining the operational environment.

As indicated elsewhere in this study, these findings were corroborated with the Kenya government's reviewed education and training policy to equip graduates with skills that meet market requirements (GoK, 2012). This is intended to equip the workforce with the appropriate market-required skills, which currently stand at 50% of the competitiveness efficiencies (World Bank, 2013). According to ECA (1998), international competitiveness was increasingly being defined in terms of the agility to access, learn, adapt, utilise and innovate from available technology. In any case, the more competitive segments of the electrical and electronics sectors were knowledge-intensive (Haughton and Thorborn, 2004).

The findings validated the regular company contributions to the industrial training levy in Kenya. In addition, both the public and private sectors set aside resources for continuous staff development as part of their institutional programmes. More specifically, as the industry transforms and moves up the value chain, skill overhaul shall be mandatory. Further, public sector employees continue to enrol for evening and weekend classes for further training to better their skills.

#### 4.4.2.4 Correlation Analysis—Technology on Competitiveness

Table 4.43 presents the degree of correlation and levels of significance between technology and competitiveness. The findings indicated that the correlation coefficient between technology and competitiveness was 0.466 with a p-value of 0.038 for a 5% 2-tail test. This depicts a positive and significant relationship between technology adoption and competitiveness since the p-value is less than 0.05.

**Table 4.43: Correlation Model Summary—Technology on Competitiveness**

Variable	Coefficient Type	Competitiveness	Technology
<b>Competitiveness</b>	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	20	
<b>Technology</b>	Pearson Correlation	.466	1
	Sig. (2-tailed)	.038	

These results are corroborated by Kaskorda's (2007) study on the role of ICT in industry competitiveness and the justification for professional training in the different aspects of ICT. Similarly, Kajogbola's (2004) research on the impact of technology on the Nigerian economy confirmed the strong correlation between technology and competitiveness of the manufacturing and services sectors. Further, UNCTAD's (2003) case studies on Kenya, Ghana, Uganda and Tanzania in comparison with the Asian countries brought out the respective country technology-gap challenges of low technology adoption and poor policy environment curtailing individual country competitiveness.

The findings of the correlation test confirmed the need for adoption of new modern technology in order to enhance sector competitiveness. The electrical and electronics sector in Kenya stands to benefit from technology upgrading.

#### 4.4.2.5 Regression Analysis—Technology on Competitiveness

Figure 4.8 shows that the distribution of the scatter plot appears to fall along a line and evenly distributed on either side. There is no skewness to either side indicating that there is a constant variance. Therefore, a straight line can be fitted, suggesting that there was a linear relationship between management practices and implementation of strategic plans in the form:  $Y = \beta_0 + \beta_1 X_1 + e$ .

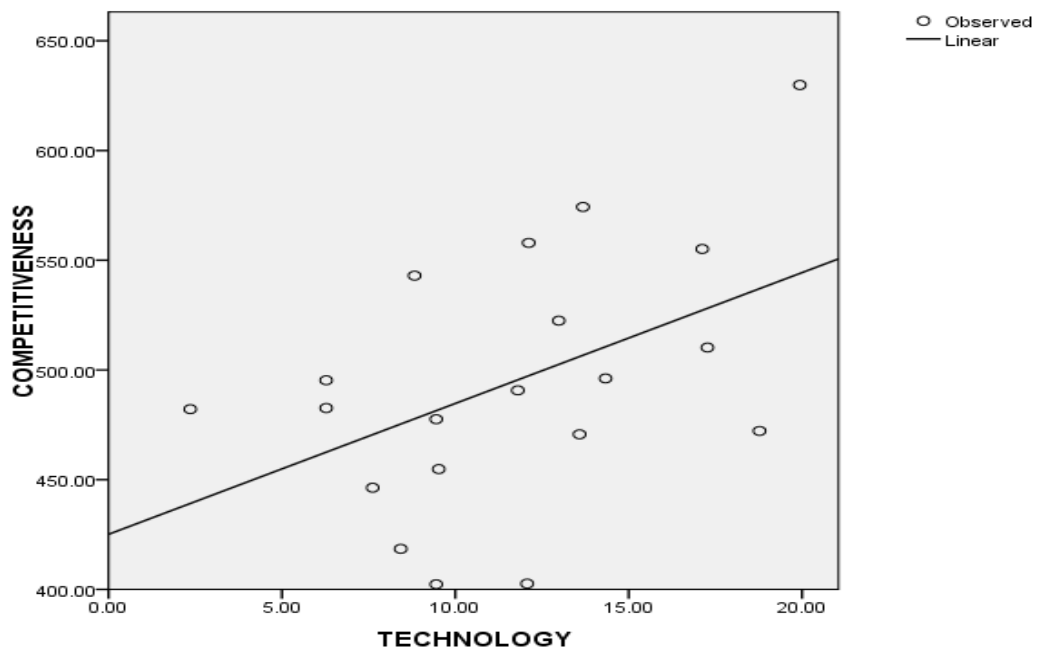


Figure 4. 8: Regression Analysis of Technology on Competitiveness



Table 4.44 presents the goodness of fit of the model  $Y = \beta_0 + \beta_1 X_1 + e$  being the linear model involving technology ( $X_1$ ) as the only independent variable. The coefficient of determination (R Square) of 0.217 indicated that technology on its own in the model explained 21.7% of the variation or change in the dependent variable. The remainder of 88.3% is explained by other factors and variables other than technology.

**Table 4.44: Fitness Test Model Summary—Technology and Competitiveness**

Indicator	Coefficient
R	0.466
R square	0.217
Adjusted R Square	0.174
Standard Error Estimate	52.77455

The findings corroborated Njoga's (2013) case study on the role of technology in improving the efficiency and competitiveness of the Kenya Pipeline Company. The findings implied that the Kenyan electrical and electronics sector can be propelled into modernising its technology in order to gain competitiveness.

#### **4.2.2.6 ANOVA Analysis—Technology on Competitiveness**

Table 4.45 presents the analysis of variance (ANOVA) of the influence of technology on competitiveness of the electrical and electronics sector. The results with a p-value of 0.038 indicated that the model was statistically significant in explaining the impact of technology on the electric and electronics sector's competitiveness in Kenya. In this regard reject the null hypothesis of technology not having an effect on the electrical and electronics manufacturing sector in Kenya. It can, therefore, be concluded that

technology has a significant relationship with the competitiveness of the electrical and electronics sector in Kenya.

The findings corroborated part of Warren-Rodríguez's (2008) Mozambican study on the linkage of technology and enterprise growth, in which technology development played a more decisive role in driving enterprise growth. This was more pronounced in the cluster of firms subcontracting work with the Mozal aluminium smelting plant. Further, Maru, Chepkwony and Menjo (2012) reaffirmed that technology adoption in waste recycling improved the performance of SMEs in Kenya.

The findings underscored the role of fragmented production systems in technology upgrading for enhanced competitiveness. In this regard, Kenyan manufacturers can improve their competitiveness through outsourcing as well as locating in the appropriate clusters. Further, technology applications also enhance SME competitiveness.

**Table 4.45: NOVA Analysis of Technology on Competitiveness**

<b>Model</b>	<b>Sum of squares</b>	<b>Df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
Regression	13907.104	1	13907.104	4.993	.038
Residual	50132.765	18	2785.154		
Total	64039.870	19			

Table 4.46 presents the model coefficients of the regression results of technology on competitiveness in the Kenyan electrical and electronics sector. With a significant constant value (p-value=0.000) of 425.111, the study concluded that even without technology, the sector depicted some level of competitiveness.

**Table 4.46: Model Coefficients –Technology on Competitiveness**

<b>Model</b>	<b>Unstandardized Coefficients</b>		<b>Standardised Coefficients</b>		<b>Sig.</b>
	<b>B</b>	<b>Std. error</b>	<b>Beta</b>	<b>t</b>	
Constant	425.111	33.109		12.840	.000
Technology	5.962	2.668	.466	2.235	.038

The gradient coefficient indicated the extent to which a unit change in the independent variable causes a change in the dependent variable; that is the change in competitiveness due to a unit change in technology. The gradient coefficient from Table 4.46 was positive indicating that a unit change in technology lead to 5.962 units of positive change in competitiveness of the electrical and electronics sector. This meant that technology was significant (p-value=0.038) in positively influencing competitiveness of the electrical and electronics sector in Kenya.

With a constant of 425.111, the model estimate for technology competitiveness reads as follows:

$$Y = 425.111 + 5.962X_1$$

These findings corroborated the United Kingdom's (UK's) review of various sectors, which heightened competitiveness associated with globalised value chains (BIS, 2010). More importantly, those global value chains engaged in continuous technology upgrading and adoption for purposes of modernisation to meet changing consumer preferences (BIS, 2010). The UNCTAD (2002) report reaffirms the sustained movement in world exports towards the growing significance of a limited number of products associated with high-intense technology. The results were further

corroborated by Aduda's and Kingoo's (2012) findings in which adoption of ATM technology improved returns in the banking sector in Kenya.

The implications of these findings point to the need for intensified technology upgrading in global products, which include, among others, electrical and electronics products. Kenya needs to take the decisive position of establishing linkages with multinationals so as to integrate into the global value chains and benefit from global markets.

### **4.4.3 Role of Innovation in Stimulating Electrical and Electronics Sector's Competitiveness**

The second objective, establishing the role of innovation in stimulating the electrical and electronic manufacturing sector's competitiveness, explored the innovative ways in which firms developed and invested in new products, services and processes in a competitive environment. Information sought from the stakeholders covered knowledge acquisition, R&D investments, information access, shares of new products/services and the complementary human resource development for competence enhancement.

#### **4.4.3.1 Factor Analysis—Innovation**

A total of 24 items were subjected to factor analysis on innovation. In line with Henson's and Roberts' (2006) minimum threshold of 0.7; 6 out of 24 items as presented in Table 4.47 qualify for further analysis to establish the contributions and significance of innovation in the electrical and electronics manufacturing sector's competitiveness. Information access had a strong bearing on innovation and forms the basis of the analysis. However, the items dropped from the analysis because they did not meet the threshold of 0.7 included knowledge acquisitions, development of new products and R&D.

Both qualitative and quantitative analysis was carried out to establish the stimulating effect of innovation on the electrical and electronics sector's competitiveness. The aspects of the contributions of skill competences to innovation were complemented with qualitative analysis on the identification of current and potential skill gaps. The

implications of the findings and potential interventions were reflected on at every stage of the analysis.

**Table 4.47: Factor Analysis of Innovation**

Component	Loading
<b>1. Knowledge Acquisition</b>	
Knowledge sharing and learning	0.479*
R&D for knowledge and continuous renewal	0.304*
Development of human capital to bring new ideas	0.042*
<b>2. Development and Share of New Products and Services</b>	
Value addition	0.052*
Branding	0.474*
IT-facilitated communication networks for coordination and collaboration	0.558*
<b>3. Research and Development for Renewal</b>	
Internal resources (e.g. funded from sales revenue)	0.232*
Alliances and cooperative arrangements (e.g. R&D cooperatives)	0.564*
R&D Institutions, universities	0.570*
Government programmes and grants	0.065*
R&D tax concession	0.230*
Subcontracting from other firms	0.487*
<b>4. Information Access</b>	
<b>a. In-house</b>	
In-house R&D group	0.310*
Other internal sources (e.g. existing employees)	0.232*
New employees	0.768
<b>b. Partnerships</b>	
(i) R&D institution, university	0.570*
(ii) Government ministry and institutions	0.070*
(iii) Professional or industry associations	0.819
(iv) Suppliers	0.791
(v) Customers	0.771
<b>(c) Conferences and Publications</b>	
(ii) Professional publications & journals	0.555*
(iii) Trade and industry magazines	0.624*
(iv) Discussions at conferences & trade shows	0.777
(v) Discussions at industry networking functions	0.729

\*Items with less than 0.70 factor loadings upon rounding off.

#### **4.4.3.2 Information Access on New Innovations**

The study interrogated the different information sources for new innovations. These were analysed under three broad categories of partnerships, conferences and publications and staff skill competences.

##### **(a) Partnerships**

The analysis in Table 4.48 indicated that 84.6% (mean score 3.92) of the respondents agreed on the need for partnerships with professional or industry associations to access information on new innovations. The mean score of 3.92 underscored the general agreement in spite of the variation of views from the SD of 1.032. A minority group of 7.7% disagreed with engaging in partnerships with professional or industry associations to access information on new innovations. Partnerships with suppliers and consumers for information access were equally well rated by 84.6% of the respondents. The remainder of 15.4% were neutral. None of the respondents disagreed with this consumer/supplier partnership for information access. The high perceptions validate the GCI innovation index of 60%, where Kenya was among the top 50 countries with high acumen on innovation.

These findings are consistent with innovation theories of diffusion, where partnerships through peers and networks facilitate ease of information exchange on new innovations. These correspond to Porter's Five Forces and value chains competitiveness models; in which information on new innovations can be passed through new products from substitutes or new entrants. Partnerships appear to be the easier avenues for accessing information on new innovations.

In spite of the high ranking on innovation in which Kenya was among the top 30% countries, the manufacturing practise on the ground was not aligned to the general paradigm shift of moving segments of business around the globe to gain efficiency. The general agreement on partnerships had not translated into technology transfer. Developing country producers, Kenya included, still face challenges of upgrading their production infrastructure to levels comparable to those in the GVCs (UNIDO, 2009). Furthermore, non-market and non-economic factors (political or cultural) also come in the way of partnerships (Thornton, 2011). The fragmented production systems enable firms to break down into business functions that enhance efficiency and competitiveness (Yagahouti, Moradi & Tajamohammadi, 2011).

The implications of the findings were that there was urgency in addressing the non-market challenges impacting negatively on partnerships. Intensified research on designs is most often carried out by institutions that are separate from those that commercialise them. Research on new technology remains a very expensive undertaking. Partnerships would allow MNCs/TNCs to locate and take up partnerships with local firms since the regional markets offer better prospects. However, the unique challenge of family ownership would still get in the way. Under this scenario, it would be prudent for the government to review the investment framework to make it attractive for investors to locate in Kenya for purposes of serving the region.



**Table 4.48: Source of Information on New Technological Developments**

Partnerships	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
<b>(a) Partnerships</b>							
(i) Professional or industry associations	23.1	61.5	7.7	7.7	0	3.92	1.038
(ii) Suppliers	30.8	53.8	15.4	0	0	4.14	0.689
(iii) Customers	15.4	69.2	15.4	0	0	4.00	0.577
<b>i) Conferences and publications</b>							
(i) Discussions at conferences & trade shows	23.1	61.5	15.4	0	0	4.00	0.707
(ii) Discussions at industry networking functions	30.8	53.8	15.4	0	0	4.00	0.707
(iii) New Employee	7.7	53.8	30.8	7.7	0	3.62	0.768
<b>Average</b>	<b>21.8</b>	<b>58.9</b>	<b>16.7</b>	<b>2.6</b>	<b>0</b>	<b>3.95</b>	<b>0.748</b>

**(b) Conferences and Publications**

As presented in Table 4.48, conferences were some of the preferred modes of accessing information on new technology. Over 80% of the respondents agreed with disseminating new information through discussions at conferences and trade shows and industry networking functions. A minority group of 15.4% were indifferent. Discussions at industry network functions carried stronger value for the Kenyan business community with 84.6% in agreement and the remainder of 15.4% being indifferent. None disagreed. The mean score of 4.00 and SD of 0.707 underscored this commitment. The results confirmed that new innovations are either disseminated at conferences, sector networking functions or through publications. These findings are consistent with the diffusion innovation theory, Porter's Five Forces and value chain on matters of introducing new innovations that uphold competitiveness.

Consistent with the government's open data policy on information access as guaranteed in the Constitution (2010), most government departments have uploaded pertinent information on their websites. Indeed, Kenya was among the first sub-Saharan African (SSA) countries to adopt the open data initiative. The results further corroborated Haines' (2005) contestation of packaging of information content for different stakeholders along the value chain.

The implications of the study findings were that the Kenyan electrical and electronics sector did not appear to take full advantage of the power of the internet as a marketing platform. The mandatory information disclosure in the public sector ensured that departmental researches were made public, leaving no choice for the business community to engage on the same platform. The continued dependence on round-table discussions was characteristic of an industry that is underdeveloped.

### **(c) New Employees**

The research findings demonstrated the role of employees in acquisition of new innovations. In particular, 61.5% of the new employees with a mean score of 3.62 made a significant contribution on sources of information for new technology (Table 4.48). From these results, it would appear that manufacturers could recruit specialised talent in accessing information on new technology. The results are consistent with the diffusion innovation theory and Porter's Five Forces of competitiveness.

These findings corroborated Robinson's (2009) transmission theory of peers and networks in which both existing and new staff, whether in the research department or not, share knowledge on possible innovation information sources. The views from

the minority groups seemed to be aligned with views shared by Callon (1991) and Latour (1997) wherein the environment in the form of culture and competitiveness dictated information sources. In addition to leveraging existing technologies, the Kenya Science, Technology and Innovation Policy (2013) prioritised development of endogenous Science, Technology and Information (ST&I) capacities appropriate to national needs. In particular, new ways of exploiting cultural technologies were among the key intervention priorities in the ST&I policy.

With universal access to the internet, it is possible for most of the staff to check out the status of different types of innovations in any industry. However, few staff, in the relevant professional fields could check out the latest technology in the related industry. Nevertheless, from the above analysis, the interest for searching for relevant information technology was limited to a few members of staff. It was prudent that dedicated professional staff are recruited to manage the technology departments in both firms and facilitating institutions.

#### **(d) Human Resource Development**

Alternatively, firms can also build internal staff capacities and leverage the same for innovation purposes. This was analysed qualitatively in the context of existing skill competences and skill gaps with a view to identifying immediate and future needs and either plan for training or direct recruitment. In the absence of reliable labour information, the firm skill complements with the potential to impact on innovation were analysed in the context of the proportions of firm revenues set aside for the wage bill and contract services.

**(i) Wage Bill**

As presented in Table 4.49, the majority (61.5%) of the manufacturing firms did not disclose their wage bill. Of the remaining respondents, 7.7% used between 5 and 10% of their revenue on the wage bill, 23.1% used 10 to 20% while 7.7% used in excess 20% of the firms' revenues. There was minimal use of contract services. The majority (69.2%) of the firms did not contract out any services. The minimal services contracted out accounted for less than 28.2% of the firms' wage bill. The results are indicative of an industry where all the work was done in-house by full-time employees. The low wage bill is a demonstration of the production of commodities calling for low-skill complements. These findings are consistent with Haughton's and Thorborn's (2004) dimensions of classifications of order of electronics in which low technology and knowledge intensity products or services required low-skilled competences and are less competitive.

As stated earlier, these results were consistent with an SME-based low technology-intensive industry (McCormick & Onjala, 2007; Haughton and Thorborn, 2004). The results are also consistent with an industry with no partnerships by way of contracted services (Yagahouti, Moradi & Tajamohammadi, 2011).

For a labour-intensive industry, the low proportion of the wage bill was an indication of simple assembly-production-related work requiring low-labour-technical skills. In this regard, this industry had a long way to go in order to join the league of globally-competitive firms in the electrical and electronics sectors. There was need to initiate partnerships with better-endowed investors. There was also the possibility that most

of the firms employ part-time workers and that was why they did not disclose their wage bills.

**Table 4.49: Proportion of Firm Revenue Dedicated to Wages and Contract Services**

% Contribution to wage bill	Wage bill		Contract services	
	No.	%	No.	%
Not stated	8	61.5	9	69.2
Less than 5%	0	0	1	7.7
5-10%	1	7.7	1	7.7
10-20%	3	23.1	1	7.7
>20%	1	7.7	1	7.7
<b>Total</b>	<b>13</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>

**(ii) Skills Gaps**

A large set of skills gaps were reported in different professions (Table 4.50). In relation to the present shortages in comparison with future expectations, the skills requirements were in the ratio of 37 to 28. Marketing (24.3%) and professional skills (21.6%) were the skills most frequently reported in short supply during the survey period. People management (13.5%), technical support (11.4%) and business support skills (10.8%) had the least skills gaps. However, business support services (32.1%) and management (28.6%) were anticipated to be in short supply in future. Lower shortage of skills gaps were anticipated in marketing (14.3%) and technical support services (7.1%) in future. For the recruitment of every two employees now, one more employee should be recruited in the near future to meet the anticipated increased demand. In order to address the skill gaps, 76.9% of the firms had an education and training policy (Figure 4.9). Given the anticipated increased employment, the results gave the indication of a growing industry. The findings in this section are aligned to

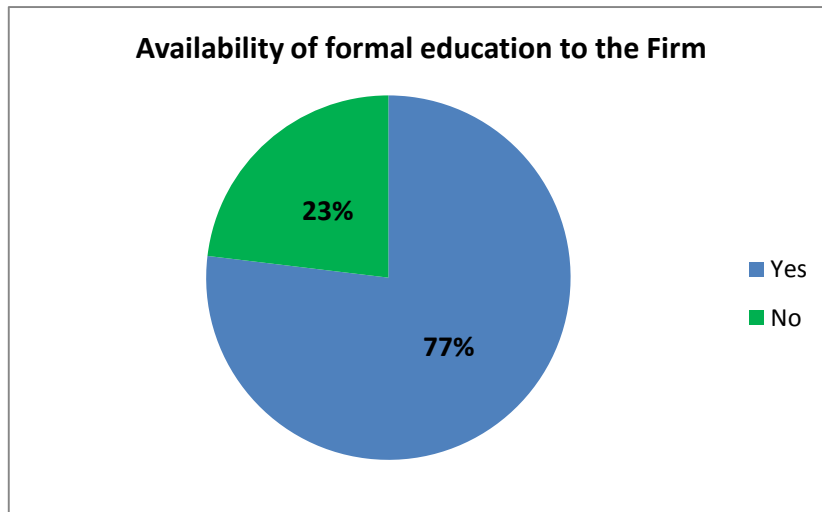
RBV and knowledge management models and Porter's Five Forces of competition in as far as firm strategy is concerned.

The skills gap challenge was corroborated by both government and private sector complaints on the shortage of workers and inadequacy of skill competences for the job market [GoK & the United Nations Development Programme (UNDP), 2012; GoK, 2007]. In spite of the 9,600 fresh IT graduates into the workforce in 2012, the AITEC East African ICT Summit on 24<sup>th</sup> October, 2012, reiterated the need to retrain the same for use in industry (AITEC Summit, 2012). According to one of the industrialists, Budhabatti, skill shortages were more acute at the senior level, leaving the industry with no option but to hire from abroad. Kenya was witnessing soaring demand for IT professionals skilled in web-based and mobile application development, who could work with sophisticated analytics to improve business intelligence (AITEC Summit, 2012). In addition to setting up accreditation institutions to link academia with industry, the government has gone a step further in establishing the Konza Technology City to spearhead transformation into a knowledge economy.

Since both the government and the private sector were aware of the skills challenges, proactive action in the Education Act (2013) was making adequate preparations for the same. The establishment of the different cadres of technical training at the polytechnics at village, county and university level will go a long way in addressing the skills gaps. However, industry-specific training and attachments assist in grounding the students on the skills that the industry is in need of.

**Table 4.50: Skills Gaps by Skill Type**

Skill type in short supply	Presently		Future		Ratio of future to present
	No.	%	No.	%	
i) People management skills	5	13.5	8	28.6	1:2
ii) Professionals (IT programmers, engineers, etc.)	8	21.6	5	17.9	2:1
iii) Business, finance & administration skills (incl. IT)	4	10.8	9	32.1	1:2
iv) Technical, professional & engineering skills	11	11.4	2	7.1	5:1
v) Marketing & sales skills	9	24.3	4	14.3	2:1
<b>Total</b>	<b>37</b>		<b>28</b>		<b>2:1</b>



**Figure 4. 9: Availability of Formal Education to the Firm**

**(iii) Recruitment of Critical Staff Categories**

Recruitment of new staff with skills in short supply was the preferred mode to remedy critical skills gaps. With the reported skills gaps, all the manufacturers interviewed reported to have recruited additional staff in 2011 (Table 4.51). The highest proportion (32%) of employee with a mean score of 24.31 and SD of 35 of additional staff were

recruited to fill positions in the technical and trade skills departments. Additional staff were also recruited among the production (16.5%) and professional (12.8%) cadres. The least recruitment was at senior level management (6.7%) and clerical staff (6.8%). On average, most of the manufacturers recruited additional 12.5% or 9 employees to add to the staff complement in 2011. The results confirmed the availability of job opportunities across the different cadres in the electrical and electronics manufacturing sector in Kenya. The RBV and knowledge management models support the above analysis.

**Table 4.51: Staff Categories Recruited in 2011**

<b>Staff categories recruited</b>	<b>%</b>	<b>Mean score</b>	<b>SD</b>
i) Senior managers	6.7	5.08	3.904
ii) Professionals (IT programmers, engineers, etc.)	12.8	9.69	12.592
iii) Technically qualified manufacturing, production & trades persons	32.0	24.31	34.984
iv) Unqualified manufacturing, production & trade persons	16.5	12.31	17.051
v) Store persons, transport workers, etc.	9.1	6.92	13.419
vi) Sales, marketing and customer service	12.9	9.85	13.545
vii) Business support professionals (e.g. accountants, auditors, etc.)	3.2	2.46	2.787
viii) Clerical	6.8	5.23	4.438
<b>Average</b>	<b>12.50</b>	<b>9.48</b>	<b>12.840</b>

The findings were corroborated with the Economic Survey (2012) in which the sectors that created the highest job opportunities were in communication, transport, financial intermediation and manufacturing (KNBS, 2011; World Bank, 2011). In line with the Constitution (2010), every Kenyan is guaranteed employment. Consequently, the



Jubilee Coalition government (2013) in its manifesto with regard to Securing Kenya's Prosperity (2013-2017), promised the creation of one million jobs yearly.

From past experience, the informal sector created the highest number of jobs. Additional jobs in the formal sector depended on government policy in creating a conducive business environment. The youth need to establish the skills in short supply in the market and prepare for them. The training programmes should take on board industry requirements to avoid the bulging unemployment from educated youth in skills not required in the market. In addition, the public wage bill, which keeps on increasing annually through minimum wage promises, might curtail further investments.

#### **(e) IT-Facilitated Platforms**

The study also explored how IT-assisted management systems including e-business platforms and communication networks assisted in the development of new products and services and the related implementation processes. It established that close to 70% of the manufacturers believed e-business platforms and IT-management systems played a role in their business success (Table 4.52). With 23.1% being indifferent, only a minority group of 7.7% disagreed with the role of e-business platforms and IT-facilitated management systems in business success. The mean score of 3.85 and SD of 0.899 for e-business/IT platforms and mean score of 3.92 and SD of 0.952 for communication networks confirmed the possibility of convergence of the manufacturers' views tending to general agreement. Nevertheless, facilitators' positions (Table 4.52) were categorical in agreement, with 85.8% in agreement and a mean score of 4.29. The findings indicated that regardless of the minor divergent

views among the manufacturers and the facilitators, both parties took ICT-facilitated platforms seriously in management, communication and coordination.

**Table 4.52: Stakeholders' Views on Factors Contributing to Innovation**

<b>Factors contributing to innovation</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
i) Manufacturers' views on IT-facilitated communication networks for coordination and collaboration	30.8	38.5	23.1	7.7	0	3.92	0.954
ii) Facilitators' views on IT-facilitated communication networks for coordination and collaboration	42.9	42.9	14.3	0	0	4.29	0.756
<b>Average</b>	<b>38.9</b>	<b>40.7</b>	<b>18.7</b>	<b>3.9</b>	<b>0</b>	<b>4.11</b>	<b>0.855</b>

These findings corroborated Sapprasert's (2006) study on the impact of ICT on the growth of the service industry, which demonstrated that IT-facilitated networks drive the goods industry. Haines (2005) confirmed the critical role of IT information platforms in easing communication across the different stakeholders along the value chain. McDade's and Spring's (2005) study on the New Generation of African Entrepreneurs established the importance of IT-facilitated networks in the success of 57 businessmen across 10 African countries. Similarly, the study by Mas et al. (2009) on the economics of M-Pesa in Kenya also confirmed the role of IT in cost reduction and improved access to services.

The findings implied that IT-facilitated platforms consisting of e-business platforms, management and communication networks had picked up momentum in Kenya. With the positive lessons from the internet and mobile telephony, the Kenyan business community was ready to embrace IT-facilitated operations in managing their businesses. In fact, many are likely to be willing to invest in order to either generate new business lines or reduce costs of operations. In spite of the failed IT-assisted Kenyan electoral processes in 2013 (Reuter, 2013), the media, with the help of the same IT platforms, kept Kenyans informed all through.

#### 4.4.3.3 Correlation Analysis—Innovation on Competitiveness

The analysis presented in Table 4.53 indicated the degree of correlation and levels of significance between innovation and competitiveness. The findings indicated that the correlation coefficient between innovation and competitiveness was 0.623, with a p-value of 0.003. This meant that 62.3% of the variations on competitiveness were explained by innovation. The remaining 27.7% was explained by other factors. This depicted a strong and significant relationship between innovation and competitiveness for the electrical and electronics sector.

**Table 4.53: Correlation Analysis: Innovation and Competitiveness**

Variable	Coefficient Type	Competitiveness	Innovation
<b>Competitiveness</b>	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	20	
<b>Innovation</b>	Pearson Correlation	.623	1
	Sig. (2-tailed)	.003	
	N	20	20

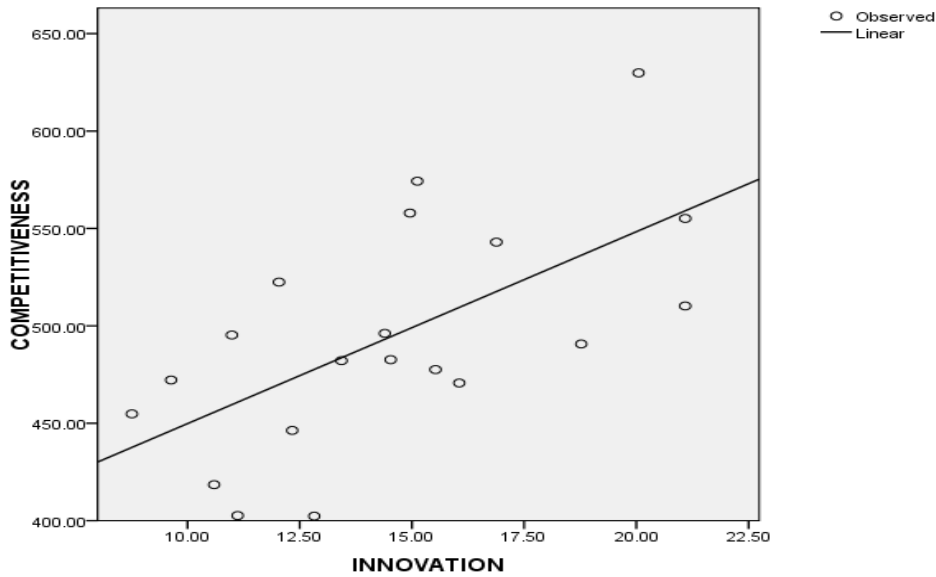
The findings corroborated Njoga's (2013) study on effective management, which recommended that KPC should encourage more of its employees to further their education by enrolling in institutions of higher learning and tertiary colleges in order to achieve the required development objectives and the range of competences needed. The findings also corroborated Mwangi's (2011) study on enhancing competencies of electronics craftsmen in the informal sector in Kenya. The study further established that those entrepreneurs with higher technical/vocational education tended to excel in their operations, which made their products more competitive.

The findings confirmed the need for knowledgeable and skilled staff in the electrical and electronics sector if competitiveness is to be guaranteed. In this regard, more openings should be added in technical colleges for upgrading the skills of those in employment. The establishment of village polytechnics, as highlighted in the new Education Act, is a step in the right direction.

#### **4.4.3.4 Regression Analysis—Innovation on Competitiveness**

From Figure 4.10, the distribution of the scatter plots seem to fall along a line, indicating that there is constant variance. There appeared to be no skewness to either side, since the points were evenly scattered on either side. Therefore, a straight line can be fitted along these scatter points suggesting that there is a linear relationship between management practices and implementation of strategic plans in the form:

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



**Figure 4. 10: Regression Analysis—Competitiveness and Innovation**

The goodness of fit model  $Y = \beta_0 + \beta_1 X_1 + e$ , presented in Table 4.54, involving innovation ( $X_1$ ) as the only independent variable appeared to be linear. The coefficient of determination (R square) of 0.388 indicated that the model explained 38.8% of the variation or change in the dependent variable. This meant that innovation on its own could explain only 38.8% of the variation in the competitiveness of the electrical and electronics sector. The remainder of 61.2% of the variations in the electric and electronics sector’s competitiveness was explained by other factors. The adjusted R square reduced the coefficient of determination to 0.354. This meant that, in holding the constant at zero, only 35.4% of the variations in competitiveness were explained by innovation. This was not very different from the R square variation of 0.388.

**Table 4.54: Goodness Fit Model Summary:—Innovation on Competitiveness**

<b>Indicator</b>	<b>Coefficient</b>
R	0.623
R square	0.388
Adjusted R square	0.354
Standard error estimate	46.66287

#### **4.4.3.5 ANOVA Analysis—Innovation on Competitiveness**

The ANOVA analysis in Table 4.55 presents the influence of innovation on the competitiveness of the electrical and electronics manufacturing sector. The results with a p-value of 0.003 indicated that the model is statistically significant in explaining the impact of innovation on the electrical and electronics sector's competitiveness in Kenya. Therefore, reject the null hypothesis that innovation has no effect on the electrical and electronics manufacturing sector's competitiveness.

**Table 4.55: ANOVA Analysis of Competitiveness and Innovation**

<b>Model</b>	<b>Sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
Regression	24846.245	1	24846.245	11.411	.003
Residual	39193.624	18	2177.424		
<b>Total</b>	<b>64039.870</b>	<b>19</b>			

Table 4.56 presents the regression results of innovation on competitiveness of the Kenyan electrical and electronics manufacturing sector. With a significant constant (p-value = 0.000) of 351.288, the study concluded that even without innovation, the electrical and electronics sector displayed some form of competitiveness.

Against a constant of 351.288, the model estimate for innovation on competitiveness is of the form:

$$Y = 351.288 + 9.853X_2$$

The findings corroborated Kleynhans's (2006) study evaluating the role of human capital in the manufacturing sector's competitiveness. It established that the level of human capital in South African industries was much higher than the general perception though there were challenges of absenteeism due to AIDS and other factors. There were also shortages of artisans with proficiency in modern technology and innovation, which limits competitiveness (Kleynhans, 2006). Similarly, the research carried out on the US economy established its growth correlated closely with human capital competences of the 20<sup>th</sup> century (USDC, 2012).

The study highlighted the critical role of the quality of human capital in sustaining competitiveness. As such, there was need for continuous training in order to sustain high levels of innovation. In this regard, the Kenyan electrical and electronics manufacturing sector has to invest in human capital development and R&D in order to sustain competitiveness.

**Table 4.56: Model Coefficients: Innovation on Competitiveness**

Model	Unstandardized coefficients		Standardised coefficients		
	B	Std. error	Beta	t	Sig
Constant	351.288	43.585		8.060	.000
Innovation	9.853	2.917	.623	3.378	.003

#### **4.4.4 Role of Regulations in the Electrical and Electronics Sector's**

##### **Competitiveness**

The third objective in the study was to determine if the regulatory frameworks had a role in stimulating Kenya's electrical and electronics enterprises' competitiveness. Against a fully-liberalised economy, the study obtained information related to the impact of multilateral trade and investment agreements, complementary policy and regulatory frameworks. In addition, information on the effects of globalisation on the business environment in as far as it impacted on the performance and competitiveness of the electrical and electronics manufacturing sector was obtained.

##### **4.4.4.1 Factor Analysis— Regulations**

In line with Henson's and Roberts' (2006) threshold of 0.7, only 3 items out of 22 qualified for further analysis (Table 4.57). These covered environmental and governance issues. Policy and regulatory frameworks did not qualify on the basis of the 0.7 threshold and were dropped from further analysis. These findings are consistent with the WTO market-based policies in which substantial liberalisation have taken place and technical market requirements standardised across the globe. As such, the role of regulations is peripheral to competitiveness.



**Table 4.57: Factor Analysis—Regulations**

<b>Component</b>	<b>Loading</b>
<b>1. Multilateral agreements</b>	
a) Trade and investment regional/international agreements for private sector	0.304*
b) International commitments on environment protection laws have improved product safety	0.869
c) International commitments on labour have stabilised labour costs	0.604*
d) International requirements on recycling work in Kenya	0.776
e) Market access to EU market is for agricultural products	0.561*
<b>2. Complementary business environment</b>	
a) Trade facilitation	
i. Standardisation of rules and procedures (laws) has improved competition	0.256*
ii. Standardisation processes benchmarked to international best practice provide motivation to investors	0.266*
b) Trade remedies	
i. Anti-corruption laws are working	0.365*
ii. Counterfeit regulations work in a market economy	0.143*
iii. Anti-dumping laws have impact at firm level	0.547*
<b>3. Policy and Regulatory frameworks</b>	
a) Policy	
i. Deregulation has resulted in lower consumer prices making local products uncompetitive	0.215*
ii. Stability of macroeconomic and fiscal policies have intensified competition from increased consumer varieties	0.637*
iii. Incentive schemes are selective targeting foreign investors	0.649*
b) Governance	
i. Private property rights systems have encouraged foreign investors	0.512*
ii. Consumer protection rights facilitate customer access to cheap products	0.345*
iii. Private sector self-governance rules have improved competition	0.746
c) Capacity building	
i. Public sector capacity to enforce laws and regulations	0.079*
ii. Capacity to meet technical market requirements	0.052*
iii. Institutional structures for policy implementation	0.014*
d) Reform proposals	
i. Competition from lower tariff imports	0.005*
ii. Meeting changing customer tastes	0.015*
iii. Competition from Chinese and Asian imports	0.023*
iv. Meeting changing customer tastes	

\*Items with thresholds less than 0.7 upon rounding off.

#### **4.4.4.2 Multilateral Agreements**

The critical multilateral agreements investigated covered international environmental protection including recycling policies and regulations. Issues on multilateral trade and investment agreements, international labour laws and market access were dropped from further analysis.

##### **(a) Environmental Protection Laws**

The views on environmental protection laws were analysed separately for manufacturers and trade-facilitating institutions. The manufacturers' general agreement (69.2%) give credence to the positive effect that international commitments on environmental protection had in improved product safety and business operations (Table 4.58). The creation of uniform environmental laws within which both local and international producers compete ensures fair competition. However, 30.8% of the manufacturers were indifferent either because they had no idea or they were engaged in non-competitive products; on which environmental laws were hard to apply. Further, the mean score of 3.69 complemented with an SD of 0.480 underpinned the low perceptions from the manufacturers on the role of environmental protection laws on business performance.

Correspondingly, 85.7% of facilitators with a mean score of 3.71 and an SD of 1.254 confirmed that the facilitators had similar views on the role of environmental protection laws on businesses (Table 4.56). The findings indicated that the manufacturers' and facilitators' perceptions were on the borderline and as such they were not likely to enforce environmental protection laws. These findings are

consistent with Porter's Diamond in which governments can vary policies and regulations to impact on market access.

**Table 4.58: Stakeholders' Views on the Impact of Multilateral Trade and Investment Agreements on Business Performance**

Multilateral trade and investment agreements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
<b>a) Manufacturers' views:</b>							
i. International commitments on environmental protection laws have improved product safety	0	69.2	30.8	0	0	3.69	0.480
<b>b) Facilitators</b>							
ii. International commitments on environmental protection laws have improved product safety	14.3	71.4	0	0	14.3	3.71	1.254
iii. International requirements on recycling work in Kenya	0	28.6	42.9	14.3	14.3	2.86	1.069
<b>Average</b>	<b>4.8</b>	<b>56.4</b>	<b>24.7</b>	<b>4.8</b>	<b>9.6</b>	<b>3.42</b>	<b>0.935</b>

These findings are corroborated by the US Office of Technology Assessment in which the role of regulations is reviewed continuously in anchoring technology changes impacting on economic activities in policy scenarios to ensure continued engagement in the global business (Mongeau & Stoddard, 1992). On the basis of the global Environmental Performance Index (EPI) (2012) while taking into account a ten-year trend and snap performances, Kenya was ranked No. 83; falling in the group of

modest performers. This was in spite of an existing Environment Act No. 8, which has been in operation since 1999 (KLR, 1999).

The results imply that both the manufacturers and the facilitators did not take environmental issues seriously. Kenya stood to lose out on market access since environmental issues were increasingly being used at the global level for exclusion on market access. Further, since Kenya's is primarily an agricultural-based economy, every effort should be made to enforce the agreed operational action plan for implementing the environmental policy and Act. In particular, since most manufacturers are located in urban areas, the government through NEMA, city/municipal/county councils, must put in place effective mechanisms for refuse and industrial waste management.

#### **(b) Recycling for Environmental Protection**

Apart from the 23.1% manufacturers who agreed and held the view that the international requirement on recycling worked in Kenya, the remainder were either indifferent (69.2%) or disagreed (7.7%) with the notion (Table 4.58). The mean score of 3.15 was consistent with the indifference rating of 3 on the likert scale (1-5). The SD of 0.555 demonstrated the convergence of ideas among the manufacturers. The facilitators, on the other hand, had divergent views on the basis of an SD of 1.069 (Table 4.58). Nevertheless, 28.6% of the facilitators agreed on recycling for environmental protection. The majority (42.9%) were neutral while the remainder 28.6% disagreed. This was consistent with the mean score of 2.86 pointed to the direction of indifference. The results gave the indication that there appeared to be low

knowledge among the Kenyan electrical and electronics sector stakeholders on the value of recycling electronics for environmental protection.

These findings were consistent with Mureithi's and Wanjira's (2008) baseline study on the establishment of e-waste management in Kenya, which confirmed that 10% of computers and accessories were disposed of, in total disregard to their impact on the environment. Since the computers and accessories are not biodegradable, they pose serious challenges to the environment. The East African Recycling Facility, with the support of HP in 2010, recycled over 160,000 tonnes of computer hardware and accessories from returned used HP ink and LaserJet toner cartridges. Ejiogu's (2013) study on e-waste management from the Nigerian perspective highlights the need for appropriate regulations in an industry where demand for second-hand electrical and electronics products is very high.

The results gave the indication that awareness on recycling seemed not to have taken root in Kenya. Further, recycling remained project-based or individual enterprise-influenced. In part, the use of second-hand products contributes to the high e-waste discharge. Environmental protection does not appear high on the agenda of the business community in Kenya. There is urgency in making recycling a business through appropriate incentives and regulations.

Stronger views on environmental requirements were held by the facilitators. All (100%) facilitators concurred that environmental protection improved product safety. However, a smaller proportion of 28.6% agreed that international requirements on

recycling had worked in Kenya. The remainder of 42.9% were neutral while 28.6% were in disagreement.

### **(c) Governance**

Governance, as an integral component of the market economy, consists of laws and regulations to govern the behaviour of the different players in the market place. Self-governance among private sector players was the only factor that qualified for further analysis on the basis of the threshold factor loading of 0.7. The remaining factors of laws and regulations governing consumer protection and property rights were dropped.

Only 46.2% of the manufacturers were in agreement that private sector self-governance rules had improved competition. Nevertheless, there seemed to be low enthusiasm on self-governance (Table 4.59). A similar proportion of 46.2% remained neutral with a further 7.7% in disagreement. The mean score of 3.46 and SD of 0.776 confirmed the ambiguity. Similarly, the public and private sector facilitators seemed undecided on matters of self-governance rules in the context of competition based on the mean score of 3.57 and SD of 0.976 (Table 4.59). This was in spite of the 57.2% agreement on private sector self-governance having improved competition. The results point to an industry that was not ready to take on self-governance in order to comply with pertaining market requirements. These findings are aligned to Porter's Diamond on issues of firm strategy and RBV in connection with efficient use of resources available to the firm; the net effect being enhanced competitiveness.

**Table 4.59: Stakeholder' Views on the Impact of Governance on Business Performance**

Impact of governance on regulations and business performance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Manufacturers' views on private sector self-governance rules having improved competition	7.7	38.5	46.2	7.7	0	3.46	0.776
ii) Facilitators' views on private property rights systems having encouraged foreign investors	14.3	28.6	42.9	14.3	0	3.43	0.976
<b>Average</b>	<b>11.0</b>	<b>33.6</b>	<b>44.6</b>	<b>11.0</b>	<b>0</b>	<b>3.45</b>	<b>0.876</b>

These findings were divergent from global best practice. Against a liberalised environment, independent regulators, some of who are from the private sector, play a crucial role regarding market entry and investment decisions (ITU, 2002). The global governance challenges in the financial sector, in particular, as demonstrated through the Enron, credit crunch and Euro crises confirm the need for regulations and independent regulators to enforce self-regulating rules (Thornton, 2011). Nevertheless, in Kenya, a number of regulators operating from respective Acts like the Communications Act (1998) (KLR, 2009), the Energy Regulator Act (ERC, 2006) and the Competition Act (2010) (KLR, 2010) were doing well. The quality control and anti-counterfeit laws were protecting both the industry and consumers.

The findings imply that the Kenyan electrical and electronics sector was not ready for fragmented production systems. The stakeholder indecision on matters of private self-governance does not sit well in an industry that is continuously changing; with new products of different specifications coming into the market. Manufacturers, especially

those in a fragmented production system, have to subscribe to very strict codes of standards. There was also the possibility that the institutions supporting the manufacturing sector were not competent. It will be prudent to leverage existing local and international regulatory frameworks in order to expand the electrical and electronics sector in Kenya.

#### **4.4.4.3 The Impact of Globalisation and Related Issues on Business**

In addition to the manufacturers' views on the impact of regulations in a liberalised environment, further views from open-ended questions were obtained with regard to the impact of globalisation on the business environment. There were mixed reactions by the different stakeholders. Besides accepting globalisation as a reality, the business community lamented on the unfair trade practices by the more advanced countries, which have resulted in reduction of business incomes. Some of the unfair trade practices included counterfeits and contrabands that were exacerbated by the limited local capacity to enforce policy flexibilities from trade remedy provisions. However, a number of firms also praised globalisation for improving and benchmarking standards, creating new markets and new products to improve customer choices and technology transfer. It also stimulated partnerships across the geographical divide, thus creating opportunities for upgrading technology and skills. Nevertheless, overall, the developing countries were not ready for the vagaries of globalisation.

The public sector held similar views but heightened the need for sensitisation of the business community on the changed global business environment with different architecture. They also acknowledged the positive effects of globalisation in the context of wider consumer choices, new markets and the possibility of participating in



outsourcing. The divergence of views across the public and private sector players gave the indication of the need for intensified sensitisation of the private sector in particular; otherwise they stand to lose out on global opportunities.

These findings are at variance with the theory of enterprise re-organisation and off-shoring of activities across the globe on the basis of competences (Yagahouti, Moradi, & Tajamohammadi's, 2011). The lack of participation in the fragmented production systems resulted in the exportation of counterfeit and contraband products (UNCTAD, 2002:2004 & UNIDO, 2009). Globalisation appears not to have worked for Kenya. There has not been any effective integration of the MNCs/TNCs with SMEs in developing countries.

The implications were that regardless of firm size and location, globalisation has made it possible for SMEs to participate alongside TNCs/MNCs. Kenyan firms appeared to be positively disposed to globalisation. With the right policy environment, they are likely to partner with better-endowed firms for purposes of technology transfer.

#### **4.4.4.4 Correlation Analysis—Regulations on Competitiveness**

The degree of correlation and levels of significance between regulations and competitiveness is presented in Table 4.60. The correlation coefficient between competitiveness and regulations was 0.399 and a p-value of 0.082 for a 2-tail test. This translated into 39.9% of the variations in competitiveness being explained by regulations. However, with the p-value of 0.082 in excess of 0.05, the relationship between regulations and competitiveness was weak and less than significant.

**Table 4.60: Correlations –Competitiveness and Regulations**

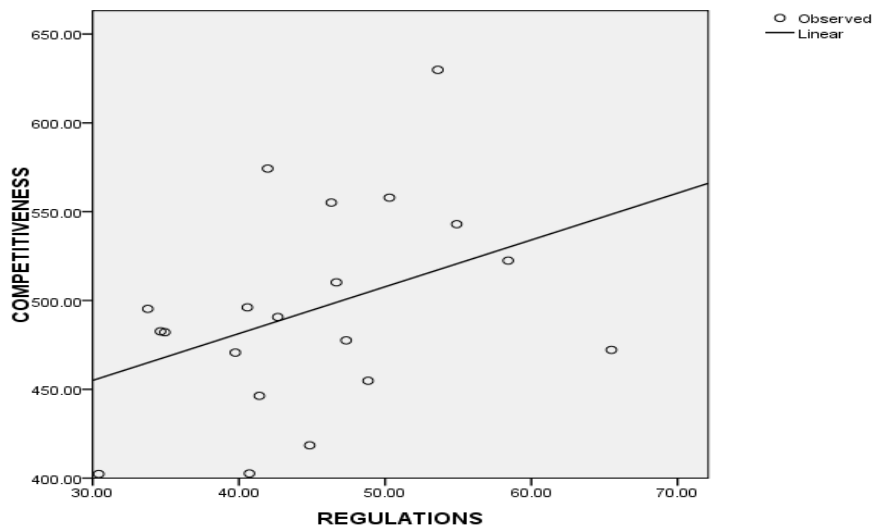
<b>Variable</b>	<b>Coefficient type</b>	<b>Competitiveness</b>	<b>Regulations</b>
<b>Competitiveness</b>	Pearson Correlation	1	.399
	Sig. (2-tailed)		.082
	N	20	20
<b>Regulations</b>	Pearson Correlation	.399	1
	Sig. (2-tailed)	.082	
	N	20	20

These findings corroborated Ongwae’s (2011) study on war against counterfeits, which confirmed that in spite of the existence of the legal and regulatory frameworks on Trademarks, Counterfeits and Piracy, counterfeit products continued to displace genuine products in Kenya. Kenyan manufacturers incurred an annual net loss of over Ksh.30 billion while the government loses money in the tune of Ksh.6 billion in potential tax revenue. Counterfeiting reduces company revenues, stifles investment, innovation, threatens customer safety and security, and retards economic growth (Ongwae, 2011; Mulatu & Withagen, 2003). Using a sample of fifty-three (53) private entrepreneurs, Tan’s (1996) study of Chinese entrepreneurs found that regulatory hostility, dynamism and complexity led to strategies characterised by innovativeness, pro-activeness and risk-taking; yet discouraged future-oriented strategy.

The findings imply that regulations on their own will not solve problems of competitiveness. The regulations should be proactive in promoting future-oriented strategies. There is need to take into account changes in production, marketing and consumer tastes.

#### 4.4.4.5 Regression Analysis—Regulations on Competitiveness

An approximation of a line of fit across the scatter plots in Figure 4.10 shows that the distribution of the scatter plots, though not closely clustered, seem to fall along a line. A straight line can be fitted among these scatter points to suggest that there is a linear relationship between management practices and implementation of strategic plans in the form  $Y = \beta_0 + \beta_1 X_1 + e$ . However, the goodness of fit (Table 4.68) indicates that only 15.9% of the variations in competitiveness are explained by regulations.



**Figure 4.11: Regression Analysis —Competitiveness and Regulations**

Table 4.61 presents the goodness of fit of model  $Y = \beta_0 + \beta_1 X_1 + e$  being the linear model involving regulations ( $X_1$ ) as the only independent variable. The coefficient of determination (R square) of 0.159 indicated that regulations in the model explained only 15.9% of the variation or change in the dependent variable. This depicted a weak relationship, since 84.1% of the variations in electrical and electronics manufacturing were explained by other factors other than regulations.

**Table 4.61: Goodness of Fit Model Summary—Competitiveness and Regulations**

<b>Indicator</b>	<b>Coefficient</b>
R	0.399
R square	0.159
Adjusted R square	0.112
Standard error estimate	54.70376

These results corroborate Muthiani's and Wanjau's (2012) study on the factors influencing the influx of pharmaceutical counterfeits among the SME businesses in Kenya; which established that legislation, popularity of a brand and pricing influenced the importation of counterfeits. Further, the Reagan administration also believed that the lowering of taxes and adoption of lighter regulatory frameworks could enhance the USA's competitiveness and fend off challenges from emerging economies (IEEE, 1993).

The results underscore the need to understand the fundamentals of the operations of the different markets. Sensitisation on risks of counterfeits may not be adequate to discourage customers. Instead, more intense innovations should come up with products that consumers can afford.

#### **4.4.4.6 ANOVA Analysis—Regulations on Competitiveness**

The analysis of variance (ANOVA) in Table 4.62 details out the influence of regulations on competitiveness of the electrical and electronics sector. The regression results with a p-value of 0.082, which is above 0.05, indicated that the model is not statistically significant in explaining the impact of regulations on the electrical and electronics sector's competitiveness in Kenya. Therefore, reject the null hypothesis that regulations have no role in stimulating the competitiveness of the electrical and

electronics sector. Therefore, conclude that regulations have no significant relationship with the competitiveness of the electrical and electronics sector in Kenya.

**Table 4.62: ANOVA Analysis of Regulations on Competitiveness**

<b>Model</b>	<b>Sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
Regression	10174.852	1	10174.852	3.400	.082
Residual	53865.018	18	2992.501		
<b>Total</b>	<b>64039.870</b>	<b>19</b>			

Table 4.63 presents the regression results of regulations on competitiveness of the Kenyan electrical and electronics sector. With a significant constant (p-value=0.000) of 375.976, the study concluded that even without regulations, there seemed to be some level of competitiveness in the electrical and electronics sector in Kenya.

The gradient coefficient indicating the extent to which a unit change in the independent variable causes a change in the dependent variable was positive at 2.635. Thus, a unit change in regulations leads to 2.635 units of positive change in competitiveness of the electrical and electronics sector. However, a gradient p-value of 0.082, which was higher than the p-value of 0.05 indicated that regulations were not significant at 5% level.

The constant of 375.976 corresponds to the Y-intercept. Consequently, the regulations' competitiveness model can now be presented as follows:

$$Y = 375.976 + 2.635X_3$$

The findings corroborate Muthoni's (2011) research on the effects of vandalism on service delivery, in which regulations had to be buttressed by enforcement with deterrent sentences in order to manage vandalism. In addition, the general public needs to be sensitised on communal ownership of the infrastructure that guarantees efficient service delivery. The findings were further corroborated by the study by Muthure, Ofafa and Muathe (2013), which revealed that infrastructure was more critical than regulations in the operations of M-Pesa in Kenya.

The implications of the study findings were that there was need to evaluate the binding factors in each sector rather than making generalisations. In this regard, it would be prudent to carry out further research on what is really keeping away electrical and electronics investors from Kenya.

**Table 4.63: Model Coefficients—Regulations on Competitiveness**

<b>Model</b>	<b>Unstandardized coefficients</b>		<b>Standardised</b>	<b>t</b>	<b>Sig.</b>
	<b>B</b>	<b>Std. Error</b>	<b>coefficients</b> Beta		
(Constant)	375.976	65.291		5.758	.000
Regulations	2.635	1.429	.399	1.844	.082

#### **4.4.5 Effect of Market Access on the Electric and Electronics Sector's**

##### **Competitiveness**

The fourth objective of the study was to establish the effect of market access on Kenya's electrical and electronics sector's competitiveness including linkages to markets. The research in the context of market access set out to explore the level of the electrical and electronics sector's participation in the supply/customer chains relationships at the national, regional and global markets, outsourcing and related supply chain relations with support institutions.

##### **4.4.5.1 Factor Analysis—Market Access**

The market access factor analysis loading results indicated that the weights ranged between 0.089 and 0.895. Apart from trade logistics, the other factors did not meet the minimum factor loading of 0.7 (Henson & Roberts, 2006). Of the 34 items featured in the factor analysis, 11 items had loading results that qualified for further analysis on the basis of the threshold of 0.7 (Henson & Roberts, 2006) (Table 4.64). Open-ended questions sought to establish the level and intensity of supply chains in the electrical and electronics sector in Kenya. This was consistent with the current international market access scenarios in which entry strategies remain the more effective mode of market access in liberalised and globalised business environments.

**Table 4.64: Factor Analysis—Market Access**

Component	Loading
1. Supply/customer chain relationships	
2. Outsourcing	
<b>(a) Cost Reduction</b>	
i. Pressure to reduce costs	0.210*
ii. Reduce work force	0.330*
<b>(b) Productivity Enhancement</b>	
i. To tap into new technology	0.100*
ii. To facilitate cluster arrangement	0.054*
iii. Minimise supplier interruptions	0.465*
<b>(c) Market Access</b>	
i. Pressure to meet customer satisfaction	0.347*
ii. Market expansion	0.352*
<b>Challenges of Outsourcing</b>	
i. Loss of control/power	0.537*
ii. Fall in employee morale	0.322*
iii. Supply interruptions	0.176*
iv. Poor quality of service	0.302*
<b>(d) Trade-facilitating Logistics</b>	
i. Information network with suppliers	0.895
ii. Maintaining a website	0.727
iii. Subscribing to international data bases	0.853
iv. Joint development in different clusters	0.740
v. Information sharing	0.383*
vi. Method of procurement	0.135*
<b>Logistics in the Last 5 Years</b>	
i. Information network with suppliers	0.472*
ii. Maintaining an interactive website	0.727
iii. Subscribing to international data bases	0.849
iv. Joint development of logistics in different clusters	0.805
v. Internet based Information sharing	0.839
vi. Online business transactions	0.622*
<b>Why Undertake Logistics</b>	
i. Information network with suppliers	0.472*
ii. Need to divert resources to core functions	0.206*
<b>Logistics Challenges</b>	
i. Poor internet connectivity (slow, lacking)	0.560*
ii. Impact of differences in time zones	0.561*
iii. Servicing orders timely	0.579*
iv. Information networks to facilitate information sharing with buyers and suppliers	0.673
v. Maintaining an interactive website	0.753
vi. Subscribing to international data bases	0.849
<b>Proposals for Strengthening Business Logistics</b>	
i. Capacity building	0.089*
ii. Government facilitation in identifying external partners and building the logistic networks	0.387*
iii. Maintenance of data bases along the same international requirements	0.197*

\*Items with less than 0.30 factor loadings.



#### **4.4.5.2 Supply/Customer Chain Relationships**

The supply/customer chain relationships in the study were analysed in the context of source and destination markets, location of value in the chain and the type of business partnerships. The analysis concluded with the identification of the key contributors to the supply/customer chain relationships and market access.

##### **(a) Supplier Relationships**

The study evaluated the supplier markets, market relationships and the products and services traded in. Based on the analysis of the key suppliers to the electrical and electronics sector (Table 4.65), the three main suppliers accounted for 91% of the supply costs with supplier one (57%) being the dominant source. While these key suppliers were located in Europe and China, there was very little by way of sourcing from within the EAC (0.7%) and COMESA (1.7%) regions. Supplier three did the least business in Kenya. The Kenyan local sources accounted for 20.1% of the inputs. These results were consistent with an industry dependent on external sourcing of its inputs. As such, trade logistics within Porter's and Haines' value chains should be important for competitiveness. However, the source of supplies was concentrated in very few providers and there was not much by way of competition in the supplier markets.

**Table 4.65: Supplier Chain Relations**

Suppliers	Share of Local supplier costs (Kenya)	EAC	COM-ESA	Europe	China	Asia	Mean score	SD	
	%	%	%	%	%	%	No.	No.	
<b>Supplier 1 (S1)</b>	57	4	0	1	22	29	2	56.92	27.579
<b>Supplier 2 (S2)</b>	22	10.3	0.4	0.6	4.4	5.9	0.4	21.54	16.998
<b>Supplier 3 (S3)</b>	12	5.8	0.3	0.1	2.3	3.3	0.2	11.54	9.658
<b>Total</b>	91	20.1	0.7	1.7	28.7	38.2	2.6		
<b>Average</b>	45.5	10.1	0.4	0.9	14.4	19.1	1.3	<b>30.00</b>	<b>18.078</b>

The main items supplied included materials and components (32.3% for S1, 52.6% for S2 and 41.7% for S3), machinery and equipment and technical appliances (22.6% for S1, 10.5% for S2 and 5.9% for S3) and technical services (12.9%, 15.8% and 11.7% respectively) (Table 4.66). IT services were in demand and sourced from outside the companies. Business support, financial and human resources were the least sought requirements, accounting for between 0% and 5.9%. Overall, the average SDs of less than 0.4 demonstrated the convergence of industry structures across the different manufacturers. Similar products were being manufactured. The results on types of inputs, in accordance with Houghton & Thorborn (2004), designate an industry concentrating in the less-competitive segments of the value chain. The service segments comprising the higher value-added segments of the electrical and electronics products/services in the value chain accounted for less than a quarter of the firms' outputs.

**Table 4.66: Main Items Supplied**

Items/Suppliers	S1			S2			S3		
	%	Mean score	SD	%	Mean score	SD	%	Mean score	SD
(i) Materials & components	32.3	0.77	0.439	52.6	.77	.439	47.1	.62	.506
(ii) Software to be embedded in your products or services	16.1	0.38	0.506	5.3	.08	.277	5.9	.08	.277
(iii) Machinery & equipment used in production	22.6	0.54	0.519	10.5	.15	.376	5.9	.08	.277
(iv) Technical services (e.g. R&D, design, prototyping)	12.9	0.31	0.480	15.8	.23	.439	11.7	.15	.376
(v) IT applications software & services	6.5	0.15	0.376	10.5	.15	.376	11.7	.15	.376
(vi) Business services (e.g. marketing)	3.2	0.08	0.277	0	.00	.000	5.9	.08	.277
(vii) Banking & financial services	3.2	0.08	0.277	0	.08	.277	5.9	.08	.277
(viii) Human resources & recruitment services	3.2	0.08	0.277	5.3	.00	.000	5.9	.08	.277
<b>Average</b>		<b>0.30</b>	<b>0.394</b>		<b>0.18</b>	<b>0.273</b>		<b>0.17</b>	<b>0.330</b>

According to analysis results in Table 4.67, the respective main activities of the participating firms were concentrated in production/manufacturing (28.6%) and wholesale and retail (17.1%) segments of the value chain. These segments are less competitive and consistent with characteristics of less sophisticated industries. Participation in the higher value and more competitive segments of R&D (8.6%), branding and related services (8.6%) were among segments with least business. Trading of intermediates was also limited with only 11.4% sale of materials and components. On the basis of a scale of 1 (Yes) and 2 (No), the mean score of 1.62 was indicative of an industry with no defined location of value in the supply chain. This

indicated that there was no institutionalised relationship in the chain. These results are at variance with the theories that define competitiveness in the fragmented production systems.

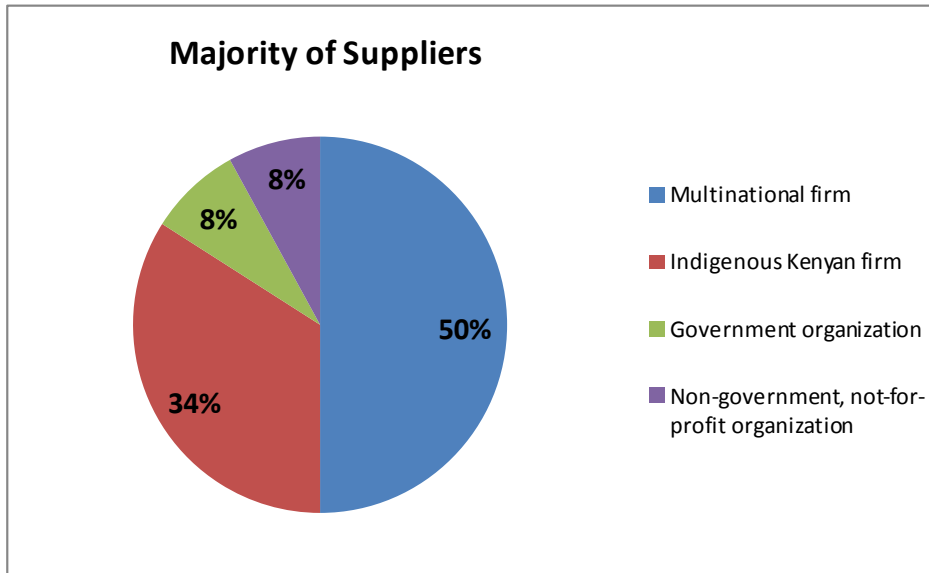
**Table 4.67: Location of Value in the Supply Chain**

<b>Supply chain</b>	<b>%</b>	<b>Mean score</b>	<b>SD</b>
i) Research & development	8.6	1.77	.439
ii) Design	11.4	1.69	.480
iii) Supply of machinery & equipment	14.3	1.62	.506
iv) Supply of materials & components	11.4	1.69	.480
v) Production/manufacturing	28.6	1.23	.439
vi) Branding & marketing	8.6	1.77	.439
vii) Wholesale & retail	17.1	1.54	.519
<b>Total</b>	<b>100.0</b>	<b>1.62</b>	<b>.472</b>

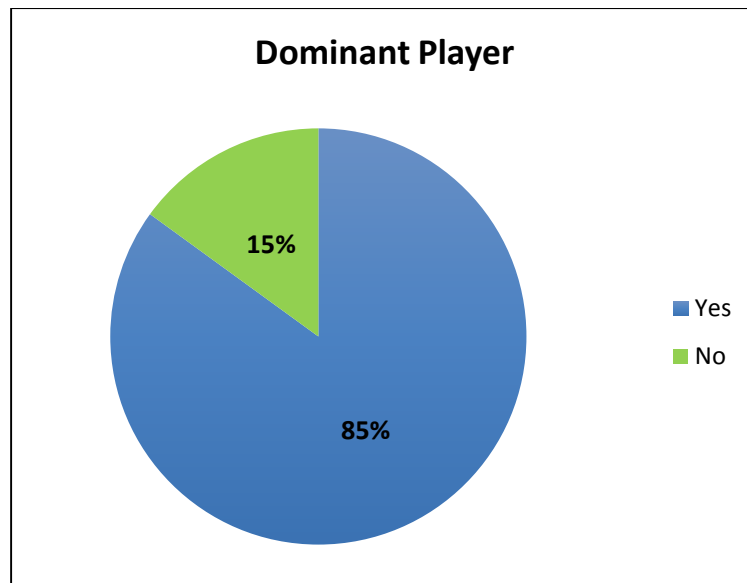
From the results presented in Table 4.68, the majority of the suppliers were multinationals (50%) followed by indigenous Kenyan firms (34%) (Figure 4.12). NGOs and government organisations made the least supplies, each accounting for 8%. The significant location of the value position was in production and manufacturing (28.6%) (Table 4.67). However, 85% of the manufacturers acknowledged the existence of a dominant player in the supply chain (Figure 4.13). On the basis of the Yes (1) and No (2) ranking, as presented in Table 4.68, the relationship of the organisation with the supplier was indeterminate. This meant that the supplier/customer relationships were not anchored on fragmented production systems. The manufacturers, instead, sourced from the most convenient supplier on need basis.

**Table 4.68: Relationships with Type of Supplier**

Type of organisation	%	Mean score	SD
i) Multinational firm	50	1.54	0.519
ii) Indigenous Kenyan firm	34	1.69	0.480
iii) Government organisation	8	1.92	0.277
iv) Non-government, not-for-profit organisation	8	1.92	0.277
Total	100	-	-
<b>Average</b>		<b>1.77</b>	<b>0.388</b>



**Figure 4.12: Majority of Suppliers**



**Figure 4.13: Dominant Player in the Supply Chain**

The findings on the supplier chain relationships in which the firm value location in the value chains is concentrated in production, wholesale and retail are consistent with an industry at the bottom of the technology pyramid (ECA, 1998; GoK, 2007; McCormick & Onjala, 2007; Magu, 2011). The findings are also consistent with an SME-based industry that practices wholesale and retail services (Lall, 2000). It corroborates the actual structure of the Kenyan industry anchored on repairs and maintenance (GoK, 2007).

Based on firm linkages in the value chain, the findings imply that the manufacturers are entrenched in the manufacture of basic electrical and electronics equipment and seemed not ready to be part of the global value chains. This was further consolidated with the indeterminate type of suppliers the manufacturers are linked with. A more competitive partnership would have been determined through direct R&D and branding linkages. The sector needs to restructure in totality in order to remain

competitive. This can be built on existing dominant relationships with the MNCs/TNCs.

### (b) Customer Chain Relationships

The study further explored customer chain characteristics with regard to location, use, marketing channels and interactions with institutions managing compliance with market requirements. The three main customers accounted for 69% of the sales with the local customer C1 (42%) being the largest buyer (Table 4.69). The local market was the main destination of the electrical and electronics sector's manufacturers (69.8%). The next two big buyers came from the EAC region accounting for 9.7% and 2.5% respectively. There were no exports outside the EAC and COMESA regions. The results indicate the lack of competitiveness of the sector outside the local and regional markets. The Gravity Model explains the dominance of the domestic market and exports into the regional markets on the basis of geography. This type of market structure is consistent with production of non-tradable products.

**Table 4.69: Customer Chain Relationships**

Customers	Share of customer	Local (Kenya)	EAC	COM-ESA	Europe	China	Asia	Mean score	SD
	%	%	%	%	%	%	%		
<b>Customer 1 (C1)</b>	42	58.0	0	0	0	0	0	42.18	33.484
<b>Customer 2 (C2)</b>	18	6.9	9.7	1.4	0	0	0	18.02	14.558
<b>Customer 3 (C3)</b>	9	4.9	2.5	1.6	0	0	0	9.41	15.339
<b>Total</b>	69.0	69.8	12.2	3.0					
<b>Average</b>	23	37	4	1	0	0	0	23.20	21.127

On basis of use, the main customers of the electrical and electronics products were end-user firms accounting for the largest buyers (Table 4.70). For example, end-user firms accounted for 47.4% of Customer (C1) sales, 60% for Customer (C2) and 46.2% for Customer (C3). The second-largest categories of customers were households accounting for 21.1%, 15.0% and 23.1% respectively. The third category of customers consisted of government and other public institutions. The results confirmed most firms produced final consumer products. This type of end-use production is not consistent with fragmented production systems that now define competitiveness in the electrical and electronics sector.

**Table 4.70: Relationships with Type of Customer**

Organisation/ customer	C1			C2			C3		
	%	Mean score	SD	%	Mean score	SD	%	Mean score	SD
i) Firms that are end users	47.4	.69	.480	60.0	.92	.277	46.2	.46	.519
ii) Firms that are Original Equipment Manufacturers (OEM)	15.8	.23	.439	10.0	.15	.376	15.4	.15	.376
iii) Government	15.8	.23	.439	10.0	.15	.376	15.4	.15	.376
iv) Other public institutions (e.g. universities)	0	.00	.000	5.0	.08	.277	0	.00	.000
v) End/household consumers	21.1	.31	.480	15.0	.23	.439	23.1	.23	.439
<b>Average</b>	<b>20</b>	<b>0.29</b>	<b>.689</b>	<b>20</b>	<b>.31</b>	<b>.349</b>	<b>20</b>	<b>.20</b>	<b>.342</b>

The type of production and marketing partnerships between the manufacturers and customers were mixed. Joint ventures (40%) were the preferred mode for service delivery while alliances (45.7%) were the dominant partnership (Table 4.71). Networks attracted the least partnerships between manufacturers and customers.



However, on average, all the customers/manufacturers accounted for 14.3% of the arrangements. These findings are consistent with an industry with a short value chain. Whereas the partnerships and networks are practised in the low value-added segments of the electrical and electronics sector manufacture, they nevertheless provide a good basis for stepping up competitiveness. These relationships are consistent with the RBV theories and knowledge management models.

**Table 4.71: Types of Partnerships and Networks**

Activity	Joint venture %	Alliance %	Partnership %	Network %
i) Research	20.0	4.2	4.3	16.7
ii) Product development	6.7	45.7	13.1	0
iii) Manufacturing	6.7	29.2	13.1	16.7
iv) Service delivery	40.0	4.2	47.8	8.3
v) Marketing & sales	6.7	8.3	8.7	16.7
vi) Delivery & order fulfilment	6.7	4.2	8.7	25
vii) After-sales service & support	13.2	4.2	4.3	16.7
<b>Average</b>	<b>14.3</b>	<b>14.3</b>	<b>14.3</b>	<b>14.3</b>

The manufacturers' interactions with the standards and compliance institutions were evenly spread out across all the regulatory institutions, ranging between 11% and 16.5% (Table 4.72). The mean score of close to one in all arrangements was consistent with affirmative relationships on a Yes (1) and No (2) scale. This augurs well for an industry that demands very high product and service quality. Both Haines and Porter's value chain theories form the anchor for the type of relationship depicted in the analysis.

**Table 4.72: Manufacturers' Interactions with Regulatory Institutions**

<b>Standards and compliance</b>	<b>%</b>	<b>Mean score</b>	<b>SD</b>
i) Kenyan standards organisations	15.1	1.15	.376
ii) Overseas standards organisations	15.1	1.23	.439
iii) Environmental protection	12.3	1.31	.480
iv) OH&S	11.0	1.38	.506
v) Testing & conformance	16.5	1.08	.277
vi) Business regulation	13.7	1.23	.439
vii) Quality control & accreditation	16.5	1.08	.277
<b>Average</b>		<b>1.21</b>	<b>0.399</b>

However, support and development interactions were varied across the electrical and electronics manufacturing enterprises. The highest interactions were with international business networks (76.9%) while interactions with those in government were recorded at 38.5% (Table 4.73). Substantial interactions were also recorded with R&D institutions (69.2%), industry groups (61.5%) and education and training institutions (46.2%). The mean scores of R&D (1.31), international business networks (1.23) and industry groups (1.38) suggested strong relationships while those of government (1.62) and education and training (1.54) was an indicator of an industry left to fend for itself. The low level of interactions between manufacturers and government-support institutions is consistent with an industry with low export performance. The demand for export certification is limited.

**Table 4.73: Manufacturers' Interactions with Support Institutions**

<b>Support institutions</b>	<b>%</b>	<b>Mean score</b>	<b>SD</b>
i) Education & training	46.2	1.54	.519
ii) R&D	69.2	1.31	.480
iii) International business networks	76.9	1.23	.439
iv) Industry groups	61.5	1.38	.506
v) Government programmes	38.5	1.62	.506
vi) Other	15.4	1.85	.376
<b>Average</b>		<b>1.49</b>	<b>.471</b>

The findings from supplier/customer chain relationships, location of value and type of networks were inconsistent with fragmented production systems typical of electrical and electronics sectors' competitiveness (Yagahouti, Moradi & Tajamohammadi, 2011). The results were also inconsistent with competitiveness principles as portrayed by Porter's (1985; 1990) Five Forces and value chains. Neither were the trading systems in place consistent with GVCs in which there is dominance of internationally-operating buyers and retailers (UNIDO, 2009). Instead, buyers were predominantly local with very little trade in the regional markets and nothing into the export markets.

The results imply that the Kenyan electrical and electronics sector remains underdeveloped operating from the bottom of the value chain. Unless and until the electrical and electronics sector integrates into the GVCs, there is the likelihood of the industry closing down in the near future. Left on its own, the industry will not restructure. The government has to step in and provide direction. In particular, the strategy should build on strategic partnerships with international players.

### **(c) Key Contributors to Market Access**

The study also explored the main contributors to market access. The public and private sector facilitators rated highly (mean score 5) information access and networking as the key transmission mechanisms to market access (Table 4.74). Equally important were the various agreements (mean score 4.86), product quality (mean score 4.71) and a strong private sector (mean score 4.57); all of which had a mean score in excess of 4.5. Support institutions (mean score 4.43) and public-private partnerships (mean score 4.29), though important, displayed wider variation from the

SDs; in excess of 0.5. The results indicated convergence of mind in the factors that influence market access for electrical and electronics products.

These findings corroborate the performance of different regional economic groupings in which trade flourished with the establishment of trade agreements and complemented with efficient infrastructure. According to WTO, regional agreements now account for 50-60% of global trade (WTO, 2012). Nevertheless, intra-EAC trade stands at about 10% while that of COMESA is less. This implies that trade potentials remain underutilised. Kenya's trade has diversified to include manufactures with the establishment of the EAC and COMESA regional trade agreements. Currently, these markets account for more than 50% of Kenya's exports (EAC, 2010).

The facilitators are likely to strengthen information disclosure, networks and participation in international databases. More importantly will be the need to participate fully during negotiations of regional and international agreements. The private sector partnerships with government should prioritise formulation of conducive business environment in order to attract investment.

**Table 4.74: Main Contributors to Market Access**

Contributors to market access	Mean score No.	SD No.
i) Information access and network	5.00	0.000
ii) Operational, bilateral, regional and international agreements	4.86	0.378
iii) Quality products	4.71	0.488
iv) Support institutions	4.43	0.535
v) Strong private sector	4.57	0.535
vi) Effective public-private sector partnerships	4.9	0.756
<b>Average</b>	<b>4.74</b>	<b>.449</b>

#### **4.4.5.3 Outsourcing**

The study obtained views from the stakeholders on what prompted them to outsource part of their activities. The review was done on the basis of when outsourcing as a management tool started, justifications for outsourcing and challenges so far encountered. In this regard, outsourcing was investigated as a form of modern business management that consisted of subcontracting non-core or much specialised functions to free resources reduce overheads or operational costs or transfer risks.

##### **(a) Start of Outsourcing**

The findings in Table 4.75 indicated that outsourcing in both public and private sectors took effect in earnest after 2000. The largest (69.2%) contingent of manufacturing firms started outsourcing between 2000 and 2005. A small proportion (14.3%) of the facilitators had tried out outsourcing before 2000, with a larger group (57.1%) starting outsourcing between 2006 and 2010. The outsourcing arrangements corresponded very closely with the overall liberalisation and privatisation of the Kenyan economy. The implications are that outsourcing works efficiently in a liberalised environment. Findings on outsourcing are consistent with Haines and Porter's value chain theories. The outsourcing arrangements are aligned to OLI fragmented production systems. However, the bulk of the outsourced activities are non-core, thus the fragmented production systems had not taken root.

**Table 4.75: Year Outsourcing was initiated**

<b>Year</b>	<b>Manufacturers</b>		<b>Facilitators</b>	
	<b>No</b>	<b>%</b>	<b>No.</b>	<b>%</b>
<b>Before 2000</b>	0	0	1	14.3
<b>2000-2005</b>	9	69.2	2	28.6
<b>2006-2010</b>	4	30.8	4	57.1
<b>Total</b>	<b>13</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>

#### 4.4.5.4 Trade-facilitating Logistics

Trade-facilitating logistics were reviewed in the context of institutionalisation, role and complementarity with regard to competitiveness and logistical changes in the last five years.

##### (a) Institutionalised Logistics

In the context of globalisation and fragmented production processes, trade logistics underpin management and business operations of both public and private sectors. Towards this end, the study explored the existence of trade logistics at firm level and whether the same constituted part of the strategic management of firm operations (Table 4.75 and 4.76). This was anchored on Yes (1) and No (2) responses. On average, close to 90% (mean score of 1.103) of the manufacturing firms had institutionalised logistics systems; covering interactions with suppliers and buyers (92.3%), institutionalised logistics department (84.6% and mean score of 1.15) and outsourcing mechanisms (92.3% and mean score of 1.08). The manufacturers' responses were aligned to both Porter's and Haines value chain theories. Though well networked, the practice on the ground was indicative of a vertically-integrated industry.

**Table 4.76: Manufacturers' Institutionalised Logistics Arrangements**

Does your firm have the following?	Agree	Mean score	SD
	%	No.	No.
Integrated logistics with suppliers/buyers	92.3	1.08	.277
Logistics department	84.6	1.15	.376
Outsourcing	92.3	1.08	.277
<b>Average</b>	<b>89.73</b>	<b>1.103</b>	<b>0.31</b>

On the basis of the average of 66.7% (mean score 1.29) institutionalised logistics, the facilitators were equally networked (Table 4.77). However, outsourcing (mean score 1.71) seemed not to have taken root. This was indicative of minimum automated support frameworks from both policy makers and related facilitators.

**Table 4.77: Facilitators' Institutionalised Logistics Arrangements**

Does your firm have the following?	Agree	Mean score	SD
	%	No.	No.
Integrated logistics with suppliers/buyers	71.4	1.29	0.488
Logistics department	28.6	1.00	0.000
Outsourcing	100.0	1.71	0.488
<b>Average</b>	<b>66.7</b>	<b>1.33</b>	<b>0.325</b>

The findings from trade logistics in respect of institutionalised systems corroborate those by Humphrey (2000:2002), Gibbon (2005) and Gereffi (1994), which demonstrated the role of logistics in linking buyer and seller-anchored GVCs. In these cases, information logistics enhance management competences to coordinate production and distribution (Sappasert, 2006; Levy, 2007 & Walley, 2010).

The findings also imply that the Kenyan business community appreciates the role of trade logistics in business management. They are also ready to work jointly with government in capacity building and establishing strategic partnerships to leverage external competences and new markets. Both the public and private sectors are keen to invest in ICT infrastructure and support services in order to step up competitiveness.

**(b) The Role of Logistics**

The main role of logistics in management is multifaceted. The manufacturers, in particular, used logistics for networking with suppliers (84.6%) (Table4.78). This was achieved through subscribing to international databases (84.6%) and maintaining websites (77%). The logistics also assisted in procurement (69.3%) and information sharing (77%). Despite the mean scores of close to 4, the SDs in excess of 1 demonstrates divergence of views among the manufacturers. Thus, the role of logistics in the management of the electrical and electronics sector was not that critical. This gave the impression that the sector may not be ready for outsourcing.



**Table 4.78: Manufacturers' Views on the Main Role of Logistics in Management**

<b>Role of logistics in management</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean Score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
i) Information network with suppliers	23.1	61.5	7.7	0	7.7	3.92	1.038
ii) Maintaining a website	38.5	38.5	7.7	7.7	7.7	3.92	1.256
iii) Subscribing to international databases	23.1	61.5	7.7	0	7.7	3.92	1.038
iv) Joint development in different clusters	15.4	46.2	30.8	0	7.7	3.62	1.044
v) Information sharing	30.8	46.2	23.1	0	0	4.08	.760
vi) Method of procurement	23.1	46.2	15.4	15.4	0	3.77	1.013
<b>Average</b>	<b>25.7</b>	<b>50.0</b>	<b>15.3</b>	<b>3.9</b>	<b>5.1</b>	<b>3.87</b>	<b>1.025</b>

On the other hand, there was a stronger concurrence among the facilitators on the role of logistics in management as demonstrated through the mean score in excess of 4 and SDs less than 1 (Table 4.79). The facilitators were in full agreement with all the attributes reviewed in the role of logistics in management. These results provided the confirmation that logistics were an integral part of management.

The findings from trade logistics in respect of institutionalised systems corroborate previous studies in which information logistics have enhanced management competences by integrating information into coordination, distribution and competitive intelligence monitoring (Sappasert, 2006; Levy, 2007 and Walley, 2010). Similar experiences were reported with regard to investment in ICT logistics, which created diversified economic activities in Kenya (Jack and Suri, 2010). The Nigerian experience on the adoption of the internet and online services facilitated the provision of timely information on a wider set of markets.

The findings also imply that the Kenyan business community appreciates the role of trade logistics. They are also ready to work jointly with the government in capacity building and establishing strategic partnerships to leverage external competences and new markets. Both the public and private sectors are keen to invest in ICT infrastructure and support services in order to step up competitiveness.

**Table 4.79: Facilitators' Views on the Main Role of Logistics in Management**

Role of logistics in management	Strongly agree	Agree	Neutral	Disagree	Strongest disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Information network with suppliers	57.1	42.9	0	0	0	4.57	0.535
ii) Maintaining website	71.4	28.6	0	0	0	4.71	0.488
iii) Subscribing to international databases	71.4	28.6	0	0	0	4.71	0.488
iv) Joint development in different clusters	71.4	28.6	0	0	0	4.71	0.488
v) Information sharing	42.9	57.1	0	0	0	4.57	0.535
vi) Method of procurement	57.1	42.9	0	0	0	4.57	0.535
<b>Average</b>	<b>61.9</b>	<b>38.1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4.64</b>	<b>0.512</b>

### (c) Complementarity of Trade Logistics

#### (i) Standardisation

There was general agreement of over 60% (15.4% and 46.2%), as presented in Table 4.80, on the role of standardisation of rules and procedures in increasing meaningful competition. The mean score of 3.62 and SD of 0.961 confirmed the borderline views of indifference and agreement on the role of standards in aiding competition. The standardisation of processes was benchmarked to international best practice as well as rated highly by the manufacturers with close to 70% (30.8% and 38.5%) in

agreement and with a mean score of 4.00. The standardisation of processes was well received by the manufacturers with a mean score of 4.00 and SD of 0.816.

**Table 4.80: Manufacturers’ Views on the Impact of Trade Facilitation Regulations on Business Performance**

Impact of trade facilitation regulations on business performance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Standardisation of rules and procedures (laws) has improved competition	15.4	46.2	23.1	15.4	0	3.62	0.961
ii) Standardisation processes benchmarked to international best practice provide motivation to investors	30.8	38.5	30.8	0	0	4.00	0.816
<b>Average</b>	<b>23.1</b>	<b>42.3</b>	<b>26.9</b>	<b>7.7</b>	<b>0</b>	<b>3.81</b>	<b>0.889</b>

However, the agreement among the facilitators was more categorical, as presented in Table 4.81, with 85.7% in agreement on standardisation of rules and procedures. This was validated with a mean score of 4.43 and SD of 0.787. Further, all the facilitators were in agreement on benchmarking standardised processes to international best practice. These findings gave the indication of the commitments of the stakeholders in enforcing trade facilitation requirements.

**Table 4.81: Facilitators' Views on the Impact of Trade Facilitation Regulations on Business Performance**

Impact of trade facilitation regulations on business performance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Standardisation of rules and procedures (laws) has improved competition	57.1	28.6	14.3	0	0	4.43	0.787
ii) Standardisation processes benchmarked to international best practice provide motivation to investors	57.1	42.9	0	0	0	4.57	0.535
<b>Average</b>	<b>57.1</b>	<b>35.8</b>	<b>7.2</b>	<b>0</b>	<b>0</b>	<b>4.5</b>	<b>0.661</b>

These findings corroborated the various trade regulations anchored on multilateral commitments but necessary for the functioning of competitive markets. These include the Standards Act (Cap 472), Plant Health Protection (Cap 324), regulating trade in live plants and animal health standards (HACCP ISO 9001 and 14001). The OECD (2000) trade report explained the role of regulations in the expansion of Chinese FDIs, which subsequently expanded production frontiers with resultant competitiveness.

The liberalised markets had exposed local producers to international competition from cheaper imports. However, the business community was well disposed to standard market requirements and regulations with a strong willingness for their enforcement. Compliance with production requirements in outsourced production processes should not pose much stress to the electrical and electronics sector once firms take the bold decision to modernise their production processes.

*(ii) Trade Remedies (Anti-Corruption and Anti-Dumping)*

The Kenyan electrical and electronics sector responses in Table 4.82 reflected limited utilisation of trade remedy instruments. Only 30.8% of the manufacturers were in agreement that anti-corruption and anti-dumping laws were working and having an impact at firm level in Kenya. The other 7.7% disagreed and 61.5% were neutral. The low mean score of 2.85 and SD of 1.068 on the workings of anti-corruption laws and mean score of 3.08 on anti-dumping regulations all point to the lack of confidence in the functioning of the trade remedy legislations in Kenya. The findings reflected that trade remedies, though providing policy flexibility to support businesses in a market economy, have limited application in Kenya.

**Table 4.82: Manufacturers’ Views on the Impact of Trade Remedies on Business Performance**

(b) Trade remedies	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	%	%
i) Anti-corruption laws are working	7.7	23.1	61.5	7.7	0	2.85	1.068
ii) Anti-dumping laws have an impact at firm level	7.7	23.1	61.5	7.7	0	3.38	0.751
<b>Average</b>	<b>7.1</b>	<b>23.1</b>	<b>61.5</b>	<b>7.7</b>	<b>0</b>	<b>3.12</b>	<b>0.910</b>

The findings from the facilitators had a similar pattern (Table 4.83). Only 14.2% of the facilitators agreed that anti-corruption laws were working. Of the remainder, 42.9% were neutral while a similar proportion of 42.8% disagreed. Though 42.8% of the facilitators strongly agreed that anti-dumping laws had an impact at firm level, 28.6% were indifferent and another 28.6% disagreed. This was a reflection of an industry where trade remedies do not work as expected.

**Table 4.83: Facilitators' Views on the Impact of Trade Remedies on Business Performance**

(b) Trade remedies	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	%	%
i) Anti-corruption laws are working	14.2	0	42.9	42.9	0	2.86	1.069
ii) Anti-dumping laws have impact at firm level	42.8	0	28.6	28.6	0	3.57	1.397
<b>Average</b>	<b>23.8</b>	<b>9.5</b>	<b>33.4</b>	<b>33.4</b>	<b>0</b>	<b>3.24</b>	<b>1.193</b>

All these findings were inconsistent with Henisz's (2002) and Waheeduzzaman's (2011) assertions that direct government interventions in managing the business environment and use of factors of production influence the level of sector competitiveness. The OECD (2000) report acknowledged the role of government in China's ability to attract FDIs. Spulber (2007), on the other hand, highlights the role of strategic interventions taking into account local and foreign competitors' conditions in order to leverage customers' preferences.

The lack of confidence in the working of the trade remedy legislations can be explained by the stiff and unfair competition Kenya had experienced from subsidised, contraband and counterfeit goods even after the adoption of requisite legislations. Besides sensitisation against cheap contraband and counterfeit products, the manufacturers had to price their products more competitively in order to attract customers. In this regard, the government has to redouble its efforts in the enforcement of the current legislations while paying special attention to destination markets.

#### (d) Changes in Management Logistics

In recognition of the strategic role of logistics in business management, the study tracked logistic changes in the last five years. Both manufacturers and facilitators reported a number of changes in their logistics arrangements. The manufacturers, in particular, strengthened information networks with suppliers (100%) and internet-based information sharing (69.2%) (Table 4.84). This necessitated more elaborate websites (69.3%) and stronger linkages with international databases (61.5%). Online business transactions (61.6) appear to have picked up momentum among the manufacturers in the last five years. The manufacturers maintained mean scores of less than 4, giving a stronger indication of an industry where logistics was not a strong element in management and operations.

**Table 4.84: Manufacturers' Logistics Changes in the Last 5 Years**

Changes in logistics in last 5 years		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD	
		%	%	%	%	%	No.	No.	
i)	Maintaining website	a	30.8	38.5	23.1	7.7	0	3.85	1.144
ii)	Subscribing to international databases		7.7	53.8	38.5	0	0	3.69	.630
iii)	Joint development of logistics in different clusters		15.4	23.1	53.8	0	7.7	3.38	1.044
iv)	Internet-based information sharing		7.7	61.5	23.1	0	7.7	3.62	.961
<b>Average</b>			<b>15.4</b>	<b>44.2</b>	<b>34.6</b>	<b>1.9</b>	<b>3.9</b>	<b>3.64</b>	<b>0.945</b>

Apart from the online transactions, the facilitators seemed to have positively embraced logistics judging from the mean scores in excess of 4 in logistical changes to those that had made logistical changes in the last five years (Table 4.85). All facilitators

made changes in information networks with suppliers and maintaining their websites. During the last five years, the majority of 71.5% of the facilitators had subscribed to international databases, participated in joint logistics developments in the relevant clusters and in internet information sharing. This was an indication of migrating support to online support services.

**Table 4.85: Facilitators’ Logistics Changes in the Last 5 Years**

Changes in logistics in last 5 years	Strongly agree %	Agree %	Neutral %	Disagree %	Strongly disagree %	Mean score	SD
						No.	No.
(i) Maintaining a website	57.1	42.9	0	0	0	4.57	.535
(ii) Subscribing to international databases	42.9	28.6	28.6	0	0	4.14	.900
(iii) Joint development of logistics in different clusters	42.9	28.6	28.6	0	0	4.14	.900
(iv) Internet-based information sharing	42.9	28.6	28.6	0	0	4.14	.900
<b>Average</b>	<b>47.6</b>	<b>26.2</b>	<b>23.8</b>	<b>2.4</b>	<b>0</b>	<b>4.19</b>	<b>0.810</b>

In the process of adopting the new logistics arrangements, a number of challenges were encountered (Table 4.86). Maintaining an interactive website (69.2%, mean score of 3.62) followed by the impact of differences in time zones (61.5%, mean score 3.62) were ranked highest among the challenges encountered by the manufacturers. The other challenges revolved around sustaining annual subscriptions to international databases (53.9%, mean score 3.54) and poor internet connectivity (53.9%, mean score 3.85). There was some level of comfort among the manufacturers on



information sharing and timely servicing of orders, which reported the least challenges.

**Table 4.86: Manufacturers' Logistics Challenges**

Logistics challenges	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
(i) Information networks to facilitate information sharing with buyers and suppliers	7.7	38.5	53.8	0	0	3.54	.660
(ii) Maintaining an interactive website	15.4	53.8	15.4	7.7	7.7	3.62	1.121
(iii) Subscribing to international databases	15.4	38.5	38.5	0	7.7	3.54	1.050
<b>Average</b>	<b>12.8</b>	<b>43.6</b>	<b>35.9</b>	<b>2.7</b>	<b>5.1</b>	<b>3.57</b>	<b>0.944</b>

The facilitators, on the basis of the majority of the mean scores in excess of 4, on the other hand, had challenges with the cost of maintaining subscriptions for connectivity to international databases and local internet connectivity limiting options for information sharing (Table 4.87). The facilitators were indifferent on matters of servicing orders as well as challenges of different time zones on the basis of the mean score of 3.43 and 3.29 respectively. However, 85.8% agreed that they had challenges with internet connectivity and 57.2% with information networks. This gave the indication that cost and internet connectivity remained the main inhibitors of automated logistics.

**Table 4.87: Facilitators' Logistics Challenges**

Logistics challenges	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score	SD
	%	%	%	%	%	No.	No.
i) Impact of differences in time zones	28.6	14.3	14.3	42.9	0	3.29	1.380
ii) Servicing orders timely	28.6	14.3	28.6	28.6	0	3.43	1.272
iii) Information networks to facilitate information sharing with buyers and suppliers	42.9	14.3	42.9	0	0	4.00	1.000
iv) Maintaining an interactive website	28.6	28.6	42.9	0	0	3.86	0.900
<b>Average</b>	<b>32.2</b>	<b>17.9</b>	<b>32.2</b>	<b>17.9</b>	<b>0</b>	<b>3.65</b>	<b>1.138</b>

To remedy the challenges in logistics, manufacturers made a number of proposals for strengthening the systems. Proposals on capacity building and maintaining databases benchmarked to international standards did not meet the minimum factor analysis threshold of 0.30 and as such were left out of the analysis. However, 76.9% with a mean score of 3.85 of the manufacturers concurred that strengthening business logistics aided government facilitation in identifying international partners (Table 4.88). The remaining 23.1% were neutral.

**Table 4.88: Manufacturers' Proposals for Strengthening Business Logistics**

<b>Proposals for strengthening business logistics</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean score</b>	<b>SD</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>No.</b>	<b>No.</b>
i) Manufacturers' proposals to government facilitation in identifying external partners and building logistic networks	7.7	69.2	23.1	0	0	3.85	0.555
ii) Facilitators' proposals to government facilitation in identifying external partners and building logistic networks	42.9	57.1	0	0	0	4.43	0.535
<b>Average</b>	<b>25.3</b>	<b>63.2</b>	<b>11.6</b>	<b>0</b>	<b>0</b>	<b>4.14</b>	<b>0.545</b>

Similarly, the facilitators also subscribed to total concurrence on the government leadership role in providing a business environment conducive for strategic partnerships with international players (Table 4.88). This was evident from the mean score of 4.43. The results consolidated the urgent need for strengthening of business logistics in order to address the issue of competitiveness in a globalising business environment.

The findings from trade logistics in respect of institutionalised systems corroborate previous studies in which information logistics have enhanced management competences by integrating information into coordination, distribution and competitive intelligence monitoring (Sapprasert, 2006; Levy, 2007; Walley, 2010). Similar experiences were reported with regard to investment in ICT logistics, which created diversified economic activities in Kenya (Jack & Suri, 2010). The Nigerian

experience on the adoption of the internet and online services facilitated the provision of timely information on a wider set of markets.

The findings also imply that the Kenyan business community appreciates the role of trade logistics. They are also ready to work jointly with the government in capacity building and establishing strategic partnerships to leverage external competences and new markets. Both the public and private sectors are keen to invest in ICT infrastructure and support services in order to step up competitiveness.

#### **4.4.5.5 Correlation Analysis—Market Access on Competitiveness**

The degree of correlation and levels of significance between market access and competitiveness confirmed the positive relationship as presented in Table 4.89. The findings indicated that the correlation coefficient of market access on competitiveness was 0.581 with a p-value of 0.007 for a 2-tail test. This depicts a strong positive and significant relationship between market access and competitiveness.

These findings were in contrast with those by Johansson and Frida (2006) in their report of the Chinese Demand Function of Export of Electrical Machinery Equipment, which established that relative prices had a stronger impact on demand in importing countries. Further, Wignaraja's (2008) study of the export performance of the textile industry profiled foreign ownership as one of the factors critical in market access.

The implications of these findings were that diverse factors have a direct bearing on market access. No one factor can be isolated and addressed singularly for improvement of market access. Combinations of factors have to be reviewed and reformed for the purpose of enhancing competitiveness and market access.

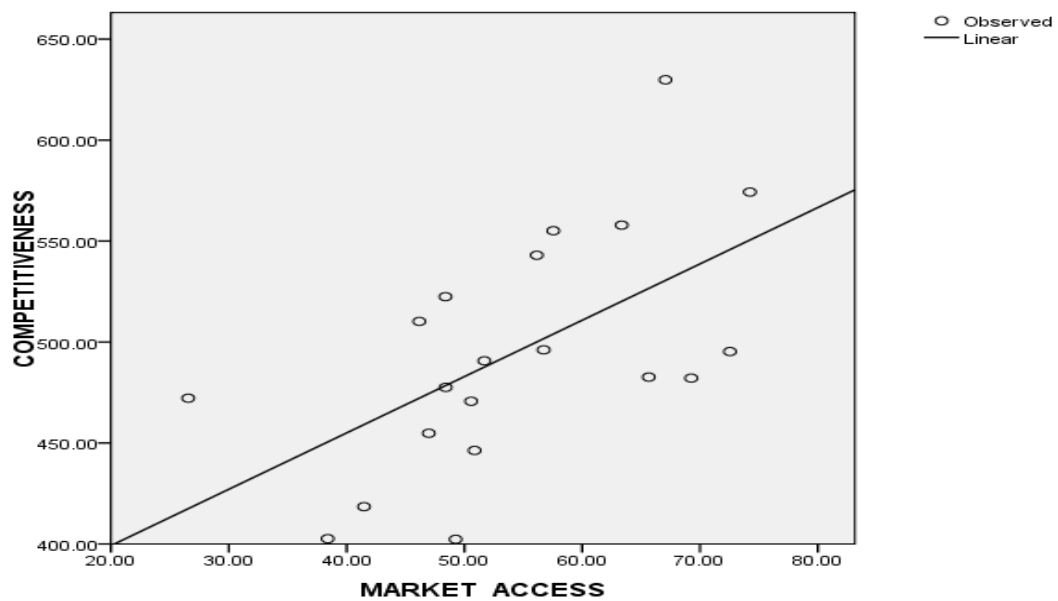
**Table 4.89: Correlation Analysis—Market Access on Competitiveness**

Variable	Coefficient type	Competitiveness	Market access
Competitiveness	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	20	
Market Access	Pearson Correlation	.581	1
	Sig. (2-tailed)	.007	
	N		20

**4.4.5.6 Regression Analysis—Market Access on Competitiveness**

Figure 4.13 shows the distribution of the scatter plot market access on competitiveness. The line of best fit along the scatter plot in Figure 4.14 passes through the origin. There is no skewness to either side indicating that there is a constant variance. Therefore, the straight line suggested that there was a linear relationship between market access and competitiveness in the form:

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



**Figure 4.14: Regression Analysis—Competitiveness and Market Access**

The goodness of fit model in the form  $Y = \beta_0 + \beta_1 X_1 + e$  presented in Table 4.90 involves market access ( $X_1$ ) as the only independent variable. The coefficient of determination (R square) of 0.338 indicated that the model explained only 33.8% of the variation or change in the dependent variable, with the remainder of 66.2% being explained by other factors other than market access. Adjustment of the R square did not change the results substantially, having reduced the explanatory behaviour of the predictor to 30.1%.

The findings corroborated those of Tomohiko, Matsuura and Poncet (2008), which highlighted the economic importance of information sharing and network effects, in both home and export markets. However, the less productive and smaller firms appeared to be more sensitive to distance-related costs and low institutional quality (Tomohiko, Matsuura & Poncet, 2008). Strategic assets-seeking FDI Japanese firms according to Pradhan and Singh (2008) confirmed that firms from developed countries had a stronger affinity to invest outside their host countries in search of resources and markets. In addition, Huang (2012) found out that patenting was, in part, driven by the need to access markets, respond to imitative threats and compete in product markets.

The implications of these findings are that apart from the traditional production cost-based factors, there were a number of other factors impacting on firm locations. As such, firm-level decisions may take many other issues into consideration.

**Table 4.90: Goodness of Fit Model Summary—Competitiveness and Market Access**

<b>Indicator</b>	<b>Coefficient</b>
R	0.581
R square	0.338
Adjusted R square	0.301
Standard error estimate	48.53322

#### **4.4.5.7 ANOVA Analysis—Market Access on Competitiveness**

The analysis of variance (ANOVA) of the influence of market access on competitiveness of the electrical and electronics sector is presented in Table 4.91. The results, with a p-value of 0.007 being less than 0.05, indicate that the model is statistically significant in explaining the impact of market access on the electrical and electronics sector's competitiveness in Kenya. In this regard, reject the null hypothesis that market access has no effect on the competitiveness of the electrical and electronics sector in Kenya. Therefore, it can be concluded that market access has a significant positive relationship with the competitiveness of the electrical and electronics sector in Kenya.

**Table 4.91: ANOVA Analysis—Market Access on Competitiveness**

<b>Model</b>	<b>Sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
Regression	21641.348	1	21641.348	9.188	.007
Residual	42398.522	18	2355.473		
Total	64039.870	19			

Table 4.92 presents the regression results of market access on the electrical and electronics sector's competitiveness in Kenya. With a significant constant (p-value=0.000) of 343.402, the study concluded that even without market access considerations, the sector seemed to display some form of competitiveness.

The gradient coefficient of 2.790 indicated the extent to which a unit change in the independent variable causes a change in the dependent variable; that is the change in competitiveness due to a unit change in market access. In this case, a unit change in market access leads to 2.790 units of positive change in competitiveness of the electrical and electronics sector. This means that market access was significant (p-value=0.007) in positively influencing the competitiveness of the electrical and electronics sector in Kenya.

With a constant of 343.402, the market access competitiveness model can now be presented as follows:

$$Y = 343.402 + 2.790X_4$$

The findings were corroborated by Macharia's (2004) study on the underlying market access factors of the adoption of e-commerce by Kenyan SMEs. In addition, the Free Trade Agreement's (FTAs') expanding market access necessitated scaling up of SME activities to take advantage of the new opportunities (Danaa and Etemada, 2013). Others have gained market access through product branding (Pangarkar, 2004).



The implication of the findings is that firms are required to choose their niche products and markets in order to sustain competitiveness. However, because the majority of the Kenyan firms are SMEs, there will be a tendency to cluster around a niche product. This, in the long run, might require government coordination.

**Table 4.92: Coefficients—Competitiveness and Market Access**

<b>Model</b>	<b>Unstandardized coefficients</b>		<b>Standardised coefficients</b>	<b>t</b>	<b>Sig.</b>
	<b>B</b>	<b>Std. error</b>	<b>Beta</b>		
(Constant)	343.402	50.932		6.742	.000
Market access	2.790	.920	.581	3.031	.007

#### **4.4.6 Moderating Effect of the Operational Environment on the Electrical and Electronics Sector's Competitiveness**

The fifth objective of the study was to establish the role of the operational environment as a moderating factor in the competitiveness of Kenya's electrical and electronics sector. The analysis of the significance tests of the overall regression model was carried out in two stages, that is, with and without the moderating variable. This was to establish the effect of the moderating variable—operational environment—on the independent variables' contributions to the competitiveness of Kenya's electrical and electronics sector. The findings are presented below.

##### **4.4.6.1 Regression Analysis of the Overall Model without the Moderating Variable**

The regression analysis of the overall model without the moderating variable determined the significance of the influence of the independent variables on the Kenyan electrical and electronics sector's competitiveness in absence of the operational environment. The linear regression analysis presented in Table 4.93 indicated that the regression coefficients were significant in explaining the relationship between each of the four independent variables. It also confirmed the significant roles of the four variables in the competitiveness of the electrical and electronics sector in Kenya. All variables recorded p-values of 0.000, which was less than the 0.05 level. The regression coefficients are positive for each of the independent variables and, as such, in concurrence with the hypothesis that each individually positively influences competitiveness.

The interpretation of these results was that the contributions of all variables collectively were positive. For example, a unit change in technology would lead to a positive change in competitiveness by the rate of 3.26. Similarly, a unit change in innovation would lead to change in competitiveness by a rate of 3.433 units. In the case of market access, a unit change would lead to a change in competitiveness by a rate of 4.117 units. A unit change in regulations would lead to a change in competitiveness by a rate of 4.100 units. The results indicate that there was a positive relationship between the independent and the dependent variables. The model can be represented as follows:

$$Y = 3.267X_1 + 3.433X_2 + 4.100X_3 + 4.117X_4$$

Where  $X_1$  = Technology

$X_2$  = Innovation

$X_3$  = Regulations

$X_4$  = Market access

The study further explored the existence of multicollinearity. The Variance Inflation Factor (VIF), which measures the impact of multicollinearity among the variables in a regression model, is also presented in Table 4.93. While VIFs of unity are an indication of no multicollinearity, as a rule of thumb, VIFs between 5 and 10 are an indication of problematic multicollinearity of the independent variables. VIFs in excess of 10 often might indicate poorly estimated coefficients (Myers, 1990; Bowerman and O'Connell, 1990). The independent variables' VIFs presented in Table 4.93 are all in excess of 10; an indication of poor estimation of variable coefficients.

Nevertheless, other scholars have argued that factors other than multicollinearity could be contributory to multicollinearity. Robinson & Schumacker (2009) and Schumacker & Marcoulides (1998), on the other hand, demonstrated that high VIFs in excess of 20 from a linear analysis can be reduced to less than 10 with the centring of the data observations (subtracting mean from each score) and analysing multicollinear effects of multiple interactions in the independent variables. Centring reduces the inter-correlation effects among the independent variables (Freund, Littell and Creighton, 2003). This analysis was not done. However, the goodness of fit of 88.36% (Table 4.94) of the model discounts these doubts.

The results indicate that there could be other factors impacting on the competitiveness of the electrical and electronics manufacturing sector in Kenya. These include sample size, categorical responses, estimation model or control of independent variables (Allison, 2012; Greene, 2000; Wooldridge, 2000).

**Table 4.93: The Effect of Multicollinearity on the Regression Coefficients of the Independent Variables and Competitiveness**

Model	Unstandardized coefficients		Standardised coefficients			Collinearity Statistics	
	B	Std. error	Beta	t	Sig.	Tolerance	VIF
Technology	3.267	.001	.081	3,267	.000	.056	17.868
Innovation	3.433	.015	.103	228.867	.000	.033	29.934
Market access	4.117	.017	.458	242.180	.000	.049	20.476
Regulations	4.100	.019	.377	215.790	.000	.046	21.910

#### 4.4.6.2 Goodness of Fit Model Summary

The significance of the model was further reaffirmed by the goodness of fit tests in Table 4.94, whereby the coefficient of determination (R square) of 0.8836 confirmed that the model explained 88.36% of the variation or change in the dependent variables. The adjusted R square did not make any difference either, since the model now explained 87.15% of the variations. Similarly the standard error estimate of 0.00001 was insignificant.

Nevertheless, the goodness of fit test in Table 4.94 presents the goodness of fit of the model:

$$Y = b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

being the linear model involving technology ( $x_i$ ) independent variables. The coefficient of determination (R square) of 0.8836 indicated that the model explained 88.36% of the variations in the dependent variable. This meant that the linear model was a good fit in explaining the relationship between the dependent and independent variables.

These results corroborate Muthiani's and Wanjau's (2012) study on the influx of pharmaceutical counterfeits among the SMEs in Kenya and the United Nations University (2013) on patenting, which was in part driven by the need to access markets.

The implications of the study were that market access has a strong influence on competitiveness of the electrical and electronics sector in Kenya. There is, therefore, the need to invest in the operational environment in order to attract investors in products with a global appeal to take full advantage of the globalising markets.

**Table 4.94: Goodness of Fit Test Summary of the Overall Model without the Moderating Variable**

R	0.9400
R square	0.8836
Adjusted R square	0.8715
Standard error estimate	0.0152

#### 4.4.6.3 ANOVA Analysis

The ANOVA analysis in Table 4.95 presents the influence of all the independent variables on competitiveness of the electrical and electronics sector. The results with a p-value of 0.000, which was less than 0.05, indicated that the model was statistically significant in explaining the impact of the independent variables on the competitiveness of the electrical and electronics sector in Kenya. It was, therefore, concluded that the independent variables had significant combined effects on the competitiveness of the electrical and electronics sector in Kenya. The model was suited for the estimation of the contributions of the independent variables on competitiveness.

The findings are corroborated by Warren-Rodríguez's (2008) Mozambican study on the linkage of technology and enterprise growth, and the study by Maru, Chepkwony and Menjo (2012), which reaffirmed the positive effect of technology adoption in productivity improvement. Further, Kleyghan's (2006) and USDC (2012) reaffirmed

the role of technologically-suave human capital complemented with modern innovation skills on improving economic performances and competitiveness.

The implications of these findings were that the four independent variables collectively have a role in explaining the competitiveness of the electrical and electronics manufacturing sector in Kenya. The direction for policy makers is to establish the factors that are easier to manipulate in the prevailing environment. In the current circumstances, technology and market access are easier to manipulate.

**Table 4.95: ANOVA Analysis of the Model without the Moderating Variable**

<b>Model</b>	<b>Sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
Regression	4949445.630	4	1237361.407	.	.000
Residual	.000	16	.000		
Total	4.949E6	20			

#### 4.4.7 Regression Analysis of the Whole Model with the Moderating Variable

The results of the regression analysis of the whole model with the inclusion of the moderating variable are presented in Table 4.90. The regression coefficients of the independent variables remained unchanged at the levels presented in Table 4.96.

**Table 4.96: Coefficients of the Overall Model with the Moderating Variable**

Model	Unstandardized coefficients		Standardised coefficients		Collinearity statistics	
	B	Std. Error	Beta	Sig.	Tolerance	VIF
Technology	3.267	0.001	0.081	.000	0.051	19.499
Innovation	3.433	0.015	0.103	.000	0.033	30.370
Market access	4.117	0.017	0.458	.000	0.028	35.892
Regulations	4.100	0.019	0.377	.000	0.044	22.506
Operational environment	-0.0001	0.00001	0.000	.999	0.038	26.039

In the goodness of fit summary model analysis presented in Table 4.97, the coefficient of determination was 0.8836 indicating that the regression model without the moderating variable explained 88.36% of the variations in competitiveness. In the full model, the coefficient of determination was 0.8987 implying that the model explained 89.87% of the variations, which was an improvement on the reduced model. This implied that the model was suited for study and worked better with the inclusion of the operational environment.

**Table 4.97: Model Summary—Goodness of Fit Test of the Overall Model with and without the Moderating Variable**

	Full model	Reduced model
R	0.9480	0.9400
R square	0.8987	0.8836
Adjusted R square	0.8759	0.8715
Standard error estimate	0.0142	0.0152



These findings corroborated Newton's (2008) study, which established that the 9/11 terrorist attacks did not deter investors locating in the USA. Efficiency and a conducive business environment (Dunning, 1998) were stronger than the threats of terrorism. Similarly, governance challenges in China have not deterred investments either. However, liberalisation in the case of Morocco enhanced the role of fragmentation in the electrical and electronics sector (Afif, 2009).

The implications of these findings are that the operational environment may or may not catalyse competitiveness. In this case, the factors impacting on the competitiveness of the electrical and electronics manufacturing sector outside the independent variables need further research. The operational environment, as presently constituted, does not influence the sector's competitiveness.

#### **4.4.7.1 Partial Correlation Coefficients**

In order to further validate the role of the moderating variable on the independent variables, partial correlation analysis was undertaken (Table 4.98). In addition to the estimation of the partial coefficients on the independent variables, the same were compared with coefficients obtained when other variables were held constant. In the partial correlation analysis, the correlation coefficients ( $p < 0.05$ ) for all the variables were significant implying that the operational environment had an effect on the impact of independent variables on the competitiveness of the electrical and electronics sector.

**Table 4.98: Comparison of Partial and Independent Variable Coefficients**

Control variable	Variables	Partials		Individual variable	
		Correlation	Sig.	Correlation	Sig.
Operational environment	Competitiveness	1.000		1.000	
	Technology	0.465	0.045	0.466	0.038
	Innovation	0.542	0.017	0.623	0.003
	Market access	0.457	0.049	0.580	0.007
	Regulations	0.590	0.008	0.399	0.082

The findings corroborated the study by Kohlbacher, Weitlaner, Hollosi, Grünwald and Grahl (2013) in which environmental dynamism and competitiveness positively moderated the effect of explorative innovation. Similarly, Slater's and Narver's (1994) study established that market orientation effects are long term while those of the business environment are transient but impact positively on performance. Further, institutionalised business arrangements as presented in the studies by Valsamakis and Sprague (2001) and Hazen and Byrd (2012) confirmed that operational business arrangements in which supplier-buyer relationships linking trans-nationals to small- medium-sized manufacturers (SMMs) within supply chains developed effective working relationships with customers. The relationships are enhanced through IT platforms providing interconnectivity.

The implications of the study findings reconfirm that the operational environment in the case of the electrical and electronics sector's competitiveness was not critical for the sector's competitiveness. Fragmented production systems are globalised and, as such, efficiency and competences remain the cornerstones of such production systems leading to competitiveness. The electrical and electronics manufacturing sector in

Kenya should explore the options of participating in global value chains in order to be part of the global business groups.

Overall, the results from the analysis of the whole model corroborated those from the studies by Han and Anantatmula, (2007) and Grabowski & McCormick (1998) and UNIDO (2009) on knowledge sharing in which issues related to availability and usability of technology confirmed the relationships of the different factors with competitiveness. Similarly, Frantzen's (2008) OECD study on competitiveness and technology applications, Njoga's (2013) case study on the role of technology in improving the efficiency and competitiveness of the Kenya Pipeline Company and Kajogbola's (2004) research on the impact of technology on the Nigerian economy confirmed the strong correlation between technology and competitiveness of the manufacturing and services sectors. The findings, however, contradict those from studies by Ongwae (2011) and Mulatu and Withagen (2003) on the effectiveness of regulations in the counterfeits, and Tan's (1996) study of Chinese entrepreneurs, which had established that competitiveness was inversely related to intense regulations. The more developed countries also had a stronger affinity to attract investment and take advantage of available market access (Tomohiko, Matsuura & Poncet, 2008; Pradhan & Singh, 2008).

These findings imply that there was a positive relationship between the electrical and electronics sector's competitiveness and the intensity of technology, innovation, market access and regulations. In this regard, policy architecture should facilitate a technology and innovative culture.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

In light of the paradigm shift to fragmented production systems for the electrical and electronics manufacturing sector in a globalized business environment, this study investigated the determinants of the competitiveness of the electrical and electronics manufacturing enterprises in Kenya. This was done through a two-stage regression analysis—with and without the moderating effects of the operational environment. The key variables investigated were to:

1. Determine the effect of technology in Kenya's electrical and electronics manufacturing enterprises' competitiveness.
2. Establish whether innovation stimulates Kenya's electrical and electronics manufacturing enterprises' competitiveness.
3. Determine if the regulatory framework has a role in stimulating Kenya's electrical and electronics manufacturing enterprises' competitiveness.
4. Establish the effect of market access on Kenya's electrical and electronics manufacturing enterprises' competitiveness.
5. Establish the role of operational environment as a moderating factor on Kenya's electrical and electronics manufacturing enterprises' competitiveness.

## **5.2 Summary of Findings**

From a 30% sample and an 87% response rate, the survey results provided a firm basis for making inferences on the whole population. The integrity of the survey instrument was validated through a pilot, complemented with content validity and reliability, normality tests and discussions with the key ministries of Trade and Industry and the Kenya Association of Manufacturers and the university supervisors. The research was underpinned by Porter's Five Forces and Diamond and Haines value chains competitiveness theories, which together with the Dunning OLI and limitations on management theories influenced investment and location decisions. These were complemented with theories on dimensions of specialisation and categorisation of electrical and electronics products to establish the location of the Kenyan industry in the respective value chains. In spite of the abundance of innovations arising from short-term patents, the lack of managerial and leadership capacity to leverage these opportunities confined the Kenyan industry in the non-tradable electrical and electronics manufacturing segments. The empirical evidence validated the location of the Kenyan electrical and electronics sector in the low value and low volume segments characterised by low technology and low knowledge intensity. Information access on available innovations remains a big challenge to Kenyan policy makers and business community.

Globalisation, technological advancements, economic and societal changes have become critical influences in competitiveness. Further, international trade is increasingly being driven by FDI location and off-shoring making it possible to locate firms in any area of the globe. Against available literature on the competitiveness of

electrical and electronics sectors, the results from the analysis of the primary data were benchmarked to secondary GCI results to establish consistency and comparability with the Kenyan GCI indicators as presented in Table 5.1. The indicators from the primary research were closely aligned to the secondary indicators from the World Bank's annual assessments of the business environment across different countries. This was an indication of the sample being drawn from the same normal population. This paved the way for key recommendations some of which have policy implications.

**Table 4.99: Comparison of GCI Indicators with Findings from the Primary Research**

<b>GCI Indicator</b>	<b>Av.GCI Score 2009-2014 (out of 7)</b>	<b>%</b>	<b>Research Indicator</b>	<b>Findings</b>	<b>Implications</b>
Technology readiness	2.63	37.6	Technology	54% of firms established before 1980 65% of firms concentrate in OEM and repairs	Operating from obsolete technology limits expansion into modern products Low VA production
Innovation	3.45	49.3	Innovation	Less than 30% of firm resources are invested in R&D Over 70% concurrence on the need for investment in knowledge creation for innovation	Low profitability limits investment in R&D. However, software development as demonstrated in MPESA confirms state of innovations in Kenya
Goods market efficiency	4.12	58.9	Market Access	Dominance of domestic and regional markets (81.2%) in low value and volume trade contributing less than 5% of market demand in Kenya	Limitations on market entry strategies and economies of scale thus high cost of production limiting competitiveness
Business sophistication	4.09	58.4	Regulations	Limitations of regulations within the WTO liberalization frameworks. Trade facilitation instruments including trade remedies in the business environment now govern the regulations in the business environment.	Limited profitability impacts negatively of high cost of regulations and finance.
Macro-economic framework	3.71	53.0	Operational environment	Over 60% of respondents agree on the need for conducive business environment and complementary skills, transport and IT infrastructure	Intensification of government support to enhance the business environment and predictability, which impact negatively on investment

The preliminary findings of the study indicated that, except for regulations, the individual effects of the independent variables significantly impacted positively on the competitiveness of the electrical and electronics sector. However, the combined effects of the independent variables with and without the moderating variable are expected to directly influence the Kenyan electrical and electronics sector's competitiveness. The preliminary findings in the study revealed that:

1. The bulk of the Kenyan-originating products falling under electrical and electronics products were characterised by low technology and low-knowledge intensity, which are not traded in the global markets. This was consistent with the Global Competitiveness Index, in which Kenya's technology readiness was rated among the lowest 10% of the countries during the period 2009-2013/14.
2. The continued survival of enterprises depended on the ability of the Kenyan electrical and electronics investors to innovate and upgrade their capabilities and competences by networking and learning from global corporations and the other clusters. However, the SME-based industrial structure denominated by family-based ownerships limited the electrical and electronics sector's opportunities of participating in the fragmented production processes of outsourcing through TNC/MNC partnerships in the GVCs that govern competitiveness in the electrical and electronics sectors.
3. Against the liberalised policy environment, the role of regulations in enhancing the electrical and electronics sector's competitiveness is limited. Priority



should focus on trade logistics, adequate incentives and new skill sets for enhanced productivity.

4. While Kenyan firms were active in the regional markets, they were not integrated into the global value chains whose fragmented production systems now determine the electrical and electronics sector's competitiveness at the global level.
5. Economic factors, in comparison with political stability and business environmental factors had a stronger moderating effect in the operational environment impacting on the electrical and electronics sector's competitiveness.

These findings are consistent with the Global Competitiveness Indices (GCIs), which indicated that the factor performances underpinning Kenya's competitiveness were average and, as such, might not facilitate Kenyan firms' integration into the global value chains. In particular, the good potentials in innovation (Kenya being ranked among the top 50 countries) and wide regional and global market access remain underutilised. Kenya's GCI of 3.75 in 2013 corresponds to a factor-based economy (World Bank, 2013).

The significance of the findings from the study is anchored on the hypothesis tests of the individual and the combined effects of the variables with and without the moderating effect of the operational environment.

### **5.2.1 The Effect of Technology in Kenya's Electrical and Electronics**

#### **Manufacturing Enterprises' Competitiveness**

The contribution of technology to enhance productivity was analysed in the context of its adoption, communication systems, management and operational efficiencies and staff competences. The degree of correlation and levels of significance between competitiveness and technology was positive and significant. This was supported by the correlation coefficient, which showed that 46.6% of the variations in the electrical and electronics sector's competitiveness were explained by technology. The p-value of 0.038 for a 5% 2-tail test was significant since it was less than 0.05. This was further reinforced by the regression analysis, in which the coefficient of determination of 0.217 indicated that technology alone in the model explained 21.7% of the variation or change in the dependent variable. The gradient of 5.962 indicated that a unit change in technology leads to a rate of 5.962 units of positive change in the competitiveness of the electrical and electronics sector. Validation through partial analysis indicated that there was no influence of the operational environment on the effect of technology on the competitiveness of the electrical and electronics sector in Kenya. This means that technology was significant in influencing positively the competitiveness of the electrical and electronics manufacturing sector in Kenya. The findings are aligned to Porter's Diamond on firm strategy and OLI theories in which location of industries is on the basis of market demand and resource availability. These are complemented by management operations aligned to Porter's value chain and Haines' customised logistics theories. Continuous research feeds into the design of new and more competitive electrical and electronics products characterised by short PLC but meeting

the changing consumer demands. The low levels of technology upgrading validated continued production of outdated non-tradable products in the global market. The findings underscored the urgency for the Kenyan business community to adapt to the changing global production techniques and new global products in order to remain in business.

## **5.2.2 Innovation as a Stimulant on Kenya's Electrical and Electronics**

### **Manufacturing Enterprises' Competitiveness**

Information access complemented with staff skill competences underpinned the stimulation effect of innovation on Kenya's electrical and electronics manufacturing sector's competitiveness. Partnerships were the preferred transmission mechanisms in accessing new knowledge and shortages in staff skills and competences. Kenya's promising developments in innovations stem from the latest ICT-related developments in the financial sector, with M-Pesa as the global brand. Further, Kenya is among the top 50 high-achiever countries in matters of innovation. Software development has picked up momentum in Kenya. These findings are consistent with innovation theories of diffusion and knowledge management, where partnerships through peers and networks facilitate ease of information exchange on new innovations; and Porter's Five Forces and value chains competitiveness theories; in which information on new innovations can be passed through new products from substitutes or new entrants. With universal access to the internet, it becomes easier to leverage the government's open access policy to ensure that available research can be shared across different segments of the economy.

The correlation coefficient of 0.623 and a p-value of 0.003 depicted a strong positive and significant relationship between innovation and competitiveness in the electrical and electronics sector. This was further exemplified by the coefficient of determination (R square) of 0.388, which indicated that the model explained 38.8% of the variation of competitiveness of the electrical and electronics sector. The gradient of 9.853 indicated that a unit change in innovation leads to a rate of 9.853 units of positive change in competitiveness of the electrical and electronics sector. In addition, the partial coefficients confirmed the positive effect from the operational environment due to increase in the correlation coefficients. The regression of the whole and reduced model further confirmed the positive and significant roles of innovation in the electrical and electronics sector's competitiveness. Nevertheless, branding for product diversification and networks creates niche market segments.

### **5.2.3 The Role of Regulations in Stimulating Kenya's Electrical and Electronics Manufacturing Enterprises' Competitiveness**

Against a fully-liberalised economy and a globalising business environment, the role of regulations is limited. Technical market requirements play a stronger role. In the case of the electrical and electronics sector, environmental standards and the desire to recycle e-waste is increasingly taking centre stage in the regulatory frameworks impacting on market access. The findings are consistent with Porter's Diamond in which governments can vary policies and regulations to impact on market access. Such interventions serve to anchor new changes in production impacting on economic activities in policy scenarios that ensure continued engagement in the global business. The results are, nevertheless, at variance with enterprise re-organisation to align with

the changed business environment. On the basis of the global Environmental Performance Index (EPI) (2012), Kenya was ranked among modest performers. For example, e-waste management at 10% demonstrates low levels of awareness on recycling as part of environmental protection. Implementation of such policy options requires strong self-governance across the players. It is not enough to have legislations in place.

The coefficient of correlation of 0.399 between competitiveness and regulations indicated that 39.9% of competitiveness was explained by regulations, while the p-value of 0.083, in excess of 0.05, depicted a weak and less-than-significant relationship between regulations and competitiveness. This was further corroborated in the coefficient of determination (R square) of 0.159, which meant that regulations on their own explained 15.9% of the variations in the competitiveness of the electrical and electronics sector. On the basis of ANOVA analysis, a unit change in regulations leads to 2.635 units of positive change in the competitiveness of the electrical and electronics sector. This, however, was not significant at the 0.05 p-value level. However, the partial analysis confirmed the positive ( $p < 0.05$ ) effect with the operational environment. This suggested that the operational environment has a positive effect on regulations in the electrical and electronics manufacturing sector in Kenya.

## **5.2.4 The Effect of Market Access on Kenya's Electrical and Electronics**

### **Manufacturing Enterprises' Competitiveness**

In the globalised business environment, market access was anchored on trade logistics entrenched in respective trading and investment agreements. In the case of Kenya, the domestic market was the dominant (95%) outlet of Kenyan-originating products. The regional markets accounted for less than 5% of the exports, with practically nothing going into the international markets. Thus, the effect of expanded market access on Kenya's electrical and electronics manufacturing enterprises had not created any competitiveness. There was no effective participation in the supply chains at the national, regional and global markets, outsourcing and related supply chain relations with support logistics and institutions. Instead, firms started outsourcing non-core functions with the advent of full liberalisation after 2000.

The few manufacturing firms in operation were concentrated in firm linkages with short value chains entrenched in the manufacture of basic electrical and electronics equipment for final use. There are no institutionalised customer/supplier relationships or memberships in global value chains consistent with fragmented production systems that govern competitiveness in the electrical and electronics sectors. Instead, exporters either worked directly with overseas distributors and overseas customers (53.8%) or through the local offices of multinationals using technology—the internet (46.2%). The facilitating logistics to GVCs are equally underdeveloped—lacking in modalities of information access. The findings were consistent with the current international market access scenarios in which entry strategies remain the more effective mode of market access in liberalised and globalised business environments. The results were

also inconsistent with competitiveness principles as portrayed by Porter's Five Forces and value chain forces of competition. Neither were the trading systems in place consistent with GVCs in which there is dominance of internationally-operating buyers and retailers (UNIDO, 2009). The net effect was that the industry is underdeveloped. The implication of the findings is that firms are required to choose their niche products and markets in order to sustain competitiveness.

The findings on the effect of market access on the electrical and electronics sector's competitiveness established a correlation coefficient of 0.581 and a p-value of 0.007 for a 2-tail test. This depicts a strong positive and significant relationship between market access and competitiveness, in which 58.1% of competitiveness was explained by market access. The coefficient of determination (R square) of 0.338 further consolidated the influence of market access indicating that the model explained 33.8% of the variations in competitiveness. Adjustment of the R square did not change the results substantially, having reduced the explanatory behaviour of the predictor to 30.1%. The gradient coefficients of 2.790 confirmed that a unit change in market access was positive and lead to 2.790 units of positive change in competitiveness. The positive effect from the partial analysis in which there was an increase in the correlation coefficients, taking into account the effect of the operational environment, indicated that market access was significant in the Kenyan electrical and electronics sector's competitiveness.

### **5.2.5 The Role of Operational Environment as a Moderating Factor on Kenya's Electrical and Electronics Manufacturing Enterprises' Competitiveness**

The economic factors, particularly trade logistics and the macroeconomic operational environment, contribute substantially to an effective business environment. Nevertheless, the changing business environment dictates on the critical factors at any one time in order to attract investment into the country. In the case of politics, stability and security remain the anchors on which investors make their decisions. These results corroborate the OLI theories in which location-specific attributes are embodied in economic, political and cultural strictures.

All the coefficients of the independent variables were positive and significant in explaining the relationship between all the four independent variables and competitiveness of the electrical and electronics sector in Kenya. The interrogation of multicollinearity in the model through the Variance Inflation Factor (VIF) gave an indication of poor estimation of variable coefficients. However, this was discounted by the goodness of fit in which 89.87% variations in the model were explained variables under study. This confirmed the suitability of the model in the study of the variables impacting on Kenya's electrical and electronics sector's competitiveness. Similarly, the partial correlation regression analysis coefficients were not different from those estimated for the independent variables individually.



### **5.3 Conclusion**

Based on the findings of the study, there was a strong awareness among both the public and the private sectors on the changing global business environment. This necessitates change in the Kenyan production processes. The study findings concluded that technology, innovation and market access individually and collectively are expected to positively influence the electrical and electronics sector's competitiveness in Kenya. These are enhanced with the moderating effect of the operational environment. The effect of regulations, on the other hand, was peripheral. However, when the operational environment is taken into account, the impact of regulations is significant. In spite of these results, Kenyan firms have not taken up modern fragmented high technology and knowledge-intensive manufacturing that defines the competitiveness of the electrical and electronics sectors globally in line with Porter's Five Forces and Porter's Diamond and value chain, Haines' value chain and short PLC theories.

Industrial production systems have remained traditional and vertically integrated, specializing in the manufacture of limited sets of hardware, electrical machinery and appliances; the bulk of which are not traded in global markets. Production processes have not leveraged freely the available patents to modernize industry production.

Overall, there is urgency in intensifying capacity building while benchmarking international best practices. The results imply that the Kenyan electrical and electronics sector remains underdeveloped, operating from the bottom of the value chain. Unless and until the Kenyan electrical and electronics manufacturing enterprises integrate into the GVCs, the industry is likely to collapse in the near future.

Left on its own, the industry will not restructure so the government intervention is necessary. The anticipated benefits will be by way of new job opportunities, better and modern products and services, diversified economic structure and new revenue streams for the government.

#### **5.4 Recommendations**

The recommendations aligned to the findings of each specific objective of the study are summarized in the following sections. They underscore the urgency for the Kenyan business community to adapt to the changing global production techniques and new global products in order to remain in business. Of interest is the electrical and electronics sector, which accounts for over 21% of global trade.

Kenya stands to benefit from the off-shoring strategy; giving local firms the opportunity to innovate and upgrade their capabilities by moving up the value chain into the medium and high-technology segments and, as such, participate in global trade. There will also be urgent need to deepen the implementation of Vision 2030 by expanding investments in the enablers—infrastructure, energy, governance, security and trade facilitation; in order to improve on competitiveness and linkages into the regional markets. This shall best be cultivated through national, regional and global partnerships, with strong linkages with the private sector, which expand the resource base and competences. This would assist the private sector build on strategies for coping with competition in a globalised environment. Unless Kenya diversifies out of product/hardware manufactures to the more competitive service-related sectors, the chances of integrating into the GVCs are limited. Diversification would further facilitate Kenya to benefit from the expansion of the regional markets and the

globalising markets. The solutions lie in the diversification of the product lines to move up the value chain and participate in the globally-traded products and services.

#### **5.4.1 Technology Upgrading for Enhanced Competitiveness of Kenya's**

##### **Electrical and Electronics Manufacturing Enterprises**

Besides the limitations of family-based ownership, access to modern technology in support of the electrical and electronics sector's competitiveness seemed a major constraint to local Kenyan firms. There was a convergence of minds across the public and private sectors on the need for manufacturers to undertake further investment to upgrade and modernise their technology to remain relevant in the current competitive business environment. Since most firms are SMEs, there is need to evaluate the possibility of establishing a technology fund or investing in promotion of strategic partnerships for purposes of encouraging technology transfer for enhanced productivity and graduation to higher value-chain segments. Promotion of the production of non-reusable electrical and electronics products at relatively cheap prices presented a unique window for Kenya to link into the GVCs. Manufacturers have to employ new strategies to either remain in or enter new markets. This includes adopting IT platforms for management and trading and re-skilling the workforce.

Going forward, suggestions from the public and private sector centred on policy guidance from the public sector, skill upgrading to align competences with market requirements and to meet the challenges of a changed global business environment. Other proposals focused on intensified R&D for quality innovation, technology upgrading for enhanced productivity, IT-facilitated distribution networks that underpin

fragmented production systems and managerial entrepreneurship backed by e-business management systems. In particular, there is urgency in going into partnership with MNC/TNC specialising in the manufacture of more affordable non-reusable electrical and electronics products dominating the global markets.

#### **5.4.2 Strengthen R&D to Stimulate Innovations in the Electrical and Electronics Manufacturing Sector**

With universal access to the internet, it is possible to leverage and commercialise expired patents or enter into partnerships in order to access more modern production processes in new products and services for enhanced competitiveness. This can be achieved through strategic partnerships with MNCs/TNCs that provide a cheaper avenue for technology transfer, linkages into GVCs, markets, access to R&D for continuous renewal and exposure to modern efficient managerial competences and technical skills. The IT platforms as integral infrastructure for information dissemination stand to facilitate linkages between local SMEs and MNCs. The partnerships can also create opportunities for exposure to new environments and skills development and upgrading. For a start, such linkages could be exploited through EPZ arrangements that come with key production-based incentive packages. The Kenyan electrical and electronics sector did not appear to take full advantage of the power of the internet as a marketing platform. However, software and applications research has picked up judging from M-Pesa innovations in the financial sector.

Private sector companies were too small to undertake innovative R&D on their own. Strategic partnerships with reinvigorated universities stand to benefit the whole economy. In addition, the mandatory information disclosure in the public sector will ensure that departmental researches are made public. This would save the business community both time and resources to undertake feasibility studies in similar fields. There is need to enhance and leverage these competences and expand the scope of core R&D outside agriculture and health sectors. Under this scenario, it would be prudent for the government to review the investment framework to make it attractive for investors to locate in Kenya for purposes of serving the region. A case in point to be emulated is the establishment of Konza Technology City to spearhead the transformation into a knowledge economy. The setting up of accreditation institutions to link academia with industry is also another step in the right direction.

### **5.4.3 Stakeholder Sensitization on Implementation of International**

#### **Commitments and Regulations for Enhanced Competitiveness**

The structural rigidities that have condemned Kenya to the lower value chains have to be unlocked through adoption of appropriate policy architecture, capacity building and institutional strengthening. In a liberalised and globalised business environment, in which standards and rules are harmonised, the role of regulations is limited. Instead, technical market requirements including environmental laws underpin a wide range of business decisions. In most cases, such regulations are implemented through partnerships across the geographical divide, creating opportunities for upgrading technology and skills with consequent improvements in competitiveness. Through crafting appropriate business-friendly policies and regulatory frameworks attractive to

investors; the government would have a chance to realise the aspirations of Vision 2030 in poverty reduction, employment and wealth creation for the nation. In any case, self-governance is critical in the fragmented production systems that govern the electrical and electronics sector's fragmented production systems.

#### **5.4.4 Product Diversification for Enhanced Market Access of the Kenyan**

##### **Electrical and Electronics Products and Services**

In order to take advantage of the liberal regional and global markets, Kenyan manufacturers have to identify niche products with associated global value chains and markets from which to operate. This would entail participating in outsourcing arrangements and networking MNCs/TNCs with SMEs based in developing countries. It would also facilitate productivity enhancement while moving up the value chain. There is need to improve trade and business logistics in order for Kenyan firms to remain competitive.

#### **5.4.5 The Role of the Operational Environment on the Competitiveness of**

##### **Kenyan Manufacturing Enterprises**

The operating environment had a beneficial effect on the electrical and electronics sector's competitiveness. There is need to maintain stable macroeconomic and political stability, seamless connectivity to markets and a conducive business environment to facilitate Kenyan businesses exploit regional and global markets. Against a liberalised policy environment anchored on multilateral regulatory frameworks, the critical issues for taking full advantage of the global and regional markets lie in the improvement of the operations of the markets; and in particular,

addressing trade logistics and cost of production. Political stability is critical for business investments; as such, governments are very essential in business and by extension competitiveness. The implications of the results were that businesses have to adapt to the changing business environment in order to survive.

In the case of the operating environment, the business/industry culture and consumer tastes, corporate governance, e-commerce, partnerships and political stability impact on business decisions and operations. The GCI rating of the macroeconomic environment was unstable; lacking predictability and, as such, not attractive to investment. The moderating effects of the operational environment are more pronounced in the economic factors. In this regard, concerted efforts have to be made in improving the business infrastructure to facilitate private sector partnerships with foreign investors.

### **5.5 Areas for Further Study**

This study did not cover the full complement of the factors considered in measuring the GCI critical in sector competitiveness. Nevertheless, in the case of Kenya, further research on what is really keeping away electrical and electronics investors from the country is needed. In particular, there will be need to establish the lack of MNC/TNC interest in partnering or outsourcing to the Kenyan market. This may include exploring the nexus for unlocking the stringent culture of family-based ownership and the strong affinity to traditional manufactures to move into the more lucrative outsourced production arrangements, align production with global demand to diversify the country's product/service range as well as the needed interventions to migrate part

of the electrical and electronics sector into the EPZ facilities and the dedicated investment parks prescribed in government policies.

Other research could focus on what has stopped the private sector from taking up opportunities coming with regional markets with the abundant advantages of geographical proximity, cultural similarities and special trading arrangements. Research could also be done to find out the reasons for the handicaps in leadership capacities to leverage free intellectual patents to diversify industrial activities. Similarly, research could also be done on what keeps firms from adopting policy frameworks conducive to technology-loaded FDI inflows to address productivity challenges; required action to address the inadequate human resource competences in knowledge diversification and management in exploring new and better options in product development; and capacity constraints in formulation and enforcement of regulations aligned to fragmented and outsourced production processes. Research could also focus on the role of politics, culture and intermediation of logistics in the present-day competitive environment.



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## APPENDICES

### Appendix 1: Letter of Introduction

**Margaret K. Chemengich**

Mezzanine Floor, Kenya Reinsurance Plaza, Taifa Road

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P.O Box 50968 – 00200, Nairobi Tel/fax: 020-315450

Email:chemengichmail@yahoo.com

**April 2012**

XXXXXXXX

**Dear Respondent,**

I am a post-graduate student at JKUAT currently pursuing a doctorate degree in Business Administration. To qualify for the PhD, I am required to carry out a research on a topical issue in the Kenyan economy with a view to informing the policy stance or knowledge. I write to kindly request you to complete this questionnaire, with the assurance that all the information so collected will be treated with utmost confidentiality.

You have been selected on the premise that you are better placed to provide us with information that will assist in establishing the *Determinants of Competitiveness of the Electrical and Electronics Manufacturing Enterprises in Kenya*.

While this research is primarily for academic purposes, the findings will assist in further improvement of the Kenyan policy framework and business environment. In particular, this study will facilitate a paradigm shift in Kenya's trade and investment strategies by bringing to the fore opportunities of globalisation in which SMEs can



integrate into global value chains dominating competitiveness currently. This study will inform the different stakeholders of the paradigm shift in which the more competitive firms now operate from fragmented networked production systems. This entails off-shoring and outsourcing of activities the firm may not have core competences for. It is further hoped that the findings may also create an opportunity for a more collaborative private sector locally and internationally.

Thank you for your effort in completing this questionnaire.

Margaret K. Chemengich  
HD 433-CBDN-1445/2010

## Appendix 2: Questionnaire to the Private Sector—Electrical and Electronics

### Manufacturers

The questionnaire is designed to gather information on “*Determinants of Competitiveness of Electrical and Electronics Manufacturing Enterprises in Kenya.*” The electrical and electronics industry includes companies that design, produce, service, install and distribute products & systems consisting of electrical and electronics products and components, consumer and industrial products and which may contain embedded or loaded software to provide an operational device or network. This questionnaire is to be completed by the private sector senior management, preferably, the CEO or the operations manager. Please complete each question by ticking the appropriate response reflecting the pertaining situation or by giving your opinion as truthfully as possible for the open-ended questions. Your response will be completely anonymous and will be used by the researcher for the purpose of this study only. All the information in this questionnaire is CONFIDENTIAL. The contacts so provided shall only assist in making follow up. In case of any queries, please contact Margaret K. Chemengich on mobile telephone number: 0722314416, or e-mail: [chemengichmail@yahoo.com](mailto:chemengichmail@yahoo.com)

#### 1.0 Background information

Please provide the following identification information.

<b>Name of firm</b>	
<b>Address</b>	
<b>Tel</b>	
<b>Email</b>	
<b>Website</b>	
<b>Number of employees</b>	
<b>When was company set up</b>	
<b>Size of company assets</b>	
<b>Name and contacts of officer completing the questionnaire</b>	Name:
	Office Tel:
	Mobile:
	Email:
<b>Date questionnaire was completed</b>	

**1.1 Business Ownership/Legal status** (Tick as appropriate)

Please indicate the subsector (s) of your business, ownership, and legal status as presented below where SOE is State Organisation or Enterprise.

**(a) Core activities and level of business enterprises** (Tick)

Broad categorisation on basis of use	Category	Business Enterprise	
		Single	Multiple
Electronic Appliances			
Electronic Components (Automotive electrics & instruments; medical appliances;			
Computer & Office Equipment			
Telecommunications- Broadcasting,			
Consumer Electronics (TVs, Air cons, )			
Industrial Electronics			
Design, R & D			
Other (Specify)			

**(b) Legal status** (Tick)

Public/ (SOE)    
 Private    
 Joint Venture    
 Family    
 Partnership

**(c) Where is your firm headquartered? And where are the branches? State**

Countries	City in which HQ is located	Branches

**(d) Approximately what share (percentage) of your firm's financing comes from:**

Source of financing	%
Private equity (e.g. self-financed family, friends & partners)?	
Public funding (e.g. through stock market listing)?	
Bank overdraft or loan (debt)?	
Venture capital or business angel	
Parent company	
Other( Specify)	

## 2.1 COMPETITIVESS

### 2.2 Source of firm income

(a) What proportion of your income originated from your local and HQ office?

% share

Broad Category	2000-2005		2006-2010		2011	
	% share of Firm Revenue	% share of HQ Revenue	% share of Firm Revenue	% share of HQ Revenue	% share of Firm Revenue	% share of HQ Revenue
Electronic appliances						
Electronic Components						
Computer & Office Equipment						
Telecommunications- Broadcasting, equipment						
Consumer Electronics (TVs, Air cons, etc)						
Industrial Electronics						
Design, R & D						
Others (Specify)						

(b) What are your firm's main activities (as an approximate percentage of sales)?

% share

Main activities	2000	2005	2010
Product manufacturing			
Service delivery			
Integrated systems or solutions			
Wholesale, retail & distribution			
Support, after sales service & repair			
Other (please specify)			

(c) Against other players in the industry, where would you place your firm's activities on a continuum of Volume and Value (please tick one box only)?

(i) Volume:

High                       Medium                       Low

(ii) Value:

High                       Medium                       Low

### 2.3 Export Performance vis-a-vis Local Sales

#### (a) Export Performance against total production, %

Please give an estimate of the sales for each sub-sector to local, regional and international markets, and where possible specify the regions of export destination to regional markets ( COMESA, EAC, rest of Africa) and/or international markets ( Europe, USA, North and S. America, Asia, China, Middle East, etc.). (State % for entry as appropriate) % share.

Year	2000-2005			2006-2010		
Product Type	Local (Kenya)	Regional Markets	Inter-national Markets	Local (Kenya)	Regional Markets	Inter-national Markets
Electronic Appliances						
Electronic Components						
Computer & Office Equipment						
Telecommunications-Broadcasting, equipment						
Consumer Electronics (TVs, Air cons, etc)						
Industrial Electronics						
Design, R & D						
Others (Specify)						

#### (b) Export Markets

If you export, what are your most significant country export markets, and approximately what percentage of your total sales goes the different markets? Please give an estimate of the sales for each sub-sector to local, regional and international markets, and where possible specify the countries of export destination, where regional markets ( COMESA, EAC, rest of Africa) and/or international markets (Europe, USA, North and S. America, Asia, China, Middle East, etc.). (State as % of total exports).

Product	Regional market (Name)	Countries (Name)	% of exports	Inter-national markets (Name)	Countries (Name)	% of exports
Electronic appliances						
Electronic Components						
Computer &						

<b>Product</b>	<b>Regional market (Name)</b>	<b>Countries (Name)</b>	<b>% of exports</b>	<b>International markets (Name)</b>	<b>Countries (Name)</b>	<b>% of exports</b>
Office Equipment						
Telecommunications- Broadcasting, equipment						
Consumer Electronics (TVs, Air cons, etc.)						
Industrial Electronics						
Design, R & D						
Others (Specify)						

#### 2.4 Source of Inputs

If you source some of your inputs outside the country, what are your most significant country sources, and approximately what percentage of your total inputs comes from these sources? Please provide an estimate of the inputs for each sub-sector from local, regional and international markets, and where possible specify the regions of import source – regional markets (COMESA, EAC, rest of Africa); international markets (Europe, USA, North and South America, Asia, China, Middle East, etc) % share.

<b>(a) Local, %</b>	<b>(b) Regional market</b>			<b>(c) International markets</b>		
	<b>Region</b>	<b>Countries</b>	<b>% of imports</b>	<b>Region</b>	<b>Countries</b>	<b>% of imports</b>

**2.5 What factors have influenced your firm activities to diversify and increase the value in the last 5-10 years?**

Factors influencing business growth	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Done nothing new					
Research and Development					
Entered into Partnership with local investor					
Entered into Partnership with regional investors					
Entered into Partnership with international investors					
Access to support industries					
Other (Specify)					

**2.6 What other factors have impacted on the growth of your firm?**  
(Leaving aside cyclical market conditions)? (Please Tick)

Barriers to growth	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Infrastructure					
Access skilled staff					
Competitors in particular markets					
Local suppliers					
Local customers					
Local support services					
International support services					
Venture capital & other finance					
Cost of regulatory compliance					
Other, please specify					

## 2.7 What is your Policy Stand on Partnerships

Opinion on Partnerships	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Partnerships form constituent part of management in own business					
Contractual policy or agreement for managing your partnership					
Other (specify)					

## 2.8 Please specify the type of Partnerships you engage in for production and sales in the different markets:

(Tick against source / destination markets)

Partnership system	Production			Sales		
	Local	Regional	Inter-national	Local	Regional	Inter-national
Contracts						
Outsourcing						
Agency						
Vertical						
Other (specify)						

## 2.9 If you export, what are the main ways you manage your exporting?

(Tick against Yes or No as appropriate)

	YES	NO
Use overseas distributors		
Have own office(s) overseas		
Enter joint ventures with organizations overseas		
Enter alliances with multinational firms overseas		
Work directly with customers overseas		
Work with local offices of multinationals		
Use internet / electronic delivery		
Other (please specify)		



**2.10 Why have you adopted your current business management structure?**

(Tick one entry for each construct)

Reasons for management structure	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
To take advantage of preferential market access in regional agreements					
To avoid stringent market requirements in the international export markets					
To service existing contracts					
To take advantage of change in consumer tastes					
To fill gaps due to shocks or destabilization of substitutes					
To cope with lost market share due to contraband and counterfeits					
To cope with competition					
To cope with higher demand due to lower prices					
To leverage technology and innovations from partners					
Due to capacity constraints					
Others (specify)					

**2.11** Do you think Kenyan manufacturing industry is ready to participate in the global value chains where multinational outsource part of their production segments?

.....

.....

.....

**2.12** What additional interventions are required for Kenyan manufacturing sector to participate in the global value chains?

.....

.....

.....

**2.13** Are you a member of any global value chain?

Yes..... No.....

**3.0 REGULATIONS**

**3.1 Kenya has liberalised all sectors of its economy. Please rate the following regulations on basis of the impact they have on your business?**

(Tick one entry for each construct)

Impact of regulations on business performance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Trade and Investment regional/international agreements have created opportunities for private sector					
Deregulation has resulted in lower consumer prices making local products uncompetitive					
Stability of Macroeconomic and fiscal policies have intensified competition from increased consumer varieties					
Standardization of rules and procedures (laws) has improved competition					
Standardisation processes benchmarked to international best practice provide motivation to investors					
Market Access to EU Market is for agricultural products					
Incentive schemes are selective targeting foreign investors					
Anti -Corruption laws are working					
Counterfeit regulations work in a market economy					
Anti-dumping laws have impact at firm level					
Private property rights systems have encouraged foreign investors					
Consumer protection rights facilitate customer access to cheap products					
International commitments on Labour policies have stabilised labour costs					
International commitments on environment protection laws have improved product safety					
International requirements on recycling work in Kenya					
Private sector self-governance rules have improved competition					
Others (Specify)					

**3.2 What are some of the key policy and regulatory frameworks that you feel require urgent government action. (Tick one entry for each construct).**

Policy and regulatory frameworks requiring government intervention	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
International labour and environment laws					
Labour policies on minimum wage					
Productivity based wage guidelines					
Worker unions policy					
Public sector Capacity to enforce laws and regulations					
Institutional structures for policy implementation					
Competition from lower import tariffs					
Meeting Changing customer tastes					
Capacity to meet technical market requirement					
Management of trade barriers					
Competition from Chinese and Asian imports					
Other (specify)					

**3.3 What are some of your views on globalisation?**

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

**3.4 How has it affected your business? .....And in which ways? .....**

.....  
 .....

**4.0 TECHNOLOGY**

Technology is a key determinant on productivity and associated competitiveness in businesses.

**4.1** When did you last upgrade your plant/technology?  
(State year).....

**4.2** In your view which are the most critical issues with regard to technology adoption in the electrical and electronics sector that should be prioritized in the current business environment? (Tick one entry for each construct).

Critical issues in technology adoption	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Investing in specialised modern technology					
Going into partnership with better endowed partners that can introduce new technology in the manufacturing sectors					
Investing in a flexible business strategy in order to cope with the changing consumer demands					
Adopting contemporary fragmented production systems governing competitiveness					
Investing in modern distribution systems					
Undertaking continuous staff development in order to cope with changing market requirements					
Investing in new products dominating the global markets					
Modernizing communication and information and systems					
Others (Specify)					

**4.3** Is your company participating in any partnership? Yes / No

**4.4** Is it ready for local or foreign Partnership? Yes / No

**4.5** What would be the key driving factor for your company to enter into a partnership?

.....

.....

.....

## 5.0 INNOVATION

To help us understand the ways in which your firm develops new products and services and implements new processes, please specify the sources of information, ideas, and the nature and extent of Research and Development (R&D) activities, staff training undertaken that contribute to this process.

**5.1** In your view which of the following contribute to innovation? (Tick one entry for each construct)

Construct:	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Knowledge sharing and learning					
R&D for continuous renewal					
E-business platforms					
IT facilitated Communication networks for coordination and collaboration					
IT assisted management systems					
Value Addition					
Development of human capital to bring new ideas					
Branding					
Others (specify)					

**5.2** How does your firm develop new products?

(a) Approximately what share (percentage) of your current sales revenue comes from products or services that were: (Please estimate percentage share of sales)  
% of sales

Status of products	% of sales
Introduced within the last year	
Introduced between 1 and 5 years ago	
Introduced between 5 and 10 years ago	
Introduced more than 10 years ago	

(b) Does your firm have formal quality accreditation? ..... Yes / No

(c) Does your firm have any formal quality management procedures or systems in place:

(i) For all operations ..... Yes / No

or

(ii) Part of your operations? ..... Yes / No

(iii) Does your firm have any formal knowledge management system(s) in place? Yes / No.....

**5.3** From where do you get information about new technical developments?  
(Tick one entry for each construct)

Source of information on new technical developments	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
In-house R&D group					
Other internal sources (e.g. existing employees)					
R&D institution, university					
Government ministry and institutions					
New employees					
Suppliers					
Customers					
Professional or industry associations					
Professional publications & journals					
Trade and industry magazines					
Discussions at conferences & trade shows					
Discussions at industry networking functions					
Other, please specify					

**5.4** From where do you get information about new products or services?  
(Tick one entry for each construct)

Source of information on new technical developments	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
In-house R&D group					
Other internal sources (e.g. existing employees)					
R&D institution, university					
Government ministry and institutions					
New employees					
Suppliers					
Customers					
Professional or industry associations					
Professional publications & journals					
Trade and industry magazines					
Discussions at conferences & trade shows					
Discussions at industry networking functions					
Other, please specify					

**5.5** What are your firm's main sources of R&D funding?  
(Tick one entry for each construct)

Source of R&D resources	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Internal resources (e.g. funded from sales revenue)					
Alliances and cooperative arrangements (e.g. R&D cooperatives,					
Government programs and grants					
R&D tax concession					
Subcontracting from other firms					
Other, please specify					

**5.6** In case your firm carries out own internal research, what proportion (%) of your revenue is dedicated to R&D annually (State) .....

**5.7** How is research conducted in your firm?  
(Tick the appropriate entries for the constructs)

Performance of research	Tick	Remarks
In house (i.e. within your firm)		
In partnership with other firms locally		
In partnership with other international firms		
In partnership with Universities or research institutes		
Contracted out to small to medium enterprises (SMEs)		
Contracted out to multinational enterprises (MNEs)		
From expired patents		
Contracted out to Universities or research institutes		
Other, please specify		

**5.8** Is research necessary for your company's continued competitiveness in the market? Yes / No .....

**5.9** What proportion of your sales revenue is spent on research? State percent.  
.....

### 5.10 Skills development

Your response on your firm's employees and skills will enable us to understand the sector's skills profile and the skills required in the industry.

(a) For the year 2011, what percent was your firm's wages & salary expenditure (excluding contractors)?.....

(b) For the year to 2011, what percent was your firm's expenditure on contractors & agency staff?.....

(c) Approximately how many people did your firm employ (in 2011)?

Staff category	Number
Full time	
Part time	
Casual	
Contractors or agency staff	
Other (specify)	

(d) What, if any, skills are in short supply in your firm now, or do you foresee may be in short supply in the future? (Tick one entry for each construct as many as apply)

Skill type in short supply	Now	Future
People management skills		
Project management skills		
Business, finance & administration skills (incl. IT)		
Technical, professional & engineering skills		
Marketing & sales skills		
Other, please specify		

(e) Approximately how many of your firm's employees are:  
(Please enter approximate number)

Staff categories	Numbers
Senior Managers	
Professionals (e.g. IT programmers, engineers, etc.)	
Technically qualified manufacturing, production & tradespersons	
Unqualified manufacturing, production & tradespersons	
Store persons, transport workers, etc.	
Sales, marketing and customer service	
Business support professionals (e.g. accountants, auditors, etc.)	
Clerical	
Other, please specify	



- (f) Does your firm have formal education & training policies or procedures in place to ensure that employees further their education/develop skills?.....Yes/No

## 6.0 MARKET ACCESS

### 6.1 Suppliers, Customers and Supply Chain Relations

We would like to know about your supply chain relationships and the importance of local, national and international linkages. Suppliers include all organizations that provide goods and services to your firm– including accountants, financial institutions, R&D institutions, educational and training organizations – as well as the suppliers of components or direct inputs. Customers are organizations or individuals who purchase your goods and services. They may other firms or end users. The supply chain refers to the entire chain of activities from raw materials to end products.

- (a) Who are your 3 main suppliers (by value), and approximately what share of your supply costs do they represent? (If you prefer not to name them, leave the name out and we will identify them as S1, 2 & 3).

Suppliers	% share of supply costs
Supplier 1 (S1)	
Supplier 2 (S2)	
Supplier 3 (S3)	

- (b) Where are these suppliers located? (Please tick one box for each supplier)

Suppliers	Within Kenya	EAC	COM-ESA	Europe	China	Asia	Other
Supplier 1 (S1)							
Supplier 2 (S2)							
Supplier 3 (S3)							

- (c) What is the main item supplied to you by each of these suppliers?

(Please tick one box for each supplier)

Items \ Suppliers	S1	S2	S3
Materials & Components			
Software to be embedded in your products or services			
Machinery & Equipment used in production			
Technical Services (e.g. R&D, design, prototyping)			
IT Applications Software & Services			

Business Services (e.g. Marketing)			
Banking & Financial Services			
Human Resources & Recruitment Services			
Other (please specify).....			

(d) Who are your 3 main customers (by sales value), and approximately what share of your sales revenue do they represent? (If you prefer not to name them, leave the name out and we'll identify them as C1, 2 & 3).

Suppliers	% share of sales value
Customer 1 (C1)	
Customer 2 (C2)	
Customer 3 (C3)	

(e) Where are these customers located?

Suppliers	Within Kenya	EAC	COM-ESA	Europe	China	Asia	Other
Customer 1 (C1)							
Customer 2 (C2)							
Customer 3 (C3)							

(f) What type of organization is each of your 3 main customers?  
(Please tick one box for each customer)

Organisation \ Customer	C1	C2	C3
Firms that are end users			
Firms that are Original Equipment Manufacturers			
Government			
Other public institutions (e.g. Universities)			
End / Household consumers			
Other (please specify).....			

(g) Is there a dominant player in the 'supply chain' that your firm operates in? (e.g. a firm with significant market share, major supplier or buyer).....Yes / No

(i) If yes, what is its name? (Optional).....

- (ii) If yes, what type of organization is it? (Please tick or put an 'X' in one box only) Tick

Type of organisation	Tick
Multinational firm	
Indigenous Kenyan firm	
Government organization	
Non-government, not-for-profit organization	
Other, please specify	

- (h) Where is the value in the 'supply chain' that your firm operates in (i.e. where the money is made)? (Please tick or put an 'X' in one box only) Tick

Supply chain	Tick
Research & development	
Design	
Supply of machinery & equipment	
Supply of materials & components	
Production / manufacturing	
Branding & marketing	
Wholesale & retail	
Other, please specify	

- (i) Is your firm involved in any joint ventures, alliances, partnerships or network? (Please tick or put an 'X' where applicable)

Activity	Joint Venture	Alliance	Partnership	Network
Research				
Product development				
Manufacturing				
Service delivery				
Marketing & Sales				
Delivery & order fulfilment				
After sales service & support				
Other (please specify).....				

- (j) Does your firm have close and/or regular interactions with other organizations on compliance and development? Tick

Standards and Compliance		Support and development	Tick
Kenyan standards organizations		Education & Training	
Overseas standards organizations		R&D	

Environmental protection		International Business Networks	
OH&S		Industry Groups	
Testing & Conformance		Government programmes	
Business regulation		Other (Specify)	
Quality control & accreditation.			
Other (please specify)			

## 6.2 Logistics

**6.2.1** Does your firm have any integration with external logistics with suppliers/distributors? (Tick one)

Yes

No

**6.2.2** Does your firm outsource any of its activities? (Tick one)

Yes

No

**6.2.3** Do you have a logistics department? (Tick one)

Yes

No

**6.2.4** The following aspects of logistics are carried out as part of strategic management in your firm (Tick one entry for each construct)

Role of logistics in management	Strongly agree	Agree	Neutral	Disagree	Strongest disagree
	5	4	3	2	1
Information network with suppliers					
Maintaining a website					
Subscribing to international data bases					
Joint development in different clusters					
Information sharing					
Method of procurement					
Others (specify)					

**6.2.5 Why does your firm undertake these types of logistics?**

(Tick one entry for each construct)

Why undertake logistics	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Monitor Competition					
Sustain Market access					
Reduce stock piling					
Customer outreach					
Sustain partnerships					
Other (specify)					

**6.2.6 What logistical changes have taken place in the last 5 years?**

(Tick one entry for each construct)

Changes in logistics in last 5-years	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information network with suppliers					
Maintaining a website					
Subscribing to international data bases					
Joint development of logistics in different clusters					
Internet based Information sharing					
On line Business transactions					
Others (specify)					

**6.2.7 What challenges have you encountered in business logistics?**

(Tick one entry for each construct)

Logistics challenges	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Poor internet connectivity (slow, lacking)					
Impact of differences in time zones					
Servicing orders timely					
Information networks to facilitate information sharing with buyers and suppliers					
Maintaining an interactive website					
Subscribing to international data bases					
Others (specify)					

**6.2.8** In your opinion, what should be done on priority basis to address these challenges? (Select one entry for each construct)

Proposals for strengthening business logistics	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Capacity building					
Government facilitation in identifying external partners and building the logistic networks					
Maintenance of databases along the same international requirements by both public sector agencies and private sector organisations					
Others (specify)					

**6.3** Does your firm outsource some of its activities? (Tick one)

Yes  No

**6.4** When did your company initiate outsourced activities?

(State year).....

**6.5** Why has your firm opted to outsource some of its activities?

(Tick one entry for each construct)

Reasons for outsourcing	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Pressure to reduce costs					
To tap into new technology					
Pressure to meet customer satisfaction					
Market expansion					
Reduce work force					
Minimise supplier interruptions					
Need to divert resources to core activities					
To facilitate Cluster arrangement and management					
Others (specify)					

**6.6** What are the challenges of outsourcing? (Tick one entry for each construct)

Challenges of outsourcing	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Loss of control/power					
Fall in employee morale					
Supply interruptions					
Poor quality of service					
Others (specify)					

**6.7** Has your firm invested in e-business logistics?

.....

.....

.....

**6.8** How do you maintain your local and international contacts?

.....

.....

.....

**7.0 OPERATIONAL ENVIRONMENT**

**7.1** The operational environment contributes to market access and competitiveness? (Tick one entry for each construct)

Impact of operational environment on market access and competitiveness	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Time management is crucial for international trade					
Political stability attracts investment					
Market size encourages investment expansion					
Stable macro-indicators are good for business					
Technical and market stands stabilise international trade					
Family based manufacturing businesses underpin international trade					
Functioning infrastructure sustains trade and investment					
Attracts diverse participants (MNC, TNC, Born global, SMEs) to locate in the country					

Private sector involvement guarantees economic development					
Others (specify)					

**7.2** What in your view is the most critical element in the business environment?

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

**7.3** What role has technology played in the business environment?

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

**7.4** In your view, what operational environmental issues are critical for your line of business?

Critical elements of operational environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Security					
Governance and Corruption					
Functional judicial system					
Stable fiscal and macroeconomic Framework					
Functional Transport infrastructure and logistics					
Access to affordable energy					
Access to ICT networks					
Performing institutions in both public and private sector					
private sector partnerships with foreign investors					
Access to air and sea transport					
E-commerce and e-business					
Corporate governance					
Political stability					
Business culture and ethics					
Others (specify)					

**7.5** What in your view are the most critical issues in a business environment?

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



**7.6** What should government do to improve the business environment?

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

**8.0 STRATEGIC VISION**

This section will assist you assess and identify areas that will assist your business expansion into the global market. This is a form of analysing the Strength, Weaknesses, Opportunities and Threats of your business.

**8.1 Readiness Assessment to go global**

- 1) Does your firm have a strategy?      Yes       No
- 2) Where would you like to see your business 5 or 10 years from now?
- i. In 5 years
  - ii. In 10 years
- 3) How do you envisage getting there?
- 4) What do you need to focus on in order to achieve this goal?
- 5) a. What are your firm's strengths which currently propel you towards your goals?
- .....
- b. Who do you need to work with to achieve your goals?
- .....
- c. What is the best way to engage this party?
- .....

## 8.2 Competency - core competencies

1. What are you not doing well?
2. Where are the weak points of the chain?
3. In which areas do you think you need to improve?  
(Tick one entry for each construct)

Construct	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Logistics					
Product quality					
Production or processing					
Efficiencies,					
Specialized product qualities					

4. i) Where are most resources concentrated? (state)
  - i) Does this correspond with your most value adding process competency?  
(Tick one)  
 Yes                       No

5. a. Where are the limited resources? (State)  
 .....
- b. Where are the abundant resources? (State)  
 .....

6. What limits your growth? (State)  
 .....

7. i) What do you wish you had more of? (State)  
 .....

ii) What do you wish you had less of? (State)

.....

8. i) Are there logistical problems in your firm operations?

<b>Construct</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
Supply logistics					
Transportation logistics					
Storage facilities					

ii) Where are they in the chain?

<b>Construct</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
Supply logistics					
Transportation logistics					
Storage facilities					

9. What information do you and your partners' need which could help you operate more efficiently? (State)

.....

10. What change(s) would provide your firm with the greatest benefits? (State)

.....

11. a. What relationships in the chain are the strongest?

.....

b. Which relationships could use more work?

.....

12. i) What would your consumers say are the product or service strengths? (State)

.....

ii) What would your consumers say are the product or service weaknesses? (State)

.....

iii) Are these reflected in your chain? (Tick one)

Yes  No

**8.3 Compatibility-** ability to engage in well-functioning business relationships.

1. Are business partnerships valued as part of your organization's high level strategy?

Yes  No

2. Does your firm have confidence in its existing partners?

Yes  No

3. Has your firm dedicated sufficient resources (financial, human, information, time etc.) for the building and maintenance of strategic business partnerships?

Yes  No

4. Is your firm comfortable sharing valuable market information or best practice with business partners?

Yes  No

**8.4 Questions to evaluate Is Selling Right for My Firm?**

a) Does your firm have the production capacity to serve both your domestic customers and your global value chain clients?

Yes  No

b) Is your production capacity easily adjusted in the case that either your domestic demand or demand from your global value chain partners increases?

Yes  No

c) Are product modifications required to make your product suitable for other corporate clients easily achieved?

Yes  No

d) Are the costs of adjustment manageable?

Yes  No

- e) Is your after-sales support service easily adaptable to accommodate foreign customers (i.e. language, culture, business environment, hours, etc.)?  
 Yes  No
- f) Do you have the logistical expertise to sell into a global value chain? Does your product's shelf life allow for sufficient transportation time?  
 Yes  No
- g) Are other firms in your sector using this method?  
 Yes  No
- h) Does your product meet necessary international technical or regulatory product standards?  
 Yes  No
- i) Are you able to meet the high performance standards expected by MNEs? Would you make investments in technology to win business?  
 Yes  No

### 8.5 Understanding the concept of global value chain (GVC):

The new economic order of globalization has given rise to a paradigm shift in global business environment. Enterprises now split their production processes into a number of business functions which they off-shore to gain efficiency and/or competitiveness in new markets. In your opinion which of the following definitions best describes the GVC concepts that corresponds to your understanding of this concept. (Tick one entry for each construct)

Construct	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
GVC is predominantly MNC/TNC business arrangements in international trade					
GVC is the form of management practice of international trade for the developed country companies					
GVC is the form of international trade for modern technology products					
GVC are for distribution of sales/exports or purchases of inputs and outputs					
Other (specify)					

### Appendix 3: Questionnaire to the Public sector and related Parastatals

The questionnaire is designed to gather information on “*Determinants of Competitiveness of Electrical and Electronic Manufacturing Enterprises in Kenya.*” The electrical and electronics industry includes companies that design, produce, service, install and distribute products & systems consisting of electrical and electronic products and components, consumer and industrial products and which may contain embedded or loaded software to provide an operational device or network. This questionnaire is to be completed by the public sector senior management, preferably, the CEO or the senior technical officer. Please complete each question by ticking against the appropriate box reflecting the pertaining situation or by giving your opinion as truthfully as possible in the open ended questions. Your response will be completely anonymous and will be used by the researcher for the purpose of this study only. All the information in this questionnaire is CONFIDENTIAL. The contacts so provided shall only assist in making follow up.

#### 1.0 Background information

Please provide the following identification information.

<b>Name of firm</b>	
<b>Address</b>	
<b>Tel</b>	
<b>Email</b>	
<b>Website</b>	
<b>Number of employees</b>	
<b>Name and contacts of officer completing the questionnaire</b>	Name:
	Office Tel:
	Mobile:
	Email:
<b>Date</b>	

1.1 In which of the following sectors does your organisation fall in on basis of your core functions (Tick)

<b>Core functions</b>	<b>Tick</b>
Policy making	
Technical support	
Regulation/enforcement	
Coordinator	
Disseminating new information on businesses	

## 2.0 COMPETITIVENESS

2.1 What is your organisation's Policy Stand on Partnerships in electrical and electronic manufacturing sectors (Tick one entry for each construct).

Policy Stand on Partnerships	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Private sector is free to manage its business in a liberalized market					
PPPs provide guidance					
Public sector provides framework through specific agreements					
Public sector initiates forums for local and foreign private sector interactions					
Others (specify)					

2.2 What role does your organisation play in sensitising the private sector of the shifts in global business environment?

Role of sensitisation of shifts in business environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Policy analysis					
Business trend analysis					
Negotiating agreements that safeguard the interests of the private sector					
Respond to requests from private sector					

**2.3 Understanding the concept of global value chain (GVC)**

The new economic order of globalization has given rise to a paradigm shift in global business environment. Enterprises now split their production processes into a number of business functions which they off-shore to gain efficiency and/or competitiveness in new markets. In your opinion which of the following GVC concepts best correspond to your understanding of this concept. (Tick one entry for each construct).

Concepts of GVC	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
GVC is predominantly MNC/TNC business arrangements in international trade					
GVC is the form of management practice of international trade for the developed country companies					
GVC is the form of international trade for modern technology products					
GVC are for distribution of sales/exports or purchases of inputs and outputs					
Other (specify)					

**2.4** Do you think Kenyan manufacturing industry is ready to participate in the global value chains where multinational outsource part of their production segments?

.....

.....

.....

**2.5** Do you think the Kenyan electrical and electronic manufacturing sector is ready to participate in the global value chains?

.....

.....

.....

**2.6** What additional interventions can government undertake for the manufacturing sector to participate in the global value chains?

.....

.....

.....



### 3.0 REGULATIONS

3.1 Kenya has liberalised all sectors of its economy. Please rate the following regulations on basis of the impact they have on businesses? (Tick one entry for each construct)

Impact of regulations on business performance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Trade and Investment regional/international agreements have created opportunities for private sector					
Deregulation has resulted in lower consumer prices making local products uncompetitive					
Stability of Macroeconomic and fiscal policies have intensified competition from increased consumer varieties					
Standardization of rules and procedures (laws) has improved competition					
Standardisation processes benchmarked to international best practice provide motivation to investors					
Market Access to EU Market is for agricultural products					
Incentive schemes are selective targeting foreign investors					
Anti -Corruption laws are working					
Counterfeit regulations work in a market economy					
Anti-dumping laws have impact at firm level					
Private property rights systems have encouraged foreign investors					
Consumer protection rights facilitate customer access to cheap products					
International commitments on Labour policies have stabilised labour costs					
International commitments on environment protection laws have improved product safety					
International requirements on recycling work in Kenya					

<b>Impact of regulations on business performance</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
Private sector self-governance rules have improved competition					
Others (Specify)					

**3.2** What are some of the key policy and regulatory frameworks that businesses have raised concerns, that you feel require urgent government action.

(Tick one entry for each construct).

<b>Policy and regulatory frameworks requiring government intervention</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
International labour and environment laws					
Labour policies on minimum wage productivity					
Productivity based wage guidelines					
Worker unions policy					
Public sector Capacity to enforce laws and regulations					
Institutional structures for policy implementation					
Competition from lower import tariffs					
Meeting Changing customer tastes					
Capacity to meet technical market requirement					
Management of trade barriers					
Competition from Chinese and Asian imports					
Other (specify)					

**3.3** What are some of your views on globalisation?

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

**3.4** Has it created or reduced opportunities for Kenya? ..... And in which ways?

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

#### 4.0 TECHNOLOGY

Technology is a key determinant on productivity and associated competitiveness in businesses

4.1 In your view which are the most critical issues with regard to technology that the electrical and electronics sector should prioritise?

(Tick one entry for each construct).

Critical issues in technology adoption	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Investing in specialised modern technology					
Going into partnership with better endowed partners					
Investing in a flexible business strategy in order to cope with the changing consumer demands					
Adopting contemporary fragmented production systems governing competitiveness					
Investing in modern distribution systems					
Undertaking continuous staff development in order to cope with changing market requirements					
Investing in new products dominating the global markets					
Going into partnerships that can introduce new technology in the manufacturing sectors					
Modernizing communication and information and systems					
Others (Specify)					

4.2 Do you think Kenya is ready to be part of the global networked production chains?

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

**4.3** What do you think is preventing Kenyan companies from participating in Partnerships?

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

**4.4** How can this situation be changed?

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

**5.0 INNOVATION**

**5.1** In your view which of the following contribute to innovation?  
 (Tick as appropriate)

<b>Construct:</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
Knowledge sharing and learning					
R&D for continuous renewal					
E-business platforms					
IT facilitated Communication networks for coordination and collaboration					
IT assisted management systems					
Value Addition					
Development of human capital to bring new ideas					
Branding					
Others (specify)					

**5.2** Is research necessary for the country's continued competitiveness in the market?

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

**5.3** What proportion of your organisations budget is spent on research?

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

**6.0 MARKET ACCESS**

**6.1** What from your organisations point of view contributes to effective market access?

(Tick one entry for each construct)

Key contributors to market access	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information access and network					
Operational, bilateral, regional and international agreements					
Quality products					
Support institutions					
Strong private sector					
Effective Public and private sector partnerships					
Others (specify)					

- (a) What are some of the latest contributions has your organisation made in enhancing market access for Kenyan originating products and services?
- (b) What are the greatest challenges to the Kenyan business community in today's business environment?
- (c) What can your organisation do to reduce these challenges?

**6.2 Logistics**

(a) Does your firm have any integration with external logistics with suppliers/distributors? (Tick one)

Yes

No

(b) Does your firm outsource any of its activities? (Tick one)

Yes  No

(c) Do you have a logistics department? (Tick one)

Yes  No

(d) What are your organisations views on the following aspects of logistics as part of strategic management in your firm?  
(Tick one entry for each construct)

Construct	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information sharing and network with key stakeholders					
Maintaining a website					
Subscribing to international data bases					
Coordination and collaboration among stakeholders in different clusters					
Facilitating implementation of agreements					
Monitoring trends					
Others (specify)					

(e) What logistical changes have taken place in the last 5 years?  
(Tick one option for each construct)

Changes in logistics in last 5-years	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information network with key stakeholders					
Maintaining a website					
Subscribing to international data bases					
Joint development of logistics among different stakeholder					
Internet based Information sharing					
On line Business transactions					
Others (specify)					

(f) What challenges have you encountered in business logistics?

(Tick one for each construct)

Logistics challenges	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Poor internet connectivity (slow, lacking)					
Impact of differences in time zones					
Servicing orders timely					
Information networks to facilitate information sharing with buyers and suppliers					
Maintaining an interactive website					
Subscribing to international data bases					
Others (specify)					

(g) In your opinion, what should be done on priority basis to address these challenges?

Proposals for strengthening business logistics	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Capacity building					
Government facilitation in identifying external partners and building the logistic networks					
Maintenance of databases along the same international requirements by both public sector agencies and private sector organisations					
Others (specify)					

### 6.3 Outsourcing

(a) Does your organisation outsource some of its activities? (Tick one)

Yes  No

(b) When did your organisation initiate outsourced activities?

(State year) .....

(c) Why has your organisation opted to outsource some of its activities?

Reasons for outsourcing	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Pressure to reduce costs					
To tap into new technology					
Pressure to meet customer satisfaction					
Responding to liberalisation					
Reduce work force					
Need to divert resources to core activities					
To facilitate coordination and collaboration					
Others (specify)					

(d) What do you see as weaknesses to outsourcing? (Tick one for each construct)

Challenges of outsourcing	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Loss of control/power					
Fall in employee morale					
Supply interruptions					
Poor quality of service					
Others (specify)					

**6.4** Has your organisation invested in e-business logistics?

.....

.....

.....

**6.5** How do you maintain your local and international contacts?

.....

.....

.....



## 7.0 OPERATIONAL ENVIRONMENT

7.1 In your view, what operational environmental issues are critical for your line of business? (Tick one entry for each construct).

Critical elements of operational environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Security					
Governance and Corruption					
Functional judicial system					
Stable fiscal and macroeconomic Framework					
Functional Transport infrastructure and logistics					
Access to affordable energy					
Access to ICT networks					
Performing institutions in both public and private sector					
Private sector partnerships with foreign investors					
Access to air and sea transport					
E-commerce and e-business					
Corporate governance					
Political stability					
Business culture and ethics					
Others (specify)					

7.2 The operational environment contributes to market access and competitiveness? (Tick one entry for each construct)

Impact of operational environment on market access and competitiveness	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Time management is crucial for international trade					
Political stability attracts investment					
Market size encourages investment expansion					
Stable macro-indicators are good for business					
Technical and market stands stabilise international trade					
Family based manufacturing businesses underpin international trade					

Impact of operational environment on market access and competitiveness	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Functioning infrastructure sustains trade and investment					
Attracts diverse participants (MNC, TNC, Born global, SMEs) to locate in the country					
Private sector involvement guarantees economic development					
Others (specify)					

**7.3** What in your view are the most critical issues in a business environment?

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

**7.4** What should government do to improve the business environment?

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

**7.5** What in your view is the most critical element in the business environment?

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

**7.6** What role has technology played in the business environment?

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

## Appendix 4: Questionnaire to the Private Sector Associations Instructions

The questionnaire is designed to gather information on “*Determinants of Competitiveness of Electrical and Electronic Manufacturing Enterprises in Kenya*”. The electrical and electronics industry includes companies that design, produce, service, install and distribute products & systems consisting of electrical and electronic products and components, consumer and industrial products and which may contain embedded or loaded software to provide an operational device or network. This questionnaire is to be completed by the private sector associations’ senior management, preferably, the CEO or the operations manager. Please complete each question by ticking the appropriate response reflecting the pertaining situation or by giving your opinion as truthfully as possible. Your response will be completely anonymous and will be used by the researcher for the purpose of this study only. All the information in this questionnaire is CONFIDENTIAL. The contacts so provided shall only assist in making follow up.

### 1.0 Background information

Please provide the following identification information.

<b>Name of firm</b>	
<b>Address</b>	
<b>Tel</b>	
<b>Email</b>	
<b>Website</b>	
<b>Number of employees</b>	
<b>When was organisation set up</b>	
<b>Name and contacts of officer completing the questionnaire</b>	Name:
	Office Tel:
	Mobile:
	Email:
<b>Date completed questionnaire</b>	

1.1 In which of the following sectors does your organisation fall in on basis of your core functions? (Tick)

<b>Policy making</b>	
<b>Technical support</b>	
<b>Regulation/enforcement</b>	
<b>Coordinator</b>	
<b>Disseminating new information on businesses</b>	

## 2.0 COMPETITIVENESS

### 2.1 What is your organisation's Policy Stand on Partnerships in electrical and electronic manufacturing sectors (Tick one entry for each construct).

Policy Stand on Partnerships	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Private sector is free to manage its business in a liberalized market					
PPPs provide guidance					
Public sector provides framework through specific agreements					
Public sector initiates forums for local and foreign private sector interactions					
Others (specify)					

### 2.2 What role does your organisation play in sensitising the private sector of the shifts in global business environment?

Role of sensitisation of shifts in business environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Policy analysis					
Business trend analysis					
Negotiating agreements that safeguard the interests of the private sector					
Respond to requests from private sector					

**2.3 Understanding the concept of global value chain (GVC)**

The new economic order of globalization has given rise to a paradigm shift in global business environment. Enterprises now split their production processes into a number of business functions which they off-shore to gain efficiency and/or competitiveness in new markets. In your opinion which of the following GVC concepts best correspond to your understanding of this concept. (Tick one entry for each construct).

Construct	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
GVC is predominantly MNC/TNC business arrangements in international trade					
GVC is the form of management practice of international trade for the developed country companies					
GVC is the form of international trade for modern technology products					
GVC are for distribution of sales/exports or purchases of inputs and outputs					
Other (specify)					

**2.4** Do you think Kenyan manufacturing industry is ready to participate in the global value chains where multinational outsource part of their production segments?

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

**2.5** Do you think the Kenyan electrical and electronic manufacturing sector is ready to participate in the global value chains?

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

**2.6** What additional interventions can government undertake for the manufacturing sector to participate in the global value chains?

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

**2.7** Please specify the type of Partnerships you would advise your members to engage in for production and sales: Specify source/destination countries

Partnership system	Production			Sales		
	Local	Regional	Inter-national	Local	Regional	Inter-national
Contracts						
Outsourcing						
Agency						
Vertical						
Other (specify)						

**2.8 Why would you advocate for that type of partnership?**

(Tick one entry for each construct)

Construct	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
To take advantage of preferential market access in region and international agreements					
To avoid stringent market requirements in the international export markets					
To service existing contracts					
To take advantage of change in consumer tastes					
To fill gaps due to shocks or destabilization of substitutes					
To cope with lost market share due to contraband and counterfeits					
To cope with competition					
Higher demand due to lower prices					
To leverage technology and innovations from partners					
Due to capacity constraints					
Others (specify)					

**2.9** Do you think Kenyan manufacturing industry is ready to participate in the global value chains where multinational outsource part of their production segments?

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

**2.10** Do you think the Kenyan electrical and electronic manufacturing sector is ready to participate in the global value chains?

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

**2.11** What additional interventions are required for Kenyan manufacturing sector to participate in the global value chains?

.....  
 .....

**3.0 REGULATIONS**

**3.1** Kenya has liberalised all sectors of its economy. Please rate the following regulations on basis of the impact they have on businesses?

(Tick one entry for each construct)

Impact of regulations on business performance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Trade and Investment regional/international agreements have created opportunities for private sector					
Deregulation has resulted in lower consumer prices making local products uncompetitive					
Stability of Macroeconomic and fiscal policies have intensified competition from increased consumer varieties					
Standardization of rules and procedures (laws) has improved competition					
Standardisation processes benchmarked to international best practice provide motivation to investors					
Market Access to EU Market is for agricultural products					
Incentive schemes are selective targeting foreign investors					
Anti -Corruption laws are working					
Counterfeit regulations work in a market economy					
Anti-dumping laws have impact at firm level					
Private property rights systems have encouraged foreign investors					
Consumer protection rights facilitate customer access to cheap products					
International commitments on Labour policies have stabilised labour costs					
International commitments on environment protection laws have improved product safety					
International requirements on recycling work in Kenya					

<b>Impact of regulations on business performance</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
Private sector self-governance rules have improved competition					
Others (Specify)					

**3.2** What are some of the key policy and regulatory frameworks that you feel require urgent government action. (Tick one entry for each construct).

<b>Policy and regulatory frameworks requiring government intervention</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
International labour and environment laws					
Labour policies on minimum wage productivity					
Productivity based wage guidelines					
Worker unions policy					
Public sector Capacity to enforce laws and regulations					
Institutional structures for policy implementation					
Competition from lower import tariffs					
Meeting Changing customer tastes					
Capacity to meet technical market requirement					
Management of trade barriers					
Competition from Chinese and Asian imports					
Other (specify)					

**3.3** What are some of your views on globalisation?

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

**3.4** Has it created or reduced opportunities for Kenya? .....And in which ways?

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



#### 4.0 TECHNOLOGY

Technology is a key determinant on productivity and associated competitiveness in businesses.

**4.1** In your view which are the most critical issues with regard to technology adoption in the electrical and electronics sector that should be prioritized in the current business environment?

(Tick one entry for each construct).

Critical issues in technology adoption	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Investing in specialised modern technology					
Going into partnership with better endowed partners that can introduce new technology in the manufacturing sectors					
Investing in a flexible business strategy in order to cope with the changing consumer demands					
Adopting contemporary fragmented production systems governing competitiveness					
Investing in modern distribution systems					
Undertaking continuous staff development in order to cope with changing market requirements					
Investing in new products dominating the global markets					
Modernizing communication and information and systems					
Others (Specify)					

**4.2** Does your organisation participating in any partnership?

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

**4.3** Are your members ready for local or foreign Partnerships?

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

**4.4** What would be the key driving factor for your organisation to enter into a partnership?

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

**5.0 INNOVATION**

**5.1** Does your organisation promote any innovation activities among its members?  
 Yes / No .....

**5.2** In your view which of the following contribute to innovation?  
 (Tick one entry for each construct)

Construct:	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Knowledge sharing and learning					
R&D for continuous renewal					
E-business platforms					
IT facilitated Communication networks for coordination and collaboration					
IT assisted management systems					
Value Addition					
Development of human capital to bring new ideas					
Branding					
Others (specify)					

**5.3** Is research necessary for the members of your associations continued competitiveness in the market?

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

**5.4** What proportion of their sales revenue is spent on research?

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

## 6.0 MARKET ACCESS

### 6.1 What from your organisations point of view contributes to effective market access? (Tick one entry for each construct)

Key contributors to market access	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information access and network					
Operational, bilateral, regional and international agreements					
Quality products					
Support institutions					
Strong private sector					
Effective Public and private sector partnerships					
Others (specify)					

#### (a) What in your view is the most critical element in the business environment?

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

#### (b) What role has technology played in the business environment?

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

## 6.2 Logistics

### (a) Does your firm have any integration with external logistics with suppliers/distributors? (Tick one)

Yes  No

### (b) Does your firm outsource any of its activities? (Tick one)

Yes  No

### (c) Do you have a logistics department? (Tick one)

Yes  No

(c) What are your organizations views on the following aspects of logistics as part of strategic management in your firm (Tick one entry for each construct)

Construct	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information sharing and network with key stakeholders					
Maintaining a website					
Subscribing to international data bases					
Coordination and collaboration among stakeholders in different clusters					
Facilitating implementation of agreements					
Monitoring trends					
Others (specify)					

(e) Why does your firm undertake these type of logistics?  
(Tick one entry for each construct)

Construct	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Monitor Competition					
Sustain Market access					
Inform members on new development on timely basis					
Membership outreach					
Sustain partnerships					
Other (specify)					

(f) What logistical changes have taken place in the last 5 years?  
(Tick one option for each construct)

Changes in logistics in last 5-years	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Information network with key members					
Maintaining a website					
Subscribing to international data bases					
Joint development of logistics among different stakeholder					
Internet based Information sharing					
On line Business transactions					
Others (specify)					

- (g) What challenges have you encountered in business logistics?  
(Tick one for each construct)

Logistics challenges	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Poor internet connectivity (slow, lacking)					
Impact of differences in time zones					
Servicing orders timely					
Information networks to facilitate information sharing with buyers and suppliers					
Maintaining an interactive website					
Subscribing to international data bases					
Others (specify)					

- (h) In your opinion, what should be done on priority basis to address these challenges?

Proposals for strengthening business logistics	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Capacity building					
Government facilitation in identifying external partners and building the logistic networks					
Maintenance of databases along the same international requirements by both public sector agencies and private sector organisations					
Others (specify)					

### 6.3 Outsourcing

- (a) Does your firm outsource some of its activities? (Tick one)

Yes  No

- (b) When did your company initiate outsourced activities?  
(State year).....

(c) Why has your organisation opted to outsource some of its activities?

Reasons for outsourcing	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Pressure to reduce costs					
To tap into new technology					
Pressure to meet customer satisfaction					
Responding to liberalisation					
Reduce work force					
Need to divert resources to core activities					
To facilitate coordination and collaboration					
Others (specify)					

(d) What do you see as weaknesses to outsourcing? (Tick one for each construct)

Challenges of outsourcing	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Loss of control/power					
Fall in employee morale					
Supply interruptions					
Poor quality of service					
Others (specify)					

(e) Has your organisation invested in e-business logistics?

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

(f) How do you maintain your local and international contacts?

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

(g) Has the membership of your association invested in e-business logistics?

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

(h) How does your association maintain its local and international contacts?

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

**7.0 OPERATIONAL ENVIRONMENT**

**7.1** In your view, what operational environmental issues are critical for your line of business?

(Tick one entry for each construct).

Critical elements of operational environment	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Security					
Governance and Corruption					
Functional judicial system					
Stable fiscal and macroeconomic Framework					
Functional Transport infrastructure and logistics					
Access to affordable energy					
Access to ICT networks					
Performing institutions in both public and private sector					
Private sector partnerships with foreign investors					
Access to air and sea transport					
E-commerce and e-business					
Corporate governance					
Political stability					
Business culture and ethics					
Others (specify)					

**7.2 The operational environment** contributes to market access and competitiveness?

(Tick one entry for each construct)

Impact of operational environment on market access and competitiveness	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Time management is crucial for international trade					
Political stability attracts investment					
Market size encourages investment expansion					
Stable macro-indicators are good for business					
Technical and market stands stabilise international trade					
Family based manufacturing businesses underpin international trade					
Functioning infrastructure sustains trade and investment					
Attracts diverse participants (MNC, TNC, Born global, SMEs) to locate in the country					
Private sector involvement guarantees economic development					
Others (specify)					

**7.3** What in your view are the most critical issues in a business environment?

.....

.....

.....

**7.4** What should government do to improve the business environment?

.....

.....

.....



## Appendix 5: Empirical Evidence on Electrical and electronic Competitiveness

Author, Year, Source	Study	Findings	Critique
Moses N. Kiggundu; Aareni Uruthirapathy: Competitiveness Review: An International Business Journal incorporating Journal of Global Competitiveness, Vol 20:4, 2010: pp 288-304	Canada's global and business competitiveness: competition policy reform in a changing world: The focus of the study was on pillars are: institutions (both public and private), infrastructure, the macro economy, health and basic education, higher education and skills training, market efficiency, technical readiness, business sophistication and innovation. The GCI calculations are based on the idea that different pillars affect different countries differently depending on their stages of development	Canada requires a national strategy to create a generation of Canadian innovators, entrepreneurs and executives with a global mind-set.  Lack of a national global competitiveness strategy	Study is based on 4 trading partners and yet Canada trades with many more global players  Analysis is based on GCRs and yet there could be national data that is peculiar to Canada
Henisz, W. (2002), <i>Industrial and Corporate Change</i> , Vol. 11 No.2, pp.355-89.	"The institutional environment for infrastructure investment",	Structure of political institutions plays a vital role in attracting investment in infrastructure which is consistent with the competitiveness framework advanced by the World Economic Forum ( <i>Global Competitiveness Report, 2001-2002</i> )	
A.N.M. Waheeduzzaman. Competitiveness Review: An International Business Journal incorporating Journal of Global Competitiveness, 2011 Vol. 21 Iss: 2, pp.110 – 128	Competitiveness and convergence in G7 and emerging markets". The purpose of this paper is to explore the competitiveness and convergence of the G7 and big emerging markets (BEM) nations using various economic, demographic, trade, investment, and freedom and governance criteria.	The findings show that BEM is growing faster than G7 in most economic indicators including GDP, trade, and investment. The growth results in some form of convergence. The freedom and governance infrastructure of the BEM is relatively weak to support their economic growth. The primary challenge of the BEM is coming from the	Comparisons are delineated among few western and Asian economies

Author, Year, Source	Study	Findings	Critique
	<p>The two groups of nations, G7 and BEM, are compared on the basis of various longitudinal and cross-sectional variables. The longitudinal variables are GDP and real GDP growth, per capita GDP, international trade, foreign direct investment, index of ageing and life expectancy at birth. Cross-sectional competitive indices are Global competitiveness index, index of economic freedom, Democracy index, Human development index, Gini index, Government effectiveness, and Corruption perception index.</p>	<p>economic interdependence they create in a globalized economy. Overall, the growth presents a new political reality that the world must recognize.</p> <p>National competitiveness is a long-term issue. A 30-year longitudinal analysis may not be long enough to accurately reflect a nation's performance. Evidently, wealth creation in the emerging markets has profound influence in noneconomic areas.</p> <p>Political polarization and military confrontation are not unlikely</p> <p>Demonstrates the increasing global economic interdependence and guard against the negative effects of emerging markets' growth.</p>	
<p>Ruth Rios-Morales, Louis Brennan. JEL classification – F21, F23, F29</p>	<p><i>The emergence of Chinese investment in Europe.</i> The paper analyses the new phenomenon of surging FDIs of emerging countries in the context of the Eclectic Paradigm. It focuses on Chinese investment in Europe with a particular consideration given to the manufacturing sector.</p>	<p>Governments play a critical role in influencing FDI flows</p>	<p>The study does not disclose that the bulk of Chinese FDIs are tagged on resources in recipient developing countries</p>
<p>Ruth Rios-Morales, Louis Brennan. Euro-Med Journal of Business, Vol5:2, 2010 pp: 215-231</p>	<p>The emergence of Chinese investment in Europe. To establish the reasons for the emerging countries surging contributors of outward foreign direct investment (FDI) in both developing and developed markets around the world.</p>	<p>Increase in FDIs in line with Eclectic paradigm and exigencies of politics and closing up of distance</p> <p>Support of exports, the expansion of market presence, the acquisition of</p>	<p>Inadequate disclosure of information to assist other countries follow the same patterns</p>

Author, Year, Source	Study	Findings	Critique
		<p>foreign skills, improvement of quality products, exploitation of own advantages on markets abroad and the establishment of local distribution networks (Rios-Morales and Brennan, 2006; Buckley <i>et al.</i>, 2008; Söderman <i>et al.</i>, 2008)</p> <p>-Building international brands, accessing advanced technologies and establishing R&amp;D centres in developed countries help to explain the rise of Chinese FDI (Aguilar <i>et al.</i>, 2009)</p> <p>-Increasing financial strength and the growing exposure of Chinese companies to international business has been suggested as explanation</p> <p>-Increased domestic competition and as in the case of the bicycle industry, the need to relocate mature industries to lower wage sites are also counted as factors</p> <p>-Emergence of a new generation of ambitious and often well-educated entrepreneurs has also been a contributing factor (Dunning, 2006b).</p> <p>-Chinese companies are well represented in home appliances and consumer electronics. China's computer industry is growing stronger in the</p>	

Author, Year, Source	Study	Findings	Critique
		<p>developed world-FDI into Europe are concentrated in the services sectors</p> <p>-Chinese companies compete on low cost differentiation (low labour costs)</p>	
<p>Julius J. Okello<sup>1</sup> and Lydia K. Ndirangu, 2010. Paper prepared for presentation at the 3rd African Association of Agricultural Economics, AAEA/AEASA Conference, Cape Town, South Africa, 19-23 September, 2010</p>	<p>Does the environment in which ICT-based market information services (MIS) projects operate affect their performance? Experiences from Kenya.</p>	<p>ICT facilitated systems reduces transaction costs, improve efficiency of markets.</p> <p>ICT systems held in management of business contracting</p> <p>Legal and political environment play a role in</p> <p>Culture has an impact on operational environment, since others try to avoid repaying loans.</p>	<p>Agree. However, use of technology and access are limited</p>

## Appendix 6: Competitive Policy Theories

Author, Year, Source	Theory/Business Model/Strategies	Critique
WTO/GATT	Open market economies characterized by free trade	<p>Weak private sector and institutions</p> <p>Political based decisions- e.g. boycotts of trading with nations on political grounds –Arabs not trading with state of Israel</p> <p>Differences in accounting methods may impact on profitability and competitiveness of nations</p> <p>Ethical values differ across nations- as reflected in CSR and management of country risks</p>
		<p>Protectionism-thru use of tariffs, NTBs, quotas, promotion thru incentives, infant industry.... For revenue, special interests, security, culture, local content,</p>
<p>Mark Thornton (2011). The Mystery of Adam Smith's Invisible Hand Resolved (<a href="http://mises.org/journal/scholar/Thornton/12.pdf">http://mises.org/journal/scholar/Thornton/12.pdf</a>) Download-31<sup>st</sup> August 2011.</p>	<p><i>An Inquiry into the Nature and Causes of the Wealth of Nations</i> (Smith, Adam. (1976 [1776]), New York, NY: Oxford University Press). The role of the invisible hand in price theory, competition, and distribution (broken down into wages, rents and profit-inequality since masters/owners of land retained all the wealth).</p>	<p>Disagree with inequality complaint since rents are paid to a factor of production different from profit. The fact that the rents and profits are paid to one and the same person does not amount to double payment</p>
<p>John Maynard Keynes (1936)</p>	<p><i>The General Theory of Employment, Interest, and Money</i>. Father of macro-economics. Neoclassical economics that held that free markets would in the short to medium term automatically provide full employment, as long as workers were flexible in their wage demands. Keynes instead argued that aggregate demand determines the overall level of economic activity, and that inadequate aggregate demand could lead to prolonged periods of high unemployment.</p>	<p>Does not take into account the need for regulation that can ensure markets work efficiently. The challenges experiences in the immediate past include the financial crisis of 2008, in which the absence of regulations undermined the operations of the free market.</p>
<p>Jeane-Baptise Say (1803). Translated by Clement C. Biddle,</p>	<p>A Treatise on Political Economy; or the Production, Distribution, and Consumption</p>	<p>What is produced may not be required by consumers</p>

Author, Year, Source	Theory/Business Model/Strategies	Critique
LL. D (2001). Batoche Books. Kitchener, Ontario, Canada	of Wealth- Supply creates its own demand. Products are paid for by other products.	
David Ricardo (1817)	<i>Principles of Political Economy and Taxation.</i> - famous treatise lays the groundwork for the principles of the market economy. It established the guiding ideas behind the economic concepts of diminishing returns and economic rent. As a leading master of economic principles of his time, Ricardo developed the theories now identified as distribution theory and international trade theory, or comparative advantage. He also wrote labour theories.	Agree since this arrangement held during his time
<b>Craig R Warden.</b> <i>International Journal of Health Geographics</i> 2008, 7:51 doi:10.1186/1476-072X-7-51	<i>Comparison of Poisson and Bernoulli spatial cluster analyses of paediatric injuries in a fire district.</i> With limited resources available, injury prevention efforts need to be targeted both geographically and to specific populations. The Bernoulli method allows more focused cluster mapping and evaluation since it directly uses location data. Once clusters are found, interventions can be targeted to specific geographic locations, location types, ages of victims, and mechanisms of injury.	Agree

## Appendix 7: Empirical Evidence of Policy Impact on Electrical and electronic Competitiveness

Author, Year, Source	Study	Findings	Critique
Eusuf, 2006	Competition Policy and Consumer rights: Bangladesh Scenario. Lack of Competition policy -Restrictive and Monopoly control Practises though available is not implemented	Many natural monopolies in operation making the restrictive practices impractical to implement -price fixing is predominant -weak regulatory environment -consumers are at the mercy of the business community	These problems of natural monopolies and lack of competition even in the sectors that have been liberalized makes it difficult for consumers to benefit from liberalisation
Barbara E. McDade And Anita Spring. Entrepreneurship & Regional Development, 17, January (2005), 17-42	The 'new generation of African entrepreneurs': networking to change the climate for business and private sector-led development	A new generation of entrepreneurs of business globalists, using network systems for business transactions. The study analyses interview data from 57 men and women network members from 10 countries (Botswana, Ethiopia, Ghana, Kenya, Mali, Senegal, South Africa, Uganda, Zambia and Zimbabwe). These businesses are in addition to SMEs. Only 2% of all African businesses have 10 or more employees (Spring and McDade 1998, Manu 1999).	While agree limitation lie with infrastructure and knowledge on use of ICT

## Appendix 8: Technology Theories on Competitiveness

Author, Year, Source	Theory/Business Model/Strategies	Critique
Lotour (1997), On Actor Network Theory: a few clarifications.	Actor-Network-Theory-positis a heterogeneous network of humans and non-humans as equal interrelated actors. Key concepts include the inscription of beliefs, practices, relations into technology, which is then said to embody them	Disagree. None humans cannot communicate
<p>Callon (1999). Some Elements of Sociology of Translation: Domestication of the Scallops and the Fishermen of Saint Brieuc Bay.</p> <p>Pinch, T. and Bijker, W. (1992). The social construction of facts and artefacts: or how the sociology of science and the sociology of technology might benefit each other. Shaping Technology/Building Society, pages 17–50. MIT Press, Cambridge, MA.</p> <p>In Biagioli, M., editor, The Science Studies Reader, pages 67–83. Routledge, New York</p>	<p>Social construction of Technology Theory- argues that human action shapes technology. Key concepts include:</p> <p>Interpretive flexibility: flexibility in how people think of or interpret artefacts and how they are designed. Thus Technological artefacts are culturally constructed and interpreted.</p> <p>relevant social group: shares a particular set of meanings about an artefact</p> <p>closure and stabilization: when the relevant social group has reached a consensus wider context: "the socio-cultural and political situation of a social group shapes its norms and values, which in turn influence the meaning given to an artefact</p>	Agree
DeSantis and Poole (1990), and Orlikowski (1992).	Structuration Theory- defines structures as rules and resources organized as properties of social systems. The theory employs a recursive notion of actions constrained and enabled by structures which are produced and reproduced by that action. Unlike the SCT, the structuration theory examines how people, as they interact with a technology in their on-going practices, enact structures which shape their emergent and situated use of that technology.	Values in Design - asks how do we ensure a place for values (alongside technical standards such as speed, efficiency, and reliability) as criteria by which we judge the quality and acceptability of information systems and new media. How do values such as privacy, autonomy, democracy, and social justice become integral to conception, design, and development, not merely retrofitted after completion? Key thinkers include <u>Nissenbaum</u> (2001).



Author, Year, Source	Theory/Business Model/Strategies	Critique
<p>Thomas P. Hughes (1992)</p> <p>Luhmann (2000). The reality of the mass media. Stanford, Stanford, CA.</p>	<p>Systems theory- considers the historical development of technology and media with an emphasis on inertia and heterogeneity, stressing the connections between the artefact being built and the social, economic, political and cultural factors surrounding it. Key concepts include reverse salient when elements of a system lag in development with respect to others, differentiation, operational closure, and auto-poetic autonomy.</p>	<p>Disagree. New technologies without any historical connections can spring up</p>
<p>Short, et al., 1976- The social psychology of telecommunications. John Wiley &amp; Sons, New York.</p>	<p>Social effects of communication media theory-</p> <p><i>Social presence theory</i>- social effects of communication technology of telephony and teleconferencing in which there is no physical contact</p>	<p>Disagree- new technology has made instant communication possible</p>
<p>Daft &amp; Lengel, (1986)- Organizational information requirements, media richness and structural design. Management Science, 32(5):554-571.</p>	<p><i>Media richness theory</i>- -medium of communication determines the level of detail to avoid ambiguity and uncertainty on account of its restrictiveness.</p>	<p>Disagree.</p>
<p>Kock, 2001- The ape that used email: Understanding e-communication behaviour through evolution theory. Communications of the Association for Information Systems, 5(3), 1-29.</p> <p>Koch, 2004- The psychobiological model: Towards a new theory of computer-mediated communication based on Darwinian evolution. Organization Science, 15(3), 327-348.</p>	<p><i>Media naturalness</i> posits the maintenance of historical face to face communication techniques</p>	<p>Disagree- will not be feasible for business</p>
<p>Postmes, Spears and Lea 1999;</p> <p>In W. Stroebe &amp; M. Hewstone (Eds.), European Review of Social Psychology (Vol. 6, pp. 161–198). Chichester: Spears &amp; Lea, 1994- Panacea or panopticon?</p>	<p><i>Social identity of dis-individuation Effects (SIDE)</i> - distinguishes cognitive and strategic effects of a communication technology- e.g. email may disclose social identity details; Social networks also provide more personal details Social identity, group norms, and de-individuation: Lessons from computer-mediated communication for social influence in the group. In N. Ellemers,</p>	<p>Ag ree</p>

Author, Year, Source	Theory/Business Model/Strategies	Critique
The hidden power in computer-mediated communication. <i>Communication Research</i> , 21, 427-459.	R. Spears, B. D., editor, <i>Social Identity: Context, Commitment, Content</i> . Blackwell, Oxford. Reicher, Spears and Postmes, 1995; A social identity model of de-individuation phenomena.	
McGrath, 1999. TIP;	Time, interaction, and performance (TIP) - work groups as time-based, multi-modal, and multi-functional social systems. Groups interact in one of the modes of inception, problem solving, conflict resolution, and execution. The three functions of a group are production (towards a goal), support (affective) and well-being (norms and roles).	Agree
Markus and Robey (1988) - Information technology and organizational change: causal structure in theory and research. <i>Management Science</i> , 34:583-598.	general technology theory consisting of the causal structures of agency (technological, organizational, imperative, emergent), its structure (variance, process), and the level (micro, macro) of analysis	Agree
Orlikowski (1992) - The duality of technology: rethinking the concept of technology in organizations. <i>Organization Science</i> , 3(3):398-427.	notes that previous conceptualizations of technology typically differ over scope (is technology more than hardware?) and role (is it an external objective force, the interpreted human action, or an impact moderated by humans?) and identifies three models:  technological imperative: focuses on organizational characteristics which can be measured and permits some level of contingency  strategic choice: focuses on how technology is influenced by the context and strategies of decision-makers and users  technology as a trigger of structural change: views technology as a social object	Agree
DeSanctis and Poole (1994)	technology's effects views wrt: decision-making: the view of engineers associated with positivist, rational, systems rationalization, and deterministic approaches  institutional school: technology is an opportunity for change, focuses on social evolution, social construction of meaning, interaction and historical processes, interpretive flexibility, and an interplay between technology and power	Agree

Author, Year, Source	Theory/Business Model/Strategies	Critique
	an integrated perspective (social technology): soft-line determinism, with joint social and technological optimization, structural symbolic interaction theory	
Bimber (1998) - Three faces of technological determinism. In Smith, M. and Marx, L., editors, Does Technology Drive History? The Dilemma of Technological Determinism, pages 79–100. MIT Press, Cambridge, MA.	addresses the determinacy of technology effects by distinguishing between the: normative: an autonomous approach where technology is an important influence on history only where societies attached cultural and political meaning to it (e.g., the industrialization of society) nomological: a naturalistic approach wherein an inevitable technological order arises based on laws of nature (e.g., steam mill had to follow the hand mill), <u>unintended consequences</u> : a fuzzy approach that is demonstrative that technology is contingent (e.g., a car is faster than a horse, but unbeknownst to its original creators become a significant source of pollution)	Agree

## Appendix 9: Empirical Evidence of effect of Technology on Electrical and electronic Competitiveness

Author, Year, Source	Study	Findings	Critique
<p>Gezinus J. Hidding, Jeff Williams, John J. Sviokla. Journal of Business Strategy Volume: 32 Issue: 2 2011</p>	<p><i>How platform leaders win.</i> To study successful strategies in platform industries, IT products that enable (a network of) users to communicate with each other, and that, consequently, exhibit network effects. Studied 15 platform industries, including their first-mover, early entrants and current leaders were studied. Historical records complemented the findings</p> <p>empirical</p>	<p>Unlike traditional products (e.g. consumer products), platforms evolve over time by technically integrating separate platforms (“embrace and extend”). Two key patterns were: follower advantage-prevalent in traditional industries and staircase strategies which applied to new series of industries. Complementary resources (i.e. resources the firm possesses outside of the product in question, for example R&amp;D skills or customer relations) did not explain why the current leaders won.</p> <p>First-mover advantage was largely illusionary and follower advantage prevalent.</p> <p>You don’t have to be the first mover in order to be a winner. Let other do the research and build on it</p>	<p>Study is not categorical in disqualifying key competences why some leaders win</p> <p>The sample is rather small to justify the generalities</p>
<p>Ajay, S.I. 2010. Washington, D.C.: International Monetary Fund</p>	<p><i>“Capital flight and external debt in Nigeria”.</i> In I. Ajay and M. Khan, eds., <i>External Debt and Capital Flight in Sub-Saharan Africa.</i> The determinants of FDI inflows into SSA</p>	<p>FDI critical for both growth and development via technology and skills transfer, leading to increased factor productivity and efficiency in resource utilisation, as has been the case for the Asian Tigers and China. However, policy framework underpins any benefits of FDI inflows.</p>	<p>Disagree. Perceptions affect FDI inflows</p>
<p>African Economic Research Consortium (AERC) (2005),</p>	<p><i>Determinants of Foreign Direct Investment in Africa,</i></p>	<p>Irrespective of African extensive reforms and adoption of conducive investment climate, FDI inflows are yet to be experienced. Infrastructure, justice and governance related issues as critical for FDI inflows.</p>	<p>Agree.</p>
<p>Elbadawi, and Mwega (1998)</p>	<p>Foreign Direct Investment in Kenya</p>	<p>using a macro-economic model, established that political and macro-economic instability, sour donor-government relations</p>	<p>Agree. Perceptions of the would-be donors play a big role. Besides, economies</p>

Author, Year, Source	Study	Findings	Critique
		impacted negatively on FDI inflows	tied to trading partners are equally influenced by the growth patterns of such countries
World Bank/KIPPRA (Blattman, 2004)	<i>Cost of Doing Business in Kenya</i>	Rated infrastructure, governance and skills critical in investor attraction. However, govt prioritisation focuses on the strategy applicable- e.g. Malaysia, Korea targeted FDI while	
Asiedu, E. 2002. World Development, 30(1): 107–19.	<i>“On the determinants of foreign direct investment to developing countries. Is Africa different?”</i>	There is more to attracting FDI than the traditional constructs of basic fundamentals, policy. Economy resistance to external shocks gives investors’ confidence	Agree
Korir, K 2006	Liberalisation in the Electricity sub-sector in Kenya Benefited the generation aspect, with entry of more participants, hence competition Stable and reliable power supply	Partial liberalization since transmission remained in monopoly power Continued high electricity bills to customers	Power tariffs have continued to increase
Julius J. Okello 1 and Lydia K. Ndirangu. Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa, September 19-23, 2010	Does the environment in which ICT-based market information services (MIS) Projects operate affect their performance? Experiences from Kenya	Illiteracy hampers take up ICT based service provision, distance to source centres	
John M. Kandiri (2011)	<i>ICT Policy in Kenya and Ways of improving the</i>	Prioritised strategies, stakeholder roles	Infrastructure was under developed

Author, Year, Source	Study	Findings	Critique
	<i>existing ICT Policy</i>		
African Partnership Forum, 2008. 10 <sup>th</sup> meeting of the African Forum; 70-8 April, 2008. Tokyo Japan	ICT in Africa: Boosting Economic Growth and Poverty Reduction.	<ul style="list-style-type: none"> <li>-ICT increases efficiency, boosts productivity</li> <li>-Africa's needs are diverse and require unique approaches rather than one-size fit all</li> <li>-success in adoption of mobile demonstrates that Africa is ready for change</li> <li>-prioritisation of creation of an enabling environment to create opportunities for access and use</li> </ul>	Promises without the appropriate infrastructure. ICT implementation is fragmented
Mureithi, Wanjira, 2008. E-Waste management Conference	E-Waste management in Kenya: Baseline Survey. Thru Lit. Review, field visits, the study mapped the flow of e-waste in Nairobi, to identify key roles of the different stakeholders with a view to putting together e-waste recovery and recycling processes. In this regard, the policy framework and legislative environment with attendant implications on socio-economic and environmental impacts formed the basis of the study.	<ul style="list-style-type: none"> <li>-10% each of PCs, monitors and printer discarded every year</li> <li>-low level of preparedness in public sector in management of e-waste</li> <li>-lack of capacity to deal with e-waste management</li> <li>- Min of Information had better policy understanding of implications of e-waste</li> <li>- consumers had no understanding of handling e-waste</li> <li>-need to prepare for handling e-waste in future</li> </ul>	Agree. Especially a lot of second hand products being sold in Africa

## Appendix 10: Innovation Theories on Competitiveness

Author, Year, Source	Theory/Business Model/Strategies	Critique
Les Robinson, 2009.	<p><i>A summary of Diffusion of Innovations.</i> How new ideas are taken up by the consumers/population process of social change:</p> <ul style="list-style-type: none"> <li>- What qualities make an innovation spread successfully?</li> <li>- The importance of peer-peer conversations and peer networks.</li> <li>- Understanding the needs of different user segments.</li> </ul>	<p>Weak private sector Weak institutions</p>
<p>Michel Callon (1991) and Bruno Latour (1992); John Law; others.</p> <p>Learning theories.com. (Knowledge base and Webliography)</p>	<p><b>Actor-Network Theory (ANT)</b> <b>The surrounding matters in diffusion of new innovations-Gravitational pull.</b> <b>Takes into account</b> cultural factors and restrictions placed upon him in his environment and various other technical and non-technical elements would all be described and considered in his actor-network. Builds on the <i>principle of generalized symmetry</i>; that is, what is human and non-human (e.g. artefacts, organization structures) should be integrated into the same conceptual framework and assigned equal amounts of agency. In this way, one gains a detailed description of the concrete mechanisms at work that hold the network together, while allowing an impartial treatment of the actors.</p>	<p>Does not explain why the network exists. Criticisms-</p> <p>1) the absurdity of assigning agency to nonhuman actors; (2) that ANT is amoral; (3) that because it assumes all actors are equal within the network, no accommodations for power imbalances can be made; and (4) that ANT leads to useless descriptions that seem pointless.</p>
<p>Henry Chesborough (2006). Open Innovation, Researching a new Paradigm, Oxford University Press (2006)</p>	<p><i>Open Innovation: A new Paradigm for Understanding Industrial Innovation.</i> [Open Model] Divergent from the traditional vertical integrated R&amp;D leading to internally developed products. Open innovation allows for ideas to come from within and without. It is the use of purposeful knowledge to accelerate internal innovations and expand markets for external use of innovations. This is a keen to outsourcing in the modern day globalization.</p>	<p>Useful information may not be widely accessible as some might be company secrets.</p>
<p>Matthew A. Zook (1997)</p>	<p><i>Technological Innovation And Theories of Regional Development.</i> Traditional theories of regional development based on Location Theory / Agglomeration Disequilibrium / Cumulative Causation Growth Poles.</p>	<p>Schumpeter and Solow (1928, 1929) growth theories of discontinuity and perpetual destruction in capitalistic economies</p>

<b>Author, Year, Source</b>	<b>Theory/Business Model/Strategies</b>	<b>Critique</b>
	<p>The manufacturing crisis of the 1970s resulted into new production architectures of managing –</p> <p>Theories of structural determinants of change (profit cycle, long cycles, path dependency);</p> <p>The restructuring of production and labour systems (post-industrialism, informationalism, and division of labour); and Flexible Production, New Industrial Space and Institutions.</p>	



**Appendix 11: Empirical Evidence of Innovation on Electrical and electronic Competitiveness**

Author, Year, Source	Study	Findings	Critique
Dorothy McCormick and Joseph Onjala, 2007	<i>Methodology for Value Chain Analysis in ICT Industry: Frameworks for the Study of Africa</i>	<p>ICT is transformational but impacts on economic development are least across African countries</p> <p>Challenges in human resource to fit into the technological advanced processes</p> <p>Limited factor adaptability to changing circumstances</p> <p>Inadequacy of research and design competences</p> <p>Short PLC with technology constantly changing</p> <p>Regulatory environment remains a challenge across Africa</p> <p>ICT penetration remains generally low compared to other African countries</p> <p>Lack of research on globally competitive chains</p>	Study is generic and does not spent more emphasis in any one country
F.I. Anyas i and P .A. Otubu. Research Journal of Information Technology 1(1): 1-5, 2009.	Mobile Phone Technology in Banking System: Its Economic Effect	<p>Role of mobile phones in banking industry, its economic implications and in general a systematic look into the various forms of mobile banking with emphasis on the security measures that makes the whole processing safer for adoption.</p> <p>Expanded the role of mobiles outside voice and SMS messaging context</p> <p>-Te emergence of mobile banking underscores the role of innovation in the emergence of new product or service segments hitherto not in operation</p>	Agree
Andrea Filippetti, European Journal of Innovation Management Volume: 14 Issue: 1, 5-26. 2011	<i>Innovation modes and design as a source of innovation: a firm-level analysis-</i> whose purpose is to contribute to the empirical literature, which investigates innovation modes, by exploring the role of design as a source of innovation. The	<p>-design and R&amp;D are complementary sources of innovation; design is predominant in firms characterized by a complex innovation strategy and intense interactions with the external environment; and these types of firms also show better economic performance.</p> <p>-Policies should recognize the importance of design-based competences, as they differ from those related to R&amp;D activities</p>	Study coverage is limited to the developed European market whose innovation competences are at different levels from those of the developing countries

Author, Year, Source	Study	Findings	Critique
	<p>empirical analysis was carried out at the firm-level, on the ground of a recent survey covering more than 5,000 European firms. Analysis was carried out at two levels. A factor analysis is carried out first, followed by a cluster analysis based on identified factors in order to ensure a significant number of homogeneous groups of firms.</p>	<p>- R&amp;D activity is regarded as the major internal source of knowledge, as well as a fundamental driver of firms' competitiveness</p>	
<p>Tor Guimaraes. European Journal of Innovation Management Volume: 14 Issue: 3 2011</p>	<p><i>Industry clock speed's impact on business innovation success factors.</i> The study was to prescribe important determinants of innovation success grouped into four main areas encompassing strategic leadership, competitive intelligence, management of technology, and specific characteristics of the company's innovation process in particular the industry speed at which new innovations are implemented. Multivariate regression analysis was carried out on a large sample of respondents</p>	<p>The industry speed (clock speed) acts as a moderator of the relationships between strategic leadership, competitive intelligence, management of technology, and specific characteristics of the company's innovation process with company success in business innovation</p> <p>The items used for measuring the main constructs provide further and more specific insights into how managers should go about developing these areas within their organizations.</p>	<p>All possible factors were not considered in the study since it is grounded in the literature of what until now have been four separate areas of knowledge, it proposed an integrated model for these areas important to business innovation, and empirically tested the mode</p>
<p>Darrell Mackus (2003).</p>	<p>Do you REALLY know what the competition is doing?</p> <p>A conceptual study on how Champions companies keep tabs on their competitors</p>	<p>Believes that if a company identifies, maps and analyses the opposition it will have a greater chance of success, which will then allow a plan to be formulated to give constant understanding and mapping of competitor movements.</p>	<p>Agree. In any case most products are close substitutes.</p>

Author, Year, Source	Study	Findings	Critique
	by finding out what their opposition is doing through competitive intelligence departments, or a third-party professional		
Kippenberger, T. Antidote, The, 3(5), 29-30. 1998	<p>Setting the offering apart from its competition.</p> <p>It uses Figures to show different strategies and modes. Concludes, when competitive shifts occur, firms must adapt their differentiation strategies to the new conditions, which puts new demands on their resources, capabilities and cultures</p>	Suggests one general framework that centres on the choices that customers make between competing offerings as firms compete for customers, the options for competitive strategy concern the ways in which firms can make their offerings different in the eyes of customers.	
Peter Skarzynski, Jorge Rufat-Latre. Strategy & Leadership Volume: 39 Issue: 1 2011	<p><i>Lessons to jumpstart disruptive innovation.</i></p> <p>To study the role of disruptive innovation is particularly important during recovery periods, as companies need to win back customers with radically new value propositions. The lessons were extracted from systematic observations of successful and unsuccessful industry disruptors</p>	<p>The study presents three critical lessons that companies must consider in their pursuit of disruptive innovation.</p> <p>These are the ability to anticipate and act on market discontinuities and unmet customer needs, with a particular focus on the business model;</p> <p>The ability to link incremental and breakthrough innovation efforts by focusing on a single, shared aspiration; and</p> <p>The recognition that disruptive innovation can inform strategy, just as strategy can (and should) inform disruptive innovation.</p> <p>These lessons could help companies envision and commercialize disruptive innovation that dramatically reshape the competitive landscape of their industries.</p>	

## Appendix 12: Market Access theories on Competitiveness

Author, Year, Source	Theory/Business Model/Strategies	Critique
Porter (1980; 1986 1990).	Competitive advantage based on competitive strategies of costs leadership, differentiation and focus	Demand and supply conditions
	Comparative advantage	
Ellis and Williams, 1995	Entry strategies in form of equity and non-equity	Born global companies
	Uppsala model , Kojima (1978)	Govt regulations
	Hackesher-Ohlin internationalisation model consistent with off-shoring	
	MNC of first mover advantage	
	Network theory	

### Appendix 13: Empirical Evidence of impact of market access on Electrical and electronic Competitiveness

Author, Year, Source	Study	Findings/Propositions	Critique
Kippenberger, T. <u>Antidote</u> , <u>The</u> Volume: 5 <u>Issue: 5</u> 2000	Competing on the Internet? Think of judo. This study applies Judo game theory as a strategy of 'useful mind-set' for any company in managing competition.	Used by Toyota and Nissan, when they wanted to break into the US car market in the 1970s to aid in speed and agility to avoid the traps - Sega v Nintendo in the hand-held video games market. - Concludes, in the end, opponents must be tipped off balance — even ants can topple much bigger opponents by 'having a go'	
Mwakaje (2010)	<i>Information and Communication Technology for Rural Farmers Market Access in Tanzania,</i>	Technology transfer is feasible in developing countries. Tanzanian rural farmers with minimal education	
Nasab, & Aghaei, (2010)	<i>The Effect of ICT on Economic Growth: Further Evidence</i>	Panel research of OPEC countries concludes that countries investing in ICT experience significant growth prospects	
Jack & Suri (2010)	ICT investment	investment in ICT technology opened up new spheres of economic activity	

## Appendix 14: Logistics Theories

Author, Year, Source	Theory/Business Model/Strategies	Critique
Porter, 1990.	Resource based View of the Firm- Addresses fundamental strategic management question of why is it that some firms persistently outperform others.	Ignores, Dynamism of the environment
Joseph Schumpeter (1883-1950)	Theory of economic development based on five types of economic innovations: set up or discovery of new product, a new manufacturing process, a new market, source or new organization (Letenyei, 2001)	Ignores the rate at which the environment changes Product life cycles are becoming shorter
1950s Marketing mix framework	The 4 Ps- marketing strategies for competitive advantage. Four elements namely product or service, price, place, and promotion.	The traditional market mix has been expanded by additional of variables people, processes and physical evidence. IT plays a crucial role in enhancing efficiency and connectivity in marketing and increasing demand for services. E.g. electronic online delivery of services e.g. vi a page on the World Wide Web
Gaur et al, 2009. Conflict Resolution in the Scheduling of Television Commercials. gaur@cs.ca	We extend a previous model for scheduling commercial advertisements during breaks in television programming. The proposed extension allows differential weighting of conflicts between pairs of commercials. We formulate the problem as a capacitated generalization of the max $k$ -cut problem in which the vertices of a graph correspond to commercial insertions and the edge weights to the conflicts between pairs of insertions. The objective is to partition the vertices into $k$ capacitated sets to maximize the sum of conflict weights across partitions. We note that the problem is NP-hard. We extend a previous local-search procedure to allow for the differential weighting of edge weights. We show that for problems with equal insertion lengths and break durations, the worst-case bound on the performance of the proposed algorithm increases with the number of program breaks and the number of insertions per break, and that it is independent of the number of conflicts between pairs of insertions. Simulation results suggest that the algorithm performs well even if the problem size is small.	

Author, Year, Source	Theory/Business Model/Strategies	Critique
Walley, 1998. The TQM Magazine, Vol. 10(3), 186–189.	<p>Competition; what does it really mean</p> <p>Companies compete in various aspects i.e. products (and services) and costs.</p> <p>Three sources of differential advantage:</p> <p>(1) time-based competition;</p> <p>(2) being a global competitor; and</p> <p>(3) Focus on core competencies.</p> <p>But, because most companies have sought competitive advantage from these sources already, then they offer a reduced potential for actually delivering competitive advantage.</p>	<p>This depends on the nature of the firms and is also subject to competitor activity.</p> <p>The investments involved may be too high that some decisions cannot be reversed due to their financial impact.</p>
<p>Nandakumar M. K., Ghobadian &amp; O’regan N., 2010. International Journal of Productivity and Performance Management Vol. 60 No. 3, 2011pp. 222-251</p>	<p>Generic strategies and performance – evidence from manufacturing firms</p> <p>Purpose – The purpose of this study is to examine the relationship between business-level strategy and organisational performance and to test the applicability of Porter’s generic strategies in explaining differences in the performance of organisations.</p> <p>Findings – The results of this study indicate that firms adopting one of the strategies, namely cost-leadership or differentiation, perform better than “stuck-in-the-middle” firms which do not have a dominant strategic orientation. The integrated strategy group has lower performance compared with cost-leaders and differentiators in terms of financial performance measures.</p> <p>This provides support for Porter’s view that combination strategies are unlikely to be effective in organisations. However, the cost-leadership and differentiation strategies were not strongly correlated with the financial performance measures indicating the limitations of Porter’s generic strategies in explaining performance heterogeneity in organisations.</p>	<p>This may be subject to environmental issues such as regulation.</p> <p>In some cases some decisions may be very difficult to reverse especially investment decisions</p>
Nasri, 2010. Competitive intelligence in Tunisian companies	<p>Purpose – This paper sets out to investigate the link between market orientation and manufacturing performance for small and medium enterprises in India.</p> <p>Design/methodology/approach – The paper collected the data for this research through intensive surveys of the CEOs or top managers of small and medium-sized enterprises in India.</p>	<p>These are subject to resource constraints and information asymmetry in the market.</p>

Author, Year, Source	Theory/Business Model/Strategies	Critique
	<p>The paper utilized scales, well established in literature, and revalidated them for the Indian context. It also utilised confirmatory factor analysis for scale validation, and hierarchical regression analysis for testing the hypotheses.</p> <p>Findings – This study found a positive link between two sub-dimensions of market orientation – customer orientation and inter-functional coordination – and manufacturing performance. Competitor orientation, however, did not have a positive impact on manufacturing performance. Further, the paper found that firm resources and competitive intensity moderate the relationship between some of the sub-dimensions of market orientation and firm performance.</p> <p>Research limitations/implications – This study is particularly relevant for personnel involved in the manufacturing functions as it studies the effect of market orientation on manufacturing performance. It is high time that firms with manufacturing focus realize the value of market forces and revamp various production processes to be more responsive to market needs and demands.</p> <p>Originality/value – This research looks at manufacturing performance, rather than a firm’s financial performance, and thereby helps in understanding the intervening processes that potentially lead to superior firm performance. It also identifies some important contingency factors, enriching the literature on market orientation. Finally, the empirical context of this research is quite novel and useful for European and other foreign firms trying to operate in emerging economies such as India.</p>	
Sapprasert, 2006. The Impact of ICT on the Growth of the Service Industry. University of Oslo, Norway	<p>Both productivity and profitability growth are found to be significantly linked to level of ICT intensity in service firms especially when undertaken jointly with non-technological innovations.</p> <p>Services are typically interactive, involving immense communication between service suppliers and clients in all phases of service activity. Insurance sector is as well information intensive. ICT innovation focuses on these communicative and transactional operations. ICT friendly atmosphere is important</p>	In agreement. Most ICT projects fail or have less impact as they are not linked to other organizational management practices like changes in job design, accountability.



Author, Year, Source	Theory/Business Model/Strategies	Critique
	characteristics of service industry and has provided rapid growth of services and profitability. ICT changes services cost, output and quality. OECD (2002) support this and indicate that services are major users and adopters of new technologies especially ICT.	

## Appendix 15: Empirical Effects of Logistics on Electronic and Electrical Competitiveness

Author Name & Year	Study	Proposition/findings	Critique
Waithaka , C.W, 2010.  MA thesis on Procurement	Influence of Supplier involvement strategies in Procurement: A case of Rose Cut Flower Farms In Kenya	Flower managers felt that there was No strategic impact on involvement of suppliers in strategic purchasing for cost reduction for existing products. However, when new products are involved, suppliers form part of the arrangement and information is freely shared for cost reduction.  Flower farms see no significance in involving external suppliers in logistics planning. Nevertheless involvement in logistics and communication in transportation bore benefits  Most rose farm suppliers are not aware of the concept of logistics management in business	Disagree
Kathure, N.D. B., 2010	Benefits of Outsourcing in Organisations: A case study of KPLC	8 % of respondents approved outsourcing because of reduction in costs, reduction in lead time, efficiency gains  Those opposed to outsourcing cited poor workmanship, lengthening customer service chain  Out sourcing same activities done internally will create conflict  Leads to concentration in core activities, management of the wage bill  Outsourcing creates efficiency	Disagree- Need firm contract arrangements
Garicano, L., Heaton, P. ( 2010)	IT, Organization and productivity. A panel data set of police department that covered 1987-2003.	No significant relationship between crime fighting and productivity improvement. Productivity improvement become relatively significant when IT adoption is undertaken as part of whole package of organizational changes by identifying specific ways in which new information and data when considered availability interact with existing organizational practices and make adjustments accordingly.	The argument is justifiable. AKI spend millions of money when they procured an IT system that they thought would reduce false claims. The system did not reduce or deter this problem and this project was abandoned before benefits

Author Name & Year	Study	Proposition/findings	Critique
			were realized.
Epetimehin, F. M. (April, 2011). Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 2(1). pp 18-21.	Achieving Competitive Advantage in Insurance Industry: The Impact of marketing Innovation and Creativity	<p>Creativity and innovation is important factor in providing new services to satisfy client's needs.</p> <p>Innovation in pricing and promotion and innovation and creativity in distribution, technological innovations are crucial in attracting new clients.</p> <p>Upper management perception and acknowledgement of innovation and creativity in insurance industry helps in motivating and innovation and creativity in insurance sector. Need for research and development unit</p> <p>Suggested a service recovery strategy for correcting the errors that may occur when providing the services for the clients will help insurance industry in keeping the clients satisfied and attract new clients</p>	Acknowledged the role of senior management in motivating the
Sapprasert, 2006. University of Oslo, Norway	The Impact of ICT on the Growth of the Service Industry.	<p>Both productivity and profitability growth are found to be significantly linked to level of ICT intensity in service firms especially when undertaken jointly with non-technological innovations.</p> <p>Services are typically interactive, involving immense communication between service suppliers and clients in all phases of service activity.</p> <p>Insurance sector is as well information intensive. ICT innovation focuses on these communicative and transactional operations. ICT friendly atmosphere is important characteristics of service industry and has provided rapid growth of services and profitability. ICT changes services cost, output and quality. OECD (2002) support this and indicate that services are major users and adopters of new technologies especially ICT.</p>	In agreement. Most ICT projects fail or have less impact as they are not linked to other organizational management practices like changes in job design, accountability.
Pieter Klaas Jagersma. Business Strategy	<i>Competitive information logistics</i> whose purpose of this paper is to understand	Carry out a stepwise implementation of relevant platforms for IT/IS, knowledge/information management, R&D,	Technology changes so fast that logistics on a type of

Author Name & Year	Study	Proposition/findings	Critique
Series Volume: 12 Issue: 3 2011	the specific components of effective information logistics. A total of 44 interviews were carried out with executives responsible for information logistics-related issues such as IT/IS, knowledge/information management, R&D, purchasing/supply chain management, operations management and market research.	purchasing/supply chain management, operations management and market research. Information logistics helps to improve processes, promote employee learning, improve the speed and quality of services to customers, underpin new forms of commercial activity, and, can go even further by generating entirely new value propositions for customers. Companies such as Goldman Sachs, Merck, HSBC and Bain & Company thrive through successful information logistics strategies.	platform become obsolete.  The sample studies was small to be applied generally
Ryan, J., & Silvano, S. Marketing Intelligence & Planning Volume: 29 Issue: 3 2011	<i>A brand for all the nations: The development of the World Heritage Brand in emerging markets.</i>	Two significant statistical relationships: (1) the number of existing WHS is, as hypothesized, positively related to applications for additional sites and (2) the countries standing on the Democracy Index is significantly related to applications, but negatively, not positively, as had been hypothesized  Branding provides a framework for managing the image of a place and is an important component of destination marketing. The World Heritage Site (WHS) designation as a de facto brand is of importance to developing nations because it is available without cost. It seeks to identify economic, political and other factor which dispose emerging countries to seek WHS designations. This study is based on a multivariate analysis of data on 48 emerging countries in which their predisposition to seek WHS designations is predicted by indicators measuring: on-going involvement with tourism, number of existing WHS sites, level of democratization, and the Human Development Index. The dataset is used to test four hypotheses.	Study is hypothetical
Garicano, L., Heaton, P. (2010)	IT, Organization and productivity. A panel data set of police	No significant relationship between crime fighting and productivity improvement. Productivity	The argument is justifiable. AKI spend millions of

Author Name & Year	Study	Proposition/findings	Critique
	department that covered 1987-2003.	improvement become relatively significant when IT adoption is undertaken as part of whole package of organizational changes by identifying specific ways in which new information and data when considered availability interact with existing organizational practices and make adjustments accordingly.	money when they procured an IT system that they thought would reduce false claims. The system did not reduce or deter this problem and this project was abandoned before benefits were realized.
Epetimehin, F. M. Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 2(1), 18-21	Achieving Competitive Advantage in Insurance Industry: The Impact of marketing Innovation and Creativity	Creativity and innovation is important factor in providing new services to satisfy client's needs. Innovation in pricing and promotion and innovation and creativity in distribution, technological innovations are crucial in attracting new clients. Upper management perception and acknowledgement of innovation and creativity in insurance industry helps in motivating and innovation and creativity in insurance sector. Need for research and development unit Suggested a service recovery strategy for correcting the errors that may occur when providing the services for the clients will help insurance industry in keeping the clients satisfied and attract new clients	Acknowledged the role of senior management in motivating the
Sapprasert, 2006. University of Oslo, Norway	The Impact of ICT on the Growth of the Service Industry.	Both productivity and profitability growth are found to be significantly linked to level of ICT intensity in service firms especially when undertaken jointly with non-technological innovations. Services are typically interactive, involving immense communication between service suppliers and clients in all phases of service activity. Insurance sector is as well information intensive. ICT innovation focuses on these communicative and transactional operations. ICT friendly atmosphere is important characteristics of	In agreement. Most ICT projects fail or have less impact as they are not linked to other organizational management practices like changes in job design, accountability.

Author Name & Year	Study	Proposition/findings	Critique
		<p>service industry and has provided rapid growth of services and profitability. ICT changes services cost, output and quality. OECD (2002) support this and indicate that services are major users and adopters of new technologies especially ICT.</p>	
<p>Walley K (1998)</p> <p>The TQM Magazine Vol. 10(3) 186–189.</p>	<p>Competition; what does it really mean</p>	<p>Companies compete in various aspects i.e. products (and services) and costs.</p> <p>Three sources of differential advantage:</p> <p>(1) time-based competition; (2) being a global competitor; and (3) Focus on core competencies.</p> <p>But, because most companies have sought competitive advantage from these sources already, then they offer a reduced potential for actually delivering competitive advantage.</p> <p>They should seek other sources of competitive advantage for future corporate success in the future.</p> <p>Finally, a good understanding of competition is essential if practitioners are to implement best practices and principles as to maximise competitiveness of a company's products and services.</p>	<p>This depends on the nature of the firms and is also subject to competitor activity.</p> <p>The investments involved may be too high that some decisions cannot be reversed due to their financial impact.</p>
<p>Wadie Nasri 2010</p>	<p>Competitive intelligence in Tunisian companies</p>	<p>Competitive intelligence as a strategic business tool has long been proposed in an effort to increase a company's competitiveness (Montgomery and Urban, 1970; Pearce, 1976; Montgomery and Weinberg, 1979; Porter, 1980). It is an important aspect of strategic management because it serves as the first link in the chain of perceptions and actions that permit an organization to adapt to its environment.</p> <p>Competitive intelligence provides knowledge of competitors, their marketing strategies, objectives,</p>	<p>These are subject to resource constraints and information asymmetry in the market.</p>

Author Name & Year	Study	Proposition/findings	Critique
		<p>research activity, their strengths and weaknesses and other information. This analysis helps companies in understanding their position</p> <p>-competitive intelligence can be viewed as a “process for supporting both strategic and tactical decisions, and in order to support competitive intelligence, organizations need systems and processes to gather and analyse reliable, relevant, and timely information that is available in vast amounts about competitors and markets” (Cobb, 2003).</p> <p>The results show that Tunisian managers are conscious of the importance of competitive intelligence in the management of their companies.</p> <p>Second, managers believe that internal sources of information are more valuable than external sources information and personal source information is deemed most valuable.</p> <p>Third, the results of the process and structure questions indicate that companies may not yet be investing appropriately in building the internal infrastructure required for fully effective intelligence efficacy.</p> <p>Finally, this practice is not organised in a separate department and, if it is mostly done in the marketing department.</p> <p>Implications - To know and develop this practice, a company must, on the one hand, build internal competitive intelligence process. On the other hand, develop a sensitisation programme that is continuous and that should focus on telling employees what competitive</p>	

Author Name & Year	Study	Proposition/findings	Critique
		intelligence	
Rodger Bennet 2008  Market intelligence and Planning 21/6 (2008) pg 336-345	Competitor analysis practices of British charities	The benefits of competitor analysis to a management team are sensitization (awareness of organizational vulnerability), legitimation (justification of a course of action), inspiration (generation of fresh ideas and problem solving), benchmarking (comparison with external criteria), improved planning and decision making.	The length and breadth of the analysis will determine the extent to which the benefits shall be enjoyed.
McCray J, Gonzales J. & Darling J. (2010).  European Business Review Vol. 23 No. 3, 2011 pp. 240-255	Crisis Management in Smart phones; The case of Nokia and apple	Failure of Nokia to take timely transformational management change in order to cope with competition. Apple due to its failure to engage in a timely transformational response to the competitive innovations of Apple.  A crisis, creates opportunities for change in the life of a business firm when that firm recognizes a crisis and makes appropriate changes in its operations to facilitate positive growth and development. However, the initial stage of a crisis must be recognized and appropriately responded to. The crisis management paradigm that is the foundation for this case analysis focuses on four stages of a crisis: the preliminary crisis, acute crisis, chronic crisis, and crisis resolution.  The case deals with the innovations of Apple that have enabled the firm to become a direct competitor to Nokia in the smart phone market.  The preliminary crisis stage was not appropriately recognized by Nokia, and the firm was thrust into an acute crisis that has now evolved into a chronic crisis. A brief overview is presented of the historical development of both Nokia and Apple, and an analysis of the present crisis situation in which Nokia now finds it is presented in some detail.	One may not be able to predict competitor activity quickly enough to be able to give a timely response
Nandakumar M. K., Ghobadian & O'regan N.	Generic strategies and performance – evidence from manufacturing firms	Purpose – The purpose of this study is to examine the relationship between business-level strategy and organisational performance and to	This may be subject to environmental issues such as



Author Name & Year	Study	Proposition/findings	Critique
<p>(2010)</p> <p>International Journal of Productivity and Performance Management Vol. 60 No. 3, 2011 pp. 222-251</p>		<p>test the applicability of Porter’s generic strategies in explaining differences in the performance of organisations.</p> <p>Findings – The results of this study indicate that firms adopting one of the strategies, namely cost-leadership or differentiation, perform better than “stuck-in-the-middle” firms which do not have a dominant strategic orientation. The integrated strategy group has lower performance compared with cost-leaders and differentiators in terms of financial performance measures. This provides support for Porter’s view that combination strategies are unlikely to be effective in organisations. However, the cost-leadership and differentiation strategies were not strongly correlated with the financial performance measures indicating the limitations of Porter’s generic strategies in explaining performance heterogeneity in organisations.</p>	<p>regulation.</p> <p>In some cases some decisions may be very difficult to reverse especially investment decisions</p>
<p>Gaur S. S., Vasudevan H &amp; Gaur A. S (2009). European Journal of Marketing Vol. 45 No. 7/8, 2011 pp. 1172-1193</p>	<p>Market orientation and manufacturing performance of Indian SME’s</p>	<p>Purpose – This paper sets out to investigate the link between market orientation and manufacturing performance for small and medium enterprises in India.</p> <p>Design/methodology/approach – The paper collected the data for this research through intensive surveys of the CEOs or top managers of small and medium-sized enterprises in India.</p> <p>The paper utilized scales, well established in literature, and revalidated them for the Indian context. It also Utilised confirmatory factor analysis for scale validation, and hierarchical regression analysis for testing the hypotheses.</p> <p>Findings – This study found a</p>	

Author Name & Year	Study	Proposition/findings	Critique
		<p>positive link between two sub-dimensions of market orientation – customer orientation and inter-functional coordination – and manufacturing performance. Competitor orientation, however, did not have a positive impact on manufacturing performance. Further, the paper found that firm resources and competitive intensity moderate the relationship between some of the sub-dimensions of market orientation and firm performance.</p> <p>Research limitations/implications – This study is particularly relevant for personnel involved in the manufacturing functions as it studies the effect of market orientation on manufacturing performance. It is high time that firms with manufacturing focus realize the value of market forces and revamp various production processes to be more responsive to market needs and demands.</p> <p>Originality/value – This research looks at manufacturing performance, rather than a firm’s financial performance, and thereby helps in understanding the intervening processes that potentially lead to superior firm performance. It also identifies some important contingency factors, enriching the literature on market orientation. Finally, the empirical context of this research is quite novel and useful for European and other foreign firms trying to operate in emerging economies such as India.</p>	
Meng X (2011)	Performance management models in facility management: a comparative study	Purpose – The purpose of this paper is to compare the major performance measurement models, hereafter called performance models for short, and investigate their application in the context of facility management (FM), based on which the effectiveness of these models is	The tools used in different firms could also depend on the nature, size, complexity and resource base of different

Author Name & Year	Study	Proposition/findings	Critique
		<p>identified and the most important performance indicators are recommended.</p> <p>Design/methodology/approach – A combination of literature review, expert interview and questionnaire survey is adopted in this study. A literature review and a series of expert interviews help to identify the performance models spread in general and applied to FM in particular. Based on the literature review and expert interviews, a questionnaire survey is carried out in the UK and Ireland to investigate the application of performance models in FM practice.</p> <p>Findings – The review of relevant literature shows that in recent years various models have been developed to measure and improve the performance of organisations. The application of such models within FM organisations is evaluated in this study.</p> <p>It is found that the Key Performance Indicators (KPI), the Balanced Scorecard (BSC), and the Business Excellence Model (BEM) are more widely accepted and more effective than others. This is similar to the findings by a previous construction study. FM organisations benefit from effective performance measurement. When measuring performance, it is important for them to select the appropriate models and indicators.</p> <p>Conclusion - A comprehensive literature review is carried out in this study, which contributes to the systematic summary of the performance models developed in the last 20 years.</p> <p>Based on the empirical data collected from a questionnaire</p>	<p>organisations.</p>

Author Name & Year	Study	Proposition/findings	Critique
		<p>survey and a series of expert interviews, the application and the effectiveness of existing performance models are examined in the context of FM, through which the three commonly used models are identified: the KPI, BSC and BEM. This is another contribution of the study. By comparison, the KPI is more popular with FM practitioners and organisations.</p> <p>In addition to the selection of effective performance models, the proper selection of performance indicators is also important to the measurement and improvement of FM performance.</p>	
<p>Gillward, A. &amp; Mureithi, M. (2011). <i>Info</i>, 3(1), 32-46</p>	<p>Regulatory intervention or Disruptive competition? Lessons from East Africa on the end of international roaming charges</p>	<p>The case study demonstrates the importance of an enabling policy and regulatory environment, which allowed operators to integrate historically separate national networks into cross-border operations, undermining roaming markets in the region and ending roaming charges in East Africa forever. With the high price of communications in East Africa and the premium charges placed on international mobile roaming, the effect of this move was to compel other regional operators to follow suit, and further, to institute various other pricing strategies in an attempt to retain or recover their dominant positions. As a result, not only did roaming charges disappear across major networks, but the prices of various other mobile services also fell as subscriber numbers soared.</p>	<p>This may vary especially in international contexts since an aspect may be legal in one set up and illegal in another.</p>
<p>Sparks L (2010) <i>International Journal of Retail &amp; Distribution Management</i></p>	<p>Settling for second best? Reflections after the tenth anniversary of Walmart's entry to the united kingdom.</p>	<p>Findings – Despite the strong rhetoric on entry, the commercial reality has seen only moderate success for Asda and a widening gap to the market leader, Tesco. Explanation for this includes competitive strategy and reactions, market restrictions particularly in</p>	<p>In some countries the state may be a participant or have a particular stake in the industry in question.</p>

Author Name & Year	Study	Proposition/findings	Critique
Vol. 39 No. 2, 2011 pp. 114-129		<p>land-use planning and unwillingness by Asda (Wal-Mart) to alter their focused store format strategy in line with competitor actions and market directions.</p> <p>Research limitations/implications – The analysis is at a macro corporate and national level, drawing mainly on published data.</p> <p>Research implications include the rebalancing of considerations of organisational competence and market environment factors on international success. A focus on political and non-market activities is suggested, though an unwillingness of companies to reconsider strategic directions is also indicted as a key factor.</p>	There may be other ways of dealing with this based on porters generic model

## Appendix 16: Operational Environment theories

Author, Year, Source	Theory/Business Model/Strategies	Critique
Levy (2007)	<p>“The National Medium- and Long-Term Plan for the Development of Science and Technology (2006-2020)”. Called for scientific advancement because “despite the size of our economy, our country is not an economic power, primarily because of weak innovative capacity. China is uneasy on its position on the technology ladder though it is a large economy. They found that for an iPod with \$194 in “captured value” \$80 went to Apple and \$4 went to the manufacturers in China</p> <p>China now resorting to its indigenous innovation policies, technology to move to fore in manufacturing</p>	
Walley, 1998. The TQM Magazine Volume 10(3), 186–189.	<p>Competition; what does it really mean</p> <p>Companies compete in various aspects i.e. products (and services) and costs.</p> <p>Three sources of differential advantage:</p> <ul style="list-style-type: none"> <li>(1) time-based competition;</li> <li>(2) being a global competitor; and</li> <li>(3) Focus on core competencies.</li> </ul> <p>But, because most companies have sought competitive advantage from these sources already, then they offer a reduced potential for actually delivering competitive advantage.</p>	<p>This depends on the nature of the firms and is also subject to competitor activity.</p> <p>The investments involved may be too high that some decisions cannot be reversed due to their financial impact.</p>

## Appendix 17: Empirical evidence of Operational environment on Competitiveness

Author, Year, Source	Study	Findings	Critique
Jackson, M., Houdard, F., & Highfield, M. (2008). <i>Journal of Business Strategy</i> , 29(1), 34-39.	<p><i>Room to grow: business location, global expansion and resource deficits.</i> The conceptual framework is derived from trends in economic growth in emerging markets, global strategies, and the BOP market, then analyses the blue ocean strategy (BOS) of value innovation.</p> <p>The viewpoints are concerning the value and validity of the bottom of the pyramid (BOP) model, as a strategy for multi-national corporation (MNC) growth. The model adds to the discussion of strategic possibilities to tap the potential of emerging markets.</p>	The paper develops the Value Flame at the Base of the Pyramid (VFBOP) model by combining BOP and BOS strategies to potentially offer opportunities for MNC market entry as well as market supply, to drive revenues and expand global market share.	No empirical research is available to validate the model
Jackson, M., Houdard, F., & Highfield, M. (2008). <i>Journal of Business Strategy</i> , 29(1), 34-39.	<p><i>Room to grow: business location, global expansion and resource deficits.</i> The article discusses some of the issues a company is likely to encounter when establishing business operations in emerging markets.</p> <p>Observations and viewpoints have been derived from working in emerging markets and assisting companies select locations for business operations. Building a sustainable global business platform is increasingly a fundamental requirement for success in today's marketplace.</p> <p>International locations can bring with them concealed business establishment and mid- to long-term operational risks that are specific and unique to each micro-geography</p>	<p>There are at three common challenges that are often encountered in foreign markets: labour market issues, land availability, and provision of utilities.</p> <p>CEOs have to evaluate these locations extensively before committing substantial resources</p>	The appropriate internationalization strategy has to be employed in markets where the environment is not clear

EPC, 2008	A Summary of Key Investment Opportunities in Kenya	BPO is one of the prioritized areas of future American Sociological Association investment under Vision 2030	
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**Appendix 18: Matrix for Establishment of Variables for study on Kenyan Manufacturing Competitiveness in Electrical and Electronics**

Reference study	Theory	Variables	Area of focus	Methodology
Breton Alexander Newton. 2008. The Factors Affecting the Location of Foreign Direct Investment by U.S. Companies Pre and Post 9-11 (April 2001). Thesis	OLI	Market seeking  Location-efficiency  Strategic factors	Resources Economic stability Political stability Consumer demand FDI flows Legal systems Democratic systems trade barriers, infrastructure, Market access incentives, international alliances, political systems economic structure cultural systems	OLS Inclusion of control measures
WEF, 2011. Global Competitiveness Report, 2010-2011. Geneva, Switzerland 2011	Competitiveness	Institutions  Policies  Productivity factors	Legal Admin structure Governance systems Macroeconomic –inflation, public debt, Market access-fiscal and monetary policies Market based economies Financial mkt operations Business sophistication Infrastructure-transport, energy Health/education Labour mkt efficiency	Descriptive analysis

Reference study	Theory	Variables	Area of focus	Methodology
			Technology readiness Market size innovation	
Okello, Julius J. and Ndirangu, Lydia K., 2010. Does the environment in which ICT-based market information services (MIS) projects operate affect their performance? Experiences from Kenya	Transaction cost theory  Contract theories	Credit scheme for loan recoveries  Logistics services  Operational environment	Farmer Groups (clusters)  Buyers and input dealers ICT-based MIS Political environment Regulations Socio-economic Physical infrastructure Culture of truth	Descriptive statistics
Revitalising the EE manufacturing sector in Malaysia on semiconductors, home appliances and industrial electronics as well as new technologies like solar and LED		Enablers	Govt regulations Ease of dealing with govt Right incentives Availability of labour Cost of labour Cost of utilities Productivity of labour Availability of water Proximity and access to air logistics Availability of land Cost of land Availability of financing Proximity and availability of sea logistics Packaging	Export share  Concentration sectors  Measure of expected growth linked to global demand
E-waste management		PCs Monitors Printers	Waste management	Descriptive statistics
McDade, Spring,	Global	Gender/Demograp	Business	Descriptive

Reference study	Theory	Variables	Area of focus	Methodology
(2005). The 'new generation of African entrepreneurs': networking to change the climate for business and private sector-led development (coverage -Ghana, Senegal, Mali, Ethiopia, Kenya, Uganda, Botswana, South Africa, Zambia, and Zimbabwe	operators	<p>hics</p> <p>MSE</p> <p>Large</p> <p>SOE</p> <p>Memberships/networks (DV)</p>	<p>enablers</p> <p>Business support operations (Advertising Marketing Internet usage, websites)</p> <p>Staff skills</p> <p>Information sharing culture</p> <p>How started, future direction, national/international networks</p> <p>Professional connections (local, regional and international)</p> <p>Business experience (length of time in operation)</p> <p>Business practices-modern or traditional</p>	<p>statistics</p>
Kale, Arditi, 2002. Competitive Positioning in United States Construction Industry- based in USA	Competitive positioning based on strategies and tactics	<p>performance, features, durability, serviceability, aesthetics, conformance to specifications, and perceived quality</p>	<p>Time</p> <p>Innovation</p> <p>Cost</p> <p>Technology</p>	<p>Descriptive statistics</p> <p>Regression analysis</p> <p>t-tests of significance</p> <p>ANCOVA analysis</p>
Technology				
Bell, 2010. Network theories for technology-enabled	Actor network theory	Learning	Internet use-connecting nodes,	symmetrical analysis taking into account

Reference study	Theory	Variables	Area of focus	Methodology
learning and social change: Connectivism and Actor Network theory. Proceedings of the 7th International Conference on Networked Learning 2010, Edited by: Dirckinck-Holmfeld L, Hodgson V, Jones C, de Laat M, McConnell D & Ryberg T	Connectivism theory-digital based	Innovation Education Capacity to know more Resources Technology	Internet penetration  Web-sofwares, Time based date from googling	decay processes (PLC)
Blomström and Kokko, 1997. The Impact of Foreign Investment on Host Countries: A Review of the Empirical Evidence. Copy of World Bank Policy Research Working Paper No. 1745	transfer and diffusion of technology from foreign multinational s to their host countries.  international trade a- inflows of foreign capital - whether in the form of FDI or portfolio capital - will raise the marginal product of labour - demonstratio n effects	Productivity FDI-MNC Technology transfer Innovation Trade effects- partnerships, distribution networks	Ownership  Intra-firm arrangement  Exports Training from MNC  Backward and forward linkages Market structure	ANOVA analysis on basis of passive and active roles against informal and formal arrangements  Multiple regression analysis
Omar and Stoever, 2008. The role of technology and human capital in the EPZ life-cycle. <i>Transnational Corporations,</i>	PLC Clustering  Liberalisation - but with no linkages outside EPZ	Incentives-EPZ type  Institutions	FDI flows into EPZs	Descriptive statistics during phased periods

Reference study	Theory	Variables	Area of focus	Methodology
	Structural transformation			
Logistics, 2003. E-Commerce and e-Business		<p>The Information Age</p> <ul style="list-style-type: none"> <li>• Nets, Webs and the Information Infrastructure</li> <li>• e-Commerce and e-Business</li> <li>• Legal and Regulatory Issues for the Information Economy</li> <li>• e-Government;</li> <li>• ICT and Education</li> <li>• Genes, Technology and Policy: An Introduction to Biotechnology</li> </ul> <p>Technology</p> <p>Government</p> <p>Innovation</p>	<p>Operational environment</p> <p>Transport infrastructure</p> <p>Internet economy layer</p> <p>B2B</p> <p>B2C</p> <p>B2G</p> <p>C2C</p> <p>Marketing</p> <p>Promotion</p> <p>Legal</p> <p>Political framework</p> <p>Electronic payment systems</p> <p>Electronic procurement</p> <p>e-banking</p>	
Mas and Radcliffe, Bill & Melinda Gates Foundation, 2010. Mobile Payments go Viral: M-PESA in Kenya	<p>Network based-Pushing and pulling money</p> <p>Leveraging technology and partnerships</p>	<p>HRD</p> <p>Institutions</p> <p>Networks</p> <p>Financial services</p>	<p>M-Pesa technology</p> <p>Liberal Regulations</p> <p>Monopoly</p> <p>Trust</p> <p>Access</p>	<p>Graphics</p> <p>Descriptive</p> <p>Comparative analysis</p>
	PACA Cycle-Plan Act, Create, Assess	Efficiency	<p>Benchmarking</p> <p>Process</p> <p>Strategic</p> <p>Global</p> <p>Competitive</p>	<p>Qualitative</p> <p>Quantitative analysis</p> <p>Profile analysis</p>

Reference study	Theory	Variables	Area of focus	Methodology
		Innovation	Competitor profile Clustering New product/processes New management practices	
Cantwell, 2003. Innovation and Competitiveness	Efficiency in resource allocation	Capital Resources Competences Market Size Information access	Saving ratios Clusters Skills-education Market access, Regional integration	Descriptive
BOLDRIN AND LEVINE, PERFECTLY COMPETITIVE INNOVATION	Constant/increasing returns to scale	Innovation Entrepreneurship Profits	Pricing R&D	
Andrew Sharpe and Ian Currie, 2008. Competitive Intensity as Driver of Innovation and Productivity Growth: A Synthesis of the Literature. CSLS Research Report No. 2008-3		Productivity Policy Markets R&D Internationalisation Structuralists	Market share- Entry strategy Privatization Regulations Liberalisation Capital markets Trade reforms Infrastructure service Government service	HHI=Mkt share sqd Competitive index Price cost margin TFP Firm Size as Predictor of "Innovation Performance Concentration Trade protection Deregulation Minimum wages

Reference study	Theory	Variables	Area of focus	Methodology
			Labour market policies Macroeconomic policies Taxation reform	
OECD, 2000. MAIN DETERMINANTS AND IMPACTS OF FOREIGN DIRECT INVESTMENT ON CHINA'S ECONOMY. Working Papers No. 2000/4	OLI Comparative and competitive advantage	-Size and GDP growth -HR endowment-L-productivity -Physical, financial and technological infrastructure -Openness to international trade and access to international markets -Development of the regulatory framework and economic policy coherence -Investment protection and promotion	Time series secondary data Labour skills and costs Market access, Tariff, Quotas Role of SOEs Local content  FDI inflows Contract laws SEZs	Analysis of FDI aligned to periods of policy changes  Descriptive analysis GCFR
Afif, 2009. PRODUCTION FRAGMENTATION IN ELECTRICAL COMPONENTS Is Morocco competitive enough? (Thesis)	OLI-fragmentation due to change in trade systems	Factor costs Transaction costs Location Advantage Regional integration Trade facilitation FDI and MNC N-S specialisation	Pricing Transport, insurance, Politics, incentives Markets Trade systems	Product fragmentation thru imports for processing and re-exports Balasa Index of Revealed Comparative Advantage (RCA) Doing Business Index Export share index
Gereffi, G., Humphrey, J. & Sturgeon, T. (2005). Measuring success in the global economy: international trade,	Lall technology impact on development	Global buyers and suppliers	Global networks	Descriptive International sourcing Support services

Reference study	Theory	Variables	Area of focus	Methodology
industrial upgrading, and business function outsourcing in global value chains.				
Determinants of FDI Flows in Africa.	Operational Environment OLI	Capital stock	FDI flows	Lagged, OLS
Innovation: Applying knowledge in development	Diffusion	Platform-ICT Infrastructure Skills Promotion and marketing Governance structures	Incentives Regulations Global requirements on environment Institutions Visioning as a strategy	Descriptive
IISD, (2009). Towards sustainable outsourcing: a responsible competitiveness agenda for it-enabled services		Business environment BPO Talent-specialisation Compliance to international market requirements Innovation Smart philanthropy	ICT logistics support Information access Policy environment Legal and regulatory environment	Descriptive
Keane, 2008. A 'New' Approach to Global Value Chain Analysis. Overseas Development Institute 2008	Coordination	I/O coverage Geographical distribution Governance Institutional framework	Mapping entry points in value chains JIT TQM CI	Comparative analysis Product innovation Learning by doing
<i>Lawrence Edwards</i> Proposal: An analysis of the determinants of South African export performance	Lall Model of technology	Prices Industry concentration Input costs proxy for labour and capital Factor intensities FDI		Export share Dynamic panel estimation techniques



## Appendix 19: Description of Variables

Variables	Strategies	Description of variables
Technology	High tech technology applications Development of new products	Employ high tech production, distribution methods Investment in specialized technologies Modernisation of technology in manufacturing, information and communication for connectivity into the globalised environment Development of new products, cost effective manufacturing processes e.g. use of robots
Innovation	Information sharing R&D investment E-business systems	Knowledge sharing and learning on fast track basis Respond to changing consumer tastes R&D for continuous renewal Development of human capital to bring new ideas VA through innovation to differentiate products in the market Infusion of IT in management structures of firms and companies in the industry Communication networks that make it possible to coordinate and collaborate in real time eg internet connectivity which reduces transaction costs substantially E-business options that tames geography and time zones, market on international scale Branding gives an edge to investors
Policies	Liberalization Deregulation Incentive systems and structures Democratic political systems Legal and regulatory frameworks Governance systems and structures	Public sector: Government policies for overcoming the increasingly complex constraints and challenges involved in building and improving an export presence Deregulation, Legal and regulatory environment, systems for rules and norms-common law, religious, civil, socialists, mixed systems Government foreign policies Incentives structures Strategies Political systems and economic freedom Private property rights Socio-economic stability- that influences flow of FDI A country's policy orientation toward exports is the strongest variable for explaining why a country attracts FDI. Macroeconomic stability determinant of FDI inflows because of likely promise of future Democracies and political stability, and freedom of press are all associated with lower corruption Corruption affects accountability through institutions and level of provision of public goods which if competitive reduces corruption

<b>Variables</b>	<b>Strategies</b>	<b>Description of variables</b>
		Policy reversals Intervention measures to stimulate Electronic/electrical sector
	Clusters	Private sector: Firm level policies, management structures and logistics management Corporate social responsibility
Trade effects	Macroeconomic stability Poverty levels Planning, Time and quality management Market access and investment areas Business culture Market access	Regional integration Macro-indicators South-south regional cooperation Socioeconomic stability Determines level of consumption and the level of local and FDI Rich countries have better governments with potentials of generating higher capital outflows; ethno homogeneous countries have better governments Low corruption index is synonymous with stable governments Business Culture
	Tariffs and NTBs Networks VA	Markets Market access conditions- tariffs and NTBs, RoO Standards and technical regulations, waste management (though TBT standards are lacking in most cases) Private sector voluntary standards, codes and benchmarks Harmonization of rules and procedures across geographical borders Off shoring, outsourcing, global sourcing Value added chains Intra-industry investment and inter-product trade Integration into international production and supply networks Emerging market, BRICs Networks Divergence of participants (MNC, TNC, Born global, SMEs) Consumer protection against e-wastes compromises investment in certain regions Divergence of participants (MNC, TNC, Born global, SMEs) Regional integration and economic blocs (40% of global trade is under preferential trading arrangements) with countries integrating to expand mkt sizes, achieve economies of scale and enhance productivity;
	FDI flows Entry strategies	FDI/Private sector involvement Level of MNC/TNC involvement SME specialization in niche markets

<b>Variables</b>	<b>Strategies</b>	<b>Description of variables</b>
		<p>Born global participants</p> <p>Flexibility in supply capacities</p> <p>Integration into GVC</p> <p>Diversity of participants</p> <p>Entry strategies</p>
Moderating Factors	<p>ICT infrastructure</p> <p>Interactive Websites</p> <p>Subscription to international databases</p>	<p>Logistics</p> <p>Internet</p> <p>Websites and ICT platforms</p> <p>Logistics management</p> <p>Digitalisation, logistics e.g. DHL International</p>
		<p>Operational environment</p> <p>Business environment-security, corruption, legal environment, culture</p> <p>Legal and regulatory framework</p> <p>Politics</p> <p>Financial sector operations</p> <p>Financial service sectors – banking, insurance, stock markets,</p> <p>Transport infrastructure and logistics</p> <p>Political risk is a determinant of capital inflows with unable ones promising higher returns it is the main factor.</p> <p>Corporate governance</p> <p>Access to energy</p> <p>Access to ICT services</p> <p>Institutions</p> <p>Modernisation of technology in transportation facilitating diverse players in international trade within the globalised environment</p>
	Competitiveness proxies	<p>Networks-global and international</p> <p>Infrastructure</p> <p>FDI inflows</p> <p>E-commerce and e-business transactions</p> <p>Level of private sector involvement</p>

## Appendix 20: Sample EE Manufacturers and Facilitators

NAME	POSTAL ADDRESS	ROAD/ BUILDING	TOWN	WEBSITE/Email
Power Technics Ltd	P.O. BOX 49197 00100	Mombasa Rd Power Technics Complex	Nairobi City	<a href="http://www.powertechnics.com">www.powertechnics.com</a> <a href="mailto:info@powertechnics.com">info@powertechnics.com</a>
Eveready East Africa Ltd	P.O.BOX 44765-00100	Wabera Standard	Nairobi City	<a href="http://www.eveready.co.ke">www.eveready.co.ke</a> <a href="mailto:info@eveready.co.ke">info@eveready.co.ke</a>
Avery East Africa	30417-00100			<a href="mailto:endubi@averyafrica.com">endubi@averyafrica.com</a> <a href="http://www.averyafrica.com">www.averyafrica.com</a>
Nationwide Electricals industries Limited	P.O. Box 18525 – 00500	Industrial Area	Nairobi	<a href="http://www.nationwide.com">www.nationwide.com</a> <a href="mailto:nationwide@wananchi.com">nationwide@wananchi.com</a>
East Africa Cables Ltd	BOX 18243- 00500 NBI	Addis Ababa Rd	Nairobi City	<a href="http://www.ecable.com">www.ecable.com</a> <a href="mailto:infor@ecable.com">infor@ecable.com</a>
Metsec Cables Limited	P.O Box 75963-00200 Nairobi	Mombasa Road Doshi Complex	Nairobi City	<a href="http://www.doshigroup.com">www.doshigroup.com</a> metsec- <a href="mailto:accounts@doshigroup.com">accounts@doshigroup.com</a>
Mutstek EA Ltd	P.O. Box 1619-00606		Nairobi City	<a href="mailto:info@mustek.co.ke">info@mustek.co.ke</a> <a href="http://www.mustek.co.ke">www.mustek.co.ke</a>
ABB Ltd	P.O Box 39120-00623 Parklands			<a href="mailto:doreenmakandi113@yahoo.com">doreenmakandi113@yahoo.com</a> <a href="http://www.abb.com">www.abb.com</a>
Craftskills EA Limited	Box 57357- 00200 Nairobi	Moi Drive 5c-9	Nairobi City	<a href="http://www.craftskillseastafrica.com">www.craftskillseastafrica.com</a> <a href="mailto:simon@craftskillseastafrica.com">simon@craftskillseastafrica.com</a>
UNIGHIR Ltd	Box10049- 00400	Nairobi Industrial Area Road C Off Enterprise Rd Unighir Ltd	Nairobi City	<a href="http://www.unighir.com">www.unighir.com</a> <a href="mailto:info@unighir.com">info@unighir.com</a>
Kenya Power	30099 - 00100 Nairobi	CBD	Nairobi City	<a href="mailto:pnkimemia@yahoo.com">pnkimemia@yahoo.com</a> <a href="http://www.kplc.co.ke">www.kplc.co.ke</a>
ASSA ABLDY East Africa Limited	42837 - 00100 Nairobi			<a href="mailto:kenya@assaably-eastafrika.com">kenya@assaably-eastafrika.com</a> <a href="http://www.union-online.co.ke">www.union-online.co.ke</a>

Zahra Sign Systems Ltd	32184 - 00600 Ngara Rd	Industrial Area	Nairobi City	<a href="mailto:zss.nairobi@gmail.com">zss.nairobi@gmail.com</a> <a href="http://www.zahrasignsystems.com">www.zahrasignsystems.com</a>
Ministry of Industrialization	P.O. Box 30418-00100, Nairobi	CBD	Nairobi City	<a href="mailto:kirima2001@yahoo.com">kirima2001@yahoo.com</a>
Ministry of Trade	P.O. Box 43137-00100, Nairobi	CBD	Nairobi City	<a href="mailto:nkiama59@yahoo.com">nkiama59@yahoo.com</a>
Export Promotion Council	P.O. Box 40247-00100, Nairobi	CBD	Nairobi City	<a href="mailto:chiefexe@epc.or.ke">chiefexe@epc.or.ke</a>
Kenya Investment Authority	P.O. Box 55794-00200, Nairobi	CBD	Nairobi City	<a href="mailto:info@investmentkenya.com">info@investmentkenya.com</a>
Export Processing Zone Authority	P.O. Box 50562-00200, Nairobi	CBD	Nairobi City	<a href="mailto:info@epzakenya.com">info@epzakenya.com</a>
Kenya Private Sector Alliance	P.O. Box 3556-00100, Nairobi	CBD	Nairobi City	<a href="mailto:info@kepsa.or.ke">info@kepsa.or.ke</a>
Kenya Association of manufacturers	PO Box 30225 - 00100 GPO Nairobi	CBD	Nairobi City	<a href="mailto:info@kam.co.ke">info@kam.co.ke</a>