PERFORMANCE OF THE KENYAN CUT FLOWER EXPORTS; AN EMPIRICAL INVESTIGATION (1986-2018)

LOSEM LONAH CHEPOGHISHO

X51/80658/2015

A Research paper submitted to The School of Economics, University of Nairobi in partial fulfillment of the award of the Degree of Master of Arts in Economic Policy Management

October 2019

Declaration

This research paper is my original work and has never been presented for a degree award in any other University.

Signature……………………………………Date…………………………………

LOSEM LONAH CHEPOGHISHO

REG NO; X51/80658/2015

This research paper has been submitted for examination with my approval as University Supervisor.

Signature……………………………………Date…………………………………

DR. DANIEL ABALA

School of Economics, University of Nairobi

Dedication

I dedicate this work to my parents Mr. Simon Losem and Mrs. Pauline Losem for the sacrifices they both made to allow me to reach this level of education.

Acknowledgement

This work will not be complete without the assistance of various personalities. First, I am grateful to Almighty God for this far He Has brought me.

Secondly, I am greatly indebted to my supervisor, Dr. Daniel Abala whose instructions and guidance made this a great success.

I wish to express my profound gratitude to my family and friends for their material and immaterial support. Specifically, my regards go to my parent, my siblings, my friends Caroline, Irene and Veronica for their love and encouragement throughout my study. I would also like to thank Dr. Mboche for his unfailing support and reassurance.

Last, but not least, am grateful to the entire staff of the School of Economics, University of Nairobi, and to my classmates (class of 2015/2016) for their moral support.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
EPAs	Economic Partnership Agreements
EPC	Export Promotion Council
EPZ	Export Processing Zones
EU	European Union
FAO	Food and Agriculture Organization
FTA	Free Trade Area
GDP	Gross Domestic Product
HCDA	Horticultural Crops Directorate
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
KARLO	Kenya Agricultural and Livestock Research Organization
KEPHIS	Kenya Plant Health Inspectorate Service
KFC	Kenya Flower Council
KNBS	Kenya National Bureau of Statistics
MUB	Manufacturing Under Bond
OLS	Ordinary Least Square
PCPB	Pest Control Products Board
SAPs	Structural Adjustment Programs
SPS	Sanitary and Phytosanitary Standards
TBT	Technical Barriers to Trade
UAE	United Arab Emirates
US	United States

Abstract

Kenyan cut flower sector is leading among the horticultural exports. The sector is contributing significantly to economic growth through the creation of employment opportunities, foreign exchange earnings, and poverty eradication. Cut flower exports to major destinations continues to grow in volume and value. Several factors in the micro and macro environment have contributed to this performance. This study sought to examine the specific influence of foreign income, real exchange rates, inflation, transport costs, and trade liberalization on the volume of cut flower exports. The study used secondary time-series data for 33 years from 1986-2018. Cointegration analysis results promoted the use of Vector Error Correction Model. Pre-and post-diagnostic tests were used to ascertain the validity of the VECM results. Further ADF test was used to test for stationarity of variables as non-stationarity leads to spurious regression. The post-diagnostic tests conducted included normality and autocorrelation tests to ensure fitness and reliability of the model. The study found that the foreign income, real exchange, inflation, transport costs, and trade liberalization significantly influences the volume of cut flower exports in Kenya in the long run. The findings of the study recommend the adoption of government policies encouraging the expansion of foreign markets. These policies should encourage more branding and product differentiation, increased cargo space, and reduced freight charges. Additionally, the government should adopt policies geared towards the expansion of regional markets where the transport costs may be cheaper.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The agricultural sector holds a significant role in the Kenyan economy. The sector contributes to economic growth and development through the Gross Domestic Product (GDP). According to Food and Agriculture Organization (2019) report, the sector is directly responsible for approximately 26% of Kenyan GDP and 27% indirectly. The indirect contribution is through the backward interrelation with other sectors of the economy, such as the service industry. Furthermore, the industry contributes about 60% of the total export earnings (Food and Agriculture Organization, 2019). The horticultural sector is one of the six sectors of this industry and contributes to the growth and development of the economy through the eradication of poverty, foreign exchange earnings, and creation of job opportunities (Meme, 2015). According to the Kenya Flower Council (2017), it is the third highest foreign exchange earner where tea holds the first place and tourism second. These benefits emphasize the importance of evaluating the performance of the sector.

The horticulture industry in Kenya mainly comprises of fruits, vegetables, and cut flower production. These horticultural exports contribute about 1.44 % of the total Kenyan GDP (FA0, 2019). Out of this, cut flower exports contribute about 1% of Kenyan GDP (Kenya Flower Council, 2018). According to Horticultural Crops Directorate Authority (2018), the flower industry in Kenya has experienced a significant growth for the past ten years. Kenya continues to hold a leading position among flower exporters to the European Union (EU) market with a share of approximately 38%. According to Kenya Flower Council (2018), approximately half of Kenyan cut flower exports take place through the Dutch Auctions and the other half through direct sales.

The value of horticulture exports continues to exhibit an upward trend. This is evidenced by a 33.3 % increase in earnings to Ksh 153.7 billion in 2018 from Ksh 115.3 in 2017 (Republic of Kenya, KNBS, 2019). This was a result of an increase in production and an improvement in the global prices. 75.3% of the value of horticultural exports in year 2019 were cut flowers (Republic of Kenya, KNBS,2019). The tremendous improvement in exports was as a result of compliance to

the EU market requirement by a majority of exporters. In addition, better prices by importing countries such as Germany, Australia, UAE, UK and Norway explained the increase. This is indicated in figure1, which shows cut flower exports as a percentage of total horticultural exports in Kenya for the year 2018.

Figure 1: Cut Flower Exports in Kenya for Year 2018
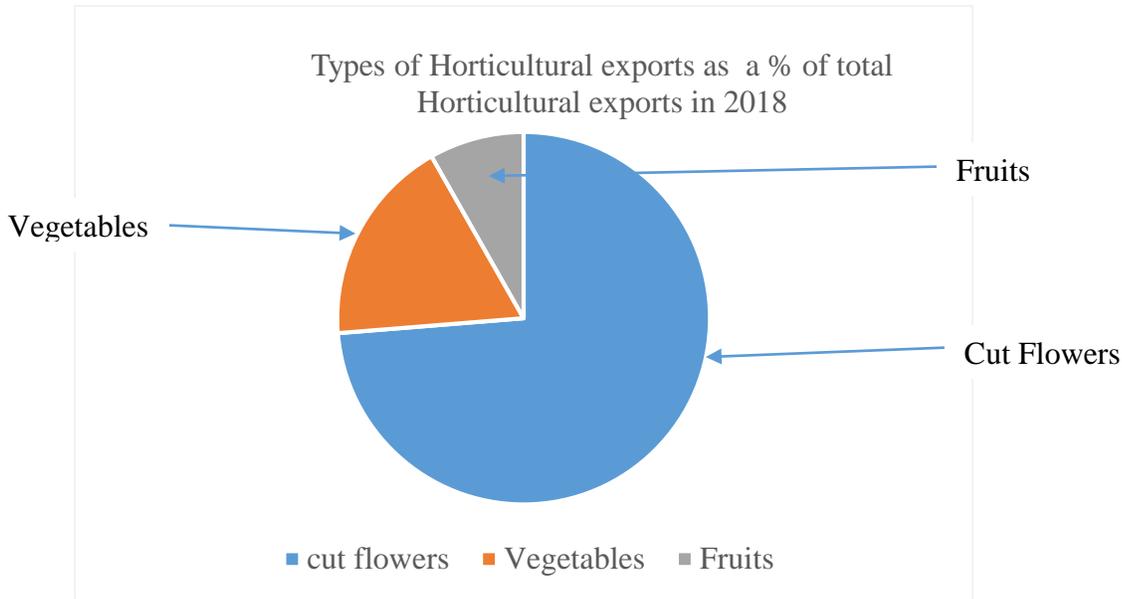
Source: Republic of Kenya, 2019, KNBS

According to Kenya Flower Council (2018), there are 110 varieties of flowers farmed in Kenya. Out of the 110 varieties the most popular are roses, carnations and alstroemeria accounting for 85.6%, 2.5% and 0.73% respectively. These flowers are mainly grown in the following counties; Nakuru, Nyandarua, Nyeri, Machakos, Nairobi, Kajiado, Meru, Transnzoia, Kiambu, Kericho and Uasin Gishu (Kenya Flower Council, 2017). The listed counties practice floriculture due to existence of favorable climate and soils. Flowers do well in high attitude area with warm climate.

For the past 10 years, Kenya has taken a lead position as an exporter of cut flowers in the international market overtaking traditional producers such as; Ecuador, Colombia and Israel (Kenya Flower council, 2018). The major export destination for the cut flowers in Kenya includes; European Union, China, Ecuador and South Africa. The European Union is the lead export

destination because approximately 800 Million stems are old auction in Holland and this is about 50% of the total flower production in Kenya (Kenya flower council, 2018). According to Muhammad et al., (2013), the export market is operated by over 150 flower producers in Kenya. Their scale of operation varies from medium to large scale and they export almost throughout the year.

1.1.1 Evolution of Cut Flower Farming in Kenya

Horticulture Business in Kenya dates back to the period between 1895 and 1920 (Hill, (1956). This is the period when Kenya was declared a British protectorate and later a colony respectively. The activities were necessary for Kenya to be able to contribute to the East African budget. According to Minot and Ngigi (2004), horticulture farming started with fruits as the colonist settlers started experimenting with various tropical fruits in 1901 in the coastal region at the currently Matuga Agricultural Research Station. According to Minot and Ngigi (2004), the second experimentation site was started in 1920 in Thika. The main objective of experimentation was to increase the scale of production. In the 1930's passion fruit juice became the first export in Kenya followed by pineapples in the 1950s.

Later on, vegetable farming was introduced by the Indians who were constructing the Kenya- Uganda railway. Additionally, 1950s period witnessed the first air shipment of high value fresh products facilitated by the Horticulture Co-operative Union (HCU). HCU, currently known as Agricultural Society of Kenya, was formed by the white settlers with the main aim of offering marketing services to European growers in Kenya. The produce were taken to hotels and high-class stores. According to Harris and Muthungu (1992), the major export in the 1950s was pineapples. Flower farming in Kenya started in 1969 along Lake Naivasha. This was started by a Denmark firm with the aim of exporting to Europe. For some period before early 1970s, the cut flower export volume was insignificant.

Before independence, the value and volume of horticultural commodities was low. However, in the late 1960s, the horticultural exports expanded immensely in terms of both value and the volume (Schapiro and Wainaina, 1991; Jaffee, 1995). This can be attributed to formation of Horticultural Crop Development Authority (HCDA) in 1967 and diversification of export products. HCDA focus was supporting horticultural trade through provision of information on

marketing of horticultural crops as well as price setting and regulation. Furthermore, apart from fruits, Kenya expanded its fresh produce exports to include cut flowers, carrots, tomatoes. The increase in freight cargo space and number of exporters in 1970's led to a great expansion of fresh produce exports.

By the year 1980, horticultural exports expanded greatly leading to an increase in foreign exchange. This was attributed to growth of Kenyan tourism sector, participation of small-scale farmers and increase in supermarkets in Europe (Harris and Muthungu, 1992; Minot and Ngigi, 2004). Before this period, the smallholders produced about 10-20 percent of the export volume. However, according to Minot and Ngigi (2004), this increased in the mid 1980's as there were approximately 13-16 thousand smallholders who were growing fresh produce. Furthermore, the market share for fresh fruits and vegetables by supermarkets has also increased as most supermarket chains wanted to deal directly with exporters. For instance, 33% of the total vegetable exports to United Kingdom in 1989 were sold through the supermarket channel (Minot and Ngigi, 2004). Supermarkets in Europe served as a major export destination of horticultural exports from Kenya. Apart from serving as markets for produce, the supermarkets helped in imposition of restrictions and quality control (Minot and Ngigi, 2004).

From 1990s, there was a breakthrough in the international market accessibility for Kenya's cut flower. The adoption of trade policies encouraging lower restrictions and regulation fostered this success. The signing of the World Trade Organization (WTO) and Economic Partnership Agreements encouraged lower tariffs barriers and regulations. It was easy to export cut flowers to European Union after the introduction of duty-free policy. Furthermore, the increased participation of the government in the cut flower exports through the Ministry of Agriculture contributed greatly to cut flower export performance through increased production, accessibility to quality and affordable farm inputs and improvement in adherence to international standards and requirements.

Currently, the Kenyan Government through Ministry of Agriculture is committed to increasing productivity, commercialization and competitiveness of agricultural commodities and enterprises (Republic of Kenya, 2018). This is executed under Horticultural Crops Directorate Authority (HCDA) and other government and private sector bodies. In the private sector, HCDA collaborates with Kenya Flower Council (KFC) whereas government bodies include; Kenya Plant

Health Inspectorate Service (KEPHIS), Pest Control Products Board (PCPB) and Kenya Agricultural and Livestock Research Organization (KARLO) are involved (Republic of Kenya, 2018). These bodies ensure efficiency and effectiveness in the horticultural sector through coordination of activities. However, more progress can be achieved if the private bodies such as KFC collaborates with the national and county government

1.1.2 Kenya's Cut Flowers Export Trends

Cut flower exports in Kenya exhibits various trends. These trends are seen in three eras; i.e. pre-liberalization, liberalization and post liberalization era. For this study, the pre-liberalization era is between 1975 and 1985, liberalization era is from 1986 to 2002 and post liberalization is from 2003 to 2018. The trends show how Kenyan cut flower exports behaved in the different trade policy regimes. Additionally, the trends depict the growth of the cut flower exports in Kenya during the different trade policy regimes.

The main trade policy in the pre-liberalization era was import substitution where goods and service were produced locally with the aim of replacing foreign imports. The main feature of this era was government intervention through provision of direct support and tariff protection for the industrial sector. This led to many trade barriers in form of custom duties, license requirement and quantity regulation (World Bank, 2007). Exportation of cut flower started to gain momentum in 1971 in terms of volume. This was a result of increase in cargo space and number of exporters. However, the sector faced challenges in form poor infrastructure, adverse climate conditions, weak macroeconomic environment and this affected performance of cut flower exports.

Under the liberalization era (1986-2002), cut flower exports started to increase. This was due to adoption of better trade policies favoring the export of cut flowers to other regions. The main trade policies in this era were anchored on the WTO requirements. These requirements prompted Kenya to adopt a new strategy i.e. Structural Adjustment Programs (SAPs). The reforms under SAPs included replacement of quotas by tariffs and lowering of duties on industrial inputs and final products (Republic of Kenya, 1986). Their main aim was to; curb the inefficiencies of the import substitution policy, prevailing budget constraints and pressure from multi-lateral financial institutions. The government was dedicated to liberalizing the economy as well as embrace outward-looking policies for development strategy (World Bank, 1993). This had ripple

effects in most sectors of the economy including floriculture industry. The government through the Ministry of Agriculture formed the Horticultural Crops Directorate Authority to handle policy matters in relation to all horticultural crops. It is through this body that liberalization policies such as export promotion programs, export duty and VAT exempt, tariff reductions and elimination of bureaucracy in licensing were achieved in floriculture business. This openness has improved the ease of doing business in the industry.

More progress in volume and value of exports in cut flower has been achieved in the post liberalization era. The trade policies in this era are guided by Vision 2030 and National Trade Policy. Production in this era is export oriented hence goods and services are mainly produced to be sold in international markets. A lot of emphasis is laid on free trade i.e. minimal or no barriers to trade. In the vision 2030 blueprint, the government is committed to boost agricultural sector earning through improving the demand of agricultural products especially in the international market (Republic of Kenya, KNBS, 2017). Cut flower exports in this era have been increasing where according to the Horticultural Crops Development Authority (HCDA) statistics of 2017, horticulture exports improved by 13.6 % in value in year 2017 to Ksh. 115.3 billion. Out of this 115.3 billion, 71.3 % were cut flowers. This was as a result of a 19.7% increase in volumes of exports. The table 1 and figure 2 shows the trend in Cut flower production in Kenya for a period of 33 years. Table 1 and figure 2 clearly shows the cut flower exports trends from 1986 to 2018.

Table 1: Kenyan Cut Flower Exports Trends from 1986 to 2018

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Value of cut flower(Billion Ksh)	0.03	0.05	0.09	0.08	0.16	0.19	1.25	2.48	2.64	3.64	4.37
Volume of cut flowers in '000' tonnes	6.20	10.95	15.10	13.29	18.88	16.93	19.81	23.64	25.12	29.37	35.21

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Value of cut flower(Billion Ksh)	4.90	5.91	7.23	7.27	10.62	14.79	16.50	18.72	22.90	23.60	43.10
Volume of cut flowers in '000' tonnes	35.85	30.22	36.99	38.76	41.40	52.11	60.98	70.70	81.20	86.50	91.20

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Value of cut flower(Billion Ksh)	39.80	30.80	35.60	58.80	65.00	56.00	59.90	62.90	70.80	82.20	113.20
Volume of cut flowers in '000' tonnes	93.70	87.00	120.20	110.00	108.30	105.60	114.80	122.80	133.70	160.00	161.20

Source: Republic of Kenya, 2018, KNBS

Figure 2: Kenyan Cut Flower Exports Trends from 1986 to 2018

Value and Volume of Cut flower Exports In Kenya from 1986 -2018
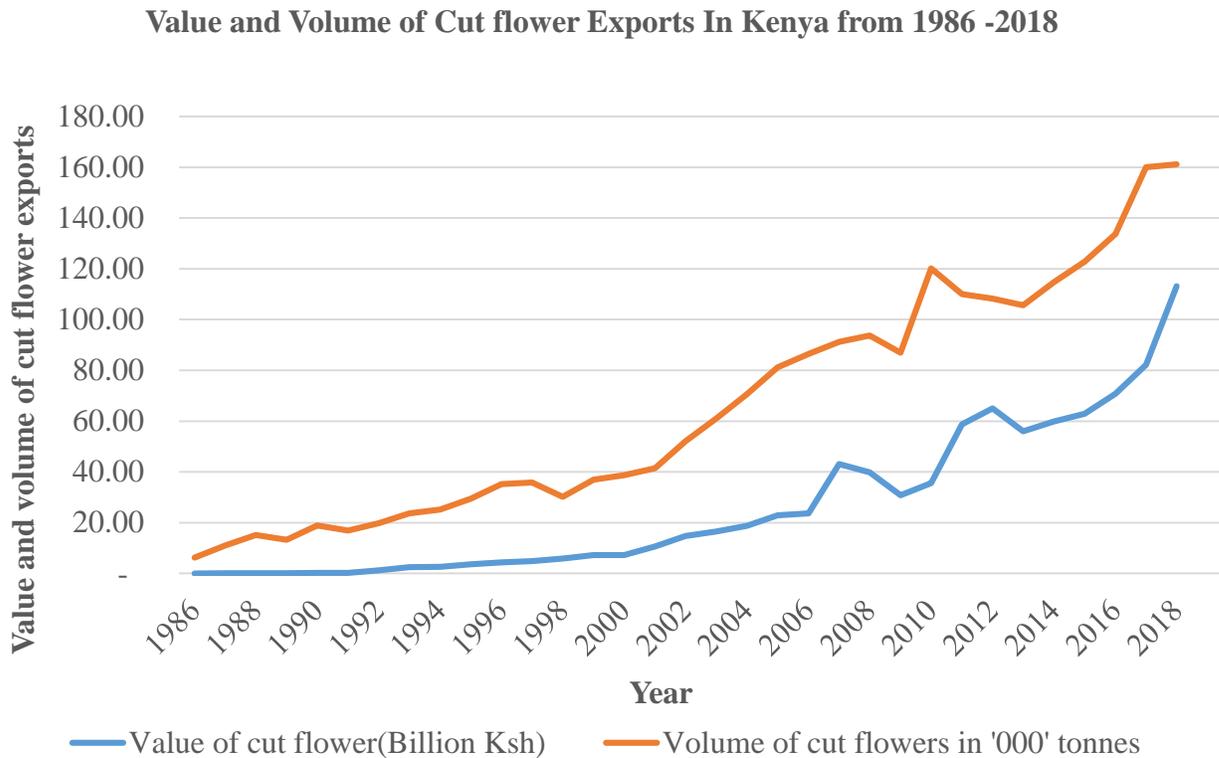
Source: Republic of Kenya, 2018, KNBS

Table 1 and figure 2 clearly shows the volume and value of cut flower exports have been increasing since 1986. However, the increase in volume of cut flowers exports has been higher than the increase in value. The average value of cut flower exported since 1986 is Ksh. 38 billion and the average volume is 88.3 metric tonnes. The continuous increase in cut flower exports can be attributed to adoption of favorable; government policies, macroeconomic environment and climate. In particular, the continuous growth in value of exports can also be attributed to; reduction in tariff charges, creation of HCD, increase in cargo space efficient input supply, extensive export development programmes by the Export Promotion Council (EPC), improved post-harvest handling and development of marketing infrastructure (Republic of Kenya). Figure 2 can be explained in three phases i.e phase I (1997- 2006), phase II (2007-2013) and phase III (2014-2018).

Cut flower exports in the period from 1986 to 2006, had a steady trend i.e there were minimal fluctuations. Between 1997 and 1999, the value cut flower exports rose steadily despite fluctuations in the volume. For example, in 1998 the exports recorded a 48.8 % growth (Republic

of Kenya, 1999). This growth was almost double the previous year and was as a result of improvement in packaging of cut flowers, direct sales and depreciation of Kenyan currency against international currencies. This was in spite of decrease in flower production due to unfavorable weather conditions, poor infrastructure and port congestion (Republic of Kenya, 2002).

From 2007 to 2013, cut flower exports in Kenya experienced significant fluctuations in terms of both value and volume. This can be attributed to the adverse multiple shocks in the economy. These shocks included the hostile political environment, adverse weather conditions, high oil prices and global financial and economic crisis (Republic of Kenya). The post-election violence after the 2007 general election affected volume of flowers exported in 2007 and 2008 as major production areas i.e Naivasha and Nakuru were inaccessible. Additionally, the unfavorable weather condition in terms of drought negatively affected flower production. Furthermore, high international oil prices increased the production cost in terms of electricity and transportation in the face of global financial and economic crisis thereby reducing economic activities (Republic of Kenya, 2013).

Between 2014 and 2018, the performance of cut flower exports improved in terms of value and volume. This was as a result of favorable climatic condition, better macroeconomic environment and recovery from the global and economic crises. For example, the reduction in inflation rates leading to low energy cost (Republic of Kenya, 2016). Additionally, the exploitation of opportunities existing in the various trade agreement such as the EAC, AGOA and IGAD contributes to this trend. For example, formation of EPAs through EAC permitting export of cut flowers to the EU duty free. Additionally, the introduction of direct flights to major export destination such as the US increases accessibility and reduced on cost.

1.1.3 Contribution of Cut Flowers to the Kenyan economy

Cut flower exports plays a significant part in the growth and development of Kenyan Economy. This is mainly through creation of employment, eradication of poverty and foreign exchange earnings. An export-oriented economy creates job opportunity where various industries utilize the available labor market in production of goods and services. This leads to increase in the disposable income for the labor market hence reducing their poverty levels. Additionally, exports lead to   foreign exchange earnings which build on foreign reserve. The foreign reserve is used by

the government in payment of imports without incurring currency exchange costs. Moreover, promotion of exports generates government revenue through tax revenue and this is used in development projects.

Cut flowers export business is among the lead source of foreign currency in Kenya besides tourism and tea. This is mainly through 100 exporter firms located in different parts of the country (Ksoll, 2014). The industry in Kenya is quite vibrant contributing about 1% of total GDP and is recognized as one of the quickest growing sectors in the agricultural industry. This growth is in favor of Kenya's Vision 2030 blueprint that aims at sustainability of the agriculture sector focusing at 10 % contribution to the country's GDP. The sub- sectors in the agricultural sector must grow to ensure the goal is achieved. According to Kenya Flower Council (2018), Kenya's floriculture sub-sector has been contributing to this growth.

Floriculture industry provides an opportunity for both formal and informal employment. The sector is among the top providers of employment opportunities in the country. According to Kenya Flower Council (2018), the sector provides both formal and informal employment to approximately half a million people directly and more than six million people indirectly. The indirect employment is normally in transport and packaging sector whereas the direct employment is in the flower farms and private flower businesses. Moreover, several individuals have identified self-employment opportunities in the flower market through joining the local and regional market. Some individuals retail flowers in local markets e.g. city market in Nairobi while others export directly to other countries. The industry also leads to other forms of employment through multiplier effect e.g. development of paper manufacturing industries to offer packaging materials for the flowers (Ongeri, 2014).

Moreover, the industry is pivotal is eradication of poverty in the country. This is through creation of employment thereby increasing household's disposal income as well as through government development projects supported through tax revenue. The households use the disposable income in providing for their basic needs as well as in their development project. The industry also leads to improvement in citizens standards of living through government expenditure in form of development projects. Most of the areas where floriculture is practiced requires good infrastructure in terms of roads, electricity and communication networks. Therefore, the

government is keen to ensure the areas are accessible to ensure continued economic growth through tax revenue and foreign exchange earnings.

1.2 Statement of the problem

The vibrancy of the flower industry has continued for the past ten years thereby benefiting the economy greatly in terms of creation of employment, reduction in poverty, foreign exchange earnings among others. Currently, Kenya has a leading position in the export of flower exports to European Union. Over 90 percent of flowers produced in the country are mainly exported to the EU markets, with the rest shared between the domestic and regional markets.

This industry if well-structured could highly contribute to economic growth in Kenya. However, it is faced by various challenges such as; flower brokers, crisis in fertilizer importation, unfavorable transport system, increase in input taxes, tax refunds delays, strict phytosanitary demand in the European Union,new requirement on decontamination by Australia and the escalating competition from new flower producers in Africa such as Ethiopia, Rwanda, Uganda and Tanzania. There is need to tap into available market opportunities in US and China. The introduction of direct flights to US can contribute into expansion of volume of cut flowers exported whereas the improved relationship between Kenya and China could be used to expand the market for cut flowers. Furthermore, the broker problem through auctions decreases the visibility of Kenyan cut flower. These challenges negatively influence the performance of cut flowers.

Recent studies on the competitiveness of Kenyan cut flowers exhibits some gaps. Such studies include Bartilol et al. (2019) and Moriasi et al, (2014). These studies have been specific to certain regions i.e. Nakuru County and European Union. This study seeks to expound on the previous research by using the most current data while focusing on cut flower exports in the Kenya instead of specific counties.

1.3 Research Questions

The research questions for this study include:

  i.   What are the internal and external factors that influence the quantity of cut flower exports in Kenya?
 ii.   What is the relationship between the quantity of Kenyan cut flowers and other factors in domestic and foreign economies?

iii.   What are the trade policy recommendations that can be drawn to increase the growth of cut flower exports in Kenya?

1.4 Objectives of the study

The paper will focus on the following general and specific objectives.

1.4.1 General Objective

Generally, the study seeks to investigate the main determinants of the Kenyan cut flower exports and establish ways to improve them so as to increase their contribution to economic growth.

1.4.2 Specific objective

Specifically, the paper will seek to;

i.   Establish the main factors influencing the quantity of Kenyan cut flower exports

ii.   Determine the responsiveness of cut flower exports to changes in the identified factors

iii.   Recommend policies to improve the floriculture export sub-sector based on the finding of the research

1.5 Contribution of the study

The study is important since it analyses the factors affecting performance of cut flower exports in Kenya. It provides vital information for different stakeholders in the flower exports business. These stakeholders include; the government, the flower producers, policy makers and researchers. The study provides insights for policy makers while adopting trade policies to boost flower exports as well as provides background information useful in trade negotiations with WTO, IGAD. The study will provide a review of Kenya's previous cut flower export performance as well as provide a review of other countries experience on the same. The research findings will provide insights on the true position of cut flower exports performance in Kenya.

1.6 Scope of the study

The paper aim at establishing the main factors influencing the cut flower exports in Kenya. Secondary time series data for 33 years from 1986 to 2018 will be used. During this period Kenyan cut flower exports sub-sector had a steady trend with minimal fluctuations. It was also in 1986 that the liberalization era began where better trade policies favoring the export of cut flowers to other regions were adopted. The main trade policies in this era were anchored on the WTO requirements. These requirements prompted Kenya to adopt a new strategy i.e. Structural

Adjustment Programs (SAPs). The reforms under SAPs included replacement of quotas by tariffs and lowering of duties on industrial inputs and final products (Republic of Kenya, 1986)

1.7 Organization of the study

Following the introduction, the next section will cover literature review which is sub-divided into three sections i.e. theoretical, empirical and an overview of the literature review. This will be then be followed by methodology which covers theoretical structure, empirical model, variables definition, diagnostic tests as well as types and sources of data. The next chapter discusses the model estimation, data properties and tests. Finally, the last section of the paper will cover the research findings, conclusions and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter covers three parts namely; Theoretical review, Empirical review and the literature overview. The first part is on theoretical literature which discusses the various factors relating to export performance. Particularly, the section will elaborate the various factors affecting the performance of the cut flower export market. The empirical literature review section will cover the different studies conducted on the area. Finally, the overview of the literature will explain the relevance of the study and gaps to be addressed from the previous studies.

2.1 Theoretical Literature Review

The agricultural sector is a major pillar for the Kenyan Economy through its contribution to GDP. Compared to other economies, Kenya has a comparative advantage in this sector. This is in terms of favorable climate, arable land and availability of cheap labor. Specifically, floriculture industry enjoys this comparative advantage as flower farming is labor intensive and thrives in warm climate. Recently, the floriculture industry has gained momentum in terms of foreign exchange gains, creation of job opportunities and alleviation of poverty exports (Meme, 2015). Additionally, a study conducted by Bartilol et al., (2019) identified Kenya as a major exporter of cut flowers products to the EU markets. The authors recognized horticulture as one of the leading farming activities in Kenya and floriculture as the fastest growing subsector of this industry. Furthermore, they identified European union as the largest market for Kenya's horticulture products where the demand in this market was largely dependent on market share effect. Therefore, it is important to establish the progress of the cut flower exports in terms of performance in the international markets.

A number of studies have already been conducted to investigate the performance of horticultural exports in Kenya and other countries. Studies have shown that the performance of horticultural exports is affected by both microeconomic and macroeconomic factors. Some of these factors include; foreign income, real exchange rate, interest rates, transport cost, inflation, volume, trade policy changes, phytosanitary requirements etc. For example, Ikara (1992) in his paper on determinants of horticultural exports expounded on the various challenges faced by horticulture

products exporters. These challenges encompassed air-cargo space, high packaging cost, lack of proper handling, precooling and cold storage facilities, high cost of production, high competition from the other horticultural producers and the seasonality of foreign demand (Ikiara.1992).

The importing country GDP or foreign income also plays a significant role in performance of the exports. This is because it influences the demand for the cut flowers exports. Meme (2015) considered the GDP of Five major importers of the Kenya's horticultural produce ie UK, Germany, Netherlands, France and Belgium while studying the performance of Kenyan Horticultural exports. This is referred to foreign income and it measures the income elasticity of cut flower exports. Meme (2015) work is similar to other researchers such Rono et al., (2018); Moriasi et al., (2014); Nguyen (2014) and Torayeh (2013). For example, Nguyen (2014) considered foreign as a key determinant of Vietnam's export. The relationship between Vietnam's export and GDP of foreign countries was highly significant.

Additionally, Rono et al., (2018), advocated for consideration of the exchange rate volatility, volume of exports, inflation, changes in balance of payments and government debt payment trends when looking for export markets. According to them, this was a necessary step to be considered by firms looking into exporting flowers to foreign markets. The authors also noted the two inflation rate factors i.e purchasing power and government securities issue affected the export earnings of the Kenya flowers tremendously through increasing inflation. Additionally, the authors considered foreign capital flows as a factor affecting export earnings in the Kenyan cut flower export business.

The international competitiveness of Kenyan cut flowers is affected by activities along the supply chain (Moriasi et al, 2014). According to the authors, horticulture has recently expanded to become a key foreign exchange earner thereby contributing to growth of the economy. These activities along the include; key players in the supply chain, the physical distance, regulations and international standards. Similar to this, Nyairo and Backman (2009) argue the price of agricultural inputs also affects the agricultural productivity. This can be considered an activity along the supply chain. The authors argue that a rise in price of agricultural inputs negatively affects agricultural output in East African region. The authors advocated for sufficient use of seeds, pesticides, fertilizers, and other inputs so as to realize high yields.

A study on the analysis of Kenya's export performance conducted by Were et al. (2009) acknowledged exports were affected by change in trade policies. The authors argue that the change in trade policies such as adoption of trade liberalization through the various trade agreements affects the performance of Kenyan exports, cut flowers included. Through an analysis of the different trade policies, the authors found out that removal of tariffs and non-tariff barriers positively influenced Kenyan exports. The effects were from changes in prices and accessibility to markets thereby increasing demand for exports. Their study focused on how certain trade agreements such as the Economic Partnership Arrangements (EPAs) in the European Union influenced performance of Kenya exports. Gbetnkom and Khan (2002) study supports this school of thought. According to the authors, domestic policies affects agricultural exports. The domestic policies can be in form of government intervention, taxes and adoption of SAPs. The policies alters the market price for exports thereby affecting demand.

Similarly, Torayeh (2013) while investigating the competitiveness of agricultural exports in the EU considered trade policy a factor affecting the performance of exports in Egypt. According to Torayeh (2013) the prevailing trade policies in Egypt between 1998 and 2014 remarkably impacted on the competitiveness of most agricultural exports (EAE) to the European Union. Factors such as non-tariff barriers, standards of the product, technical regulations and requirements by the importing country greatly influenced the performance of vegetables and fruits exported to the EU market. The same case was seen in the study of determinants of Vietnam's export by Nguyen (2014). The author included free trade agreements in the model to determine how it influenced the total exports in Vietnam.

Furthermore, the distance between the exporting country and importing/foreign market affects the performance of exports. Orindi (2010) used distant as a proxy for transport costs while studying the determinants of Kenyan exports. The implication of this was that the longer the distant from the Nairobi to the importing country, the higher the transportation costs leading to lower demand for the exports. Additionally, distance determines the handling of the cut flowers in terms of special storage facility to avoid perishability. This is an added cost that affects the demand and supply of cut flowers. According to Nyugen (2014), the distance between Vietnam and the importing partners had a great effect on the perform of the exports.

2.2 Empirical Literature Review

Several authors have conducted studies on performance of horticultural exports. Some studies have majored on the general performance of the horticultural sector while others concentrated on specific sectors of the industry i.e fruits, vegetables and cut flowers. These studies have been done in various parts of the world, Kenya included. The aim focus of the studies has been to identify the specific factors hindering or encouraging the growth of horticultural exports. By doing so, the authors have identified solution or recommendation to an impeding problem or given policy recommendation for improvement. Some of these authors include; Bartilol et al., (2019), Rono et al (2018), Navazeni and Khomeini (2016), Meme (2015), Moriasi et al. (2014), Orindi (2010), Kumar et al. (2008), Gbetnkom and Khan (2002).

Using a Constant Market Share approach, Bartilol et al (2019) investigated factors hindering growth of exports in the European Union market. The authors used time series data for the years 2001 to 2014. The absence of export growth was attributed to commodity composition effect since the market distribution effect showed that export products did not attain much compared to the other expanding global markets. The research explores at length the market shares and lack of export growth of Kenya's cut flower exports to the European Union market using a shift share/Constant Market Share (CMS) Analysis method. The method is used to decompose the changes in export value. It can also be used as a descriptive or a diagnostic tool for primary analysis. The CMS methodology is based on the postulation that a country's place in global markets should be invariable.

According to a study conducted by Gbetnkom and Khan (2002), Cameroon's supply agricultural exports i.e bananas, coffee and cocoa are affected by factors such as policy change, relative prices, infrastructure, climate and financial support accessibility. Using 1971 to 1996 data and OLS estimation, the study found a direct relationship between relative prices in the international market and the supply of agricultural product. However, this relationship was fairly significant. Additionally, the study findings suggested a positive relationship between supply of this exports and easy accessibility to credit, policy change and development in infrastructure. This meant that more credit for the crop exporters increased the supply of the crop. The authors used Structural Adjustment Programs (SAPs) dummy variable to measure the effects of policy change on the supply of the three agricultural crops.

16

To explore the determinants of the Kenyan exports, Orindi (2010) analyzed total exports value against distant, importers GDP and population. Using secondary data and OLS estimation method, the author confirmed the expected theoretical results i.e a positive relationship between exports and population, foreign income and a negative relationship with distant. Though a positive correlation between, population was established, this relationship was found to be insignificant in the model, hence dropped. Additionally, the study established an inverse relationship between distance and exports at 95% confidence interval. Similarly, Salasya (1989), in a study on analysis of factors that influence export of Kenyan French beans used linear regression to determine the effects of price and air freight charges on the export of French beans. The regression results exhibited a positive relationship between price and exports of French beans. However, this relationship was found to be insignificant at 5% significance level. The author found an inverse relationship between the air-freight and export at 5% significance level.

Moriasi et al (2014), analyzed the factors affecting the international competitiveness of Nakuru County cut flower exports. The authors used questionnaire for data collection. The data was then analyzed using descriptive statistics. This information was presented in tables and charts. From the analysis, the study concluded that activities along the supply affected the performance of Kenyan Cut flowers in international market. These activities included; ability to manage the different actors along the supply chain, the physical distance, regulations and requirements, international standards. According to the authors, the physical distance affects the competitiveness of the cut flowers through cost of transportation. Cut flowers are sensitive in terms of their perishability hence the need for special storage as well as speed in transportation to the intended markets.

In order to retain and expand the market share in the international market, Moriasi et al (2014) recommended development of systems to identify actors in the cut flower supply chain in terms of their locations and roles in the transmission of both the supplies and goods. This would improve on the speed of transmission and commitment. Additionally, the authors recommended a review of the regulations and restrictions to favor cut flower exports. Finally, they recommended the involvement of organizations such as the Kenya Flower Council in reducing the cost of the inconsistent and unpredictable international standards.

Navazeni and Khomeini (2016) investigated the factors affecting development of export performance of small and medium entrepreneur companies and more so the dried fruit exporting companies of Tehran Province in Iran. The authors focused on the effects of the entrepreneurial attitude of managers on the export performance. They achieved this objective through a descriptive analysis approach that used field survey method. The questionnaire used to collect data focused on three areas i.e exports, organizational learning, innovation and entrepreneurship. This data was examined using Partial Least Square (PLS) regression software. The study concluded that there was a connection between export performance of entrepreneurship, organizational learning and innovation.

Kumar et al. (2008) conducted a study on the export of gherkin and cucumber in India. The author estimated the factors affecting cucumber and gherkin exports using a log linear demand function. The world volume of internationally traded cucumber and gherkin products and the exchange rate were found to be significant. According to the study, the world traded volume of these commodities was used to capture the change in international demand for these products. Therefore, an increase in this variable was expected to lead to an increase in the quantity of exports of cucumber and gherkin products from India. Both coefficients were positive and significant. The regression results indicated that a rise in international demand leads to a rise in exports of the same products from India. Moreover, the positivity of real exchange rate coefficient implied that real exchange rate depreciation led to an increase in the exports of these commodities.

Earnings in Kenyan flower exports are affected by various factors. According to by Rono et al. (2018) study, flower export earnings in Kenya are influenced by exchange rates, inflation rates, foreign capital flows and volume. A regression analysis on Secondary data between 2011 and 2015 was used to examine the specific effects of the explanatory variables on the flower exports in Kenya. The research finding concluded there was a direct relationship between independent variable and the explanatory variables. Specifically, Inflation was found to greatly influence the earning with a coefficient of 0.664, followed by volume, volatility of exchange rate and foreign capital respectively. The two exchange rate changes factors noticeably balance of payments and government debt payment affected the export earnings of flowers. It was established that the inflation rate affected the export earnings for the Kenya flowers.

Ikiara (1992) while studying the determinants of export performance of the Kenyan horticultural industry sought to establish the statistical effects of the various challenges experienced in the horticultural sector. The author considered these challenges a threat to growth and expansion of the industry. Using a semi-log-linear econometric model and Ordinary Least Squares (OLS) estimation, Ikiara (1992) analyzed the relationship between export performance of Kenya's horticultural industry and foreign income, availability of cargo space and real exchange rate. The author also conducted diagnostic tests to verify the reliability of the estimated model. The research findings concluded that foreign GDP, availability of cargo space in air transport and the rate of real exchange positively influenced volume of horticultural exports.

Meme (2015) while investigating the performance of the Kenyan horticultural expounded on Ikiara (1992) work. Secondary time series data for the year 1984 to 2014 was used to investigate the relationship between horticultural exports and real exchange rate, agricultural GDP, real interest rate and foreign income. The data was collected from the various Economic Survey and Statistical Abstract from Kenya government institutions and the World Bank. The error correction analysis results showed that real exchange rate, agricultural GDP and real interest rate significantly influenced horticultural exports. The explanatory variables foreign GDP, real exchange rate, and Agricultural output were found to have a positive relationship with exports whereas Interest rate had a negative relationship. Unlike real exchange rate, interest rate and agricultural GDP, foreign income was found to be statistically insignificant hence not a viable model estimator.

2.3 Overview of the Literature Review

A review of the existing literature points out the research gap. For instance, though the studies conducted have explored the impact of trade policies on competitiveness of exports, there is need to focus on the effects of non-tariff barriers that don't relate to changes in price. A new research into the relationship between performance of cut flowers and non-tariff barriers such as phytosanitary requirements by the importing countries can be conducted. This will address the lost business due to non-compliance to the set regulations. Additionally, it will also address the associated cost of meeting the storage requirements.

Additionally, some studies such as; Meme (2015) and Orindi (2010) found insignificant results for some explanatory variables. Meme (2015) found out that foreign income was

statistically insignificant whereas Orindi (2010) concluded price was not statistically significant. This calls for more investigation since the two explanatory variables are key elements in determining the performance of horticultural exports.

Furthermore, following Orindi (2010), there is need to take advantage of the neighboring markets. This study revealed that exports to the neighboring countries were less than exports to countries like USA and Europe. This implied other factors apart from distance influenced performance of horticultural exports to neighboring countries. These other factors included; income, trade agreements, and similar comparative advantages. For example, the exports from Kenya to countries such as Somalia, Southern Sudan and Ethiopia were few which could be as a result of poor infrastructure, similarities in climate and output. This calls for the need to address this shortcoming by adopting product differentiation technique.

Furthermore, from Ikiara (1992) study, there is need for further research to quantify the statistical significance of the said factors that influence exports of the horticultural products This calls for an empirical analysis to investigate the current specific effects of cargo space, foreign income, volume and real exchange rate. This will guide on ways in which to exploit the available opportunity especially with the direct flights to US and China. Additionally, the study will look into new data hence the effects may change with time

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The following chapter covers the theoretical structure/framework, empirical/experimental model, as well as data type and sources. The theoretical framework discusses the factors affecting cut flower exports from the demand and supply side. The empirical model specifies the factors to be analyzed. Both theoretical framework and empirical model rely on the literature reviewed.

3.1 Theoretical Framework

Generally, the performance of cut flower exports depends on influenced by aspects in the demand and supply side. The demand side factors are elements in the external trade environment whereas supply side are internal element. some of the external factors include; real exchange rates, foreign income, inflation, distance and prevailing trade policies. In contrast, supply side factors include; price of exports, economic policies, infrastructure and climatic conditions. Following Meme (2015), this study will use the following explanatory variables to investigate the performance of cut flower exports in Kenya;

    i.   GDP of major trading partners in the EU

    ii.   Real exchange rate;

    iii.   Inflation;

    iv.   Transport costs;

    v.   Trade liberalization

The functional relationship between the dependent and explanatory variables is as shown in equation 1 below;

$$X_f = f\,[\,Y_f\,,\,R_f\,,I_f\,,T_f\quad TL_f\,] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where;

X_f = Volume of cut flower exports in tonnes

Y_f = Foreign income captured by GDP per capita of 5 major trading partners

R_f = Real exchange rate

T_f = Transport cost

TL_f = Trade Liberalization

I_f = Inflation rate

Table 2 summarizes the variable descriptions, measurements, expected signs and sources of the data.

Table 2: Variable definition, Measurements and Source

Variable Name	Variable Description	Measurements	Expected Sign of the coefficient	Source
X_t	Rate of change in the volume of Kenyan cut flower exports	Metric tonnes		Various Series of KNBS Economic Survey
Y_t	Average GDP per capita of five major trading partners in the EU i.e UK, Germany, Netherlands, Italy and France	USD	Positive	World Bank (2016)
R_t	Domestic prices divided by foreign price multiplied by Nominal exchange rate	ratio	Negative	Central Bank of Kenya
I_t	Inflation rate in Kenya	Percentage	Negative	Central Bank of Kenya
T_t	Freight charges to trading partners	USD	Negative	Kenya AirPort Authority
TL_t	Trade Openness Ratio	ratio	Positive	

3.2 Definition of Variables

3.2.1 GDP of Major trading partners

This is also referred to as foreign income. This paper seeks to examine the relationship between foreign GDP and the Kenyan cut flower export performance. The variable will be taken as the average GDP of five key business partners from the European Union market i.e UK, Germany, Netherlands, France and Italy. It explains the income elasticity of cut flower exports i.e the degree of variance of cut flower exports due to a variance in income of importing countries.

Generally, a change in the GDP of foreign countries affects exports through the income effect. According to Meme (2015), income effect occurs when a change in real income affects consumption. This concept is explained by Engel curve which depicts the relationship between household expenditure on a certain good or service and household income. In most cases there exists a significant and positive relationship between foreign income and performance of cut flowers. This relationship means a rise in the income of the Kenya's business partners will lead to rise in the exports and the reverse is true. Therefore, β_1 (the coefficient of foreign income) is expected to be positive.

3.2.2 Real Exchange Rate

According to UNCTAD (2005), the real exchange rate reflects the primary relative movement of domestic and foreign prices. Generally, real exchange rate is deemed to have a significant influence on the export performance of countries with dismal performance. Meme (2015) defines real exchange rate as nominal exchange which has been adjusted so as to cater for differences in the price level between countries and is expressed as follows;

RER= E.(P/P*)

Where; RER = real exchange rate;

E = nominal exchange rate;

P* = foreign price of cut flower exports and;

P = domestic price of cut flower exports

The real exchange rate explains the price elasticity of cut flower exports. This means it measures the responsiveness of cut flower exports to movement in prices in the domestic and foreign market. The price effects are felt when there is a depreciation or appreciation in currency. For example, a depreciation in Kenyan currency relative to the trading partners currency makes the exports cheaper in the foreign market thereby increasing the demand. On the other hand, an appreciation in domestic currency relative to foreign currency increases the price of exports thereby decreasing the demand. Therefore, there is an inverse relationship between real exchange rate and the performance of cut flower exports. β_2, (coefficient of real exchange rate) is expected to be negative.

3.2.3 Inflation Rate

Inflation is a macroeconomic variable that affects the demand and supply of commodities in any economic system. This through changes in the price of the commodities. Manamba (2016), study explains that increases in inflation rate of the exporting economy may cause exports to become more expensive, leading to a decrease in exports. Inflation increases the cost of production as it increases costs of inputs and costs of labor this will lead to decrease competitiveness of a Countries products and thus decreased exports. The increased cost of production will also translate to an increase in prices of the exported commodity which may lead to the exporter substituting the expensive good with a cheaper good. Furthermore, inflation increases interest rates in a country and therefore increasing the costs of production due to increased costs of inputs and inflation also increases the cost of borrowing. The horticulture sub-sector is capital intensive due to the high costs of inputs including the setting up of green houses, pack houses, cooling facilities, costs of fertilizers and agrochemicals and therefore an increase in inflation will discourage farmers from borrowing to expand their cut flower farming. This in turn negatively affects exports. Similarly, Rono et al., (2018) explains inflation as a determinant of cut flower export earnings in Kenya. There is an indirect relationship between inflation and export performance. β_3, (The coefficient of inflation) is expected to be negative.

3.2.4 Transport Cost

Transport cost considers the charges involved during transition of the export commodity to the market. This study will consider the effects of average freight charges from Nairobi to the export destination on the cut flowers performance in Kenya. According to Kenya Flower Council, 95% of cut flower exports are transported by air. This make cargo space a key determinant of export performance. Generally, the freight charges are transferred to the consumer of the cut flower by the exporter thereby affecting the pricing. This relationship is inverse meaning an increase in transport cost leads to a decline in cut flower exports. Therefore, β_4 (the coefficient of transport) is expected to negative.

3.2.5 Trade Liberalization

Trade liberalization through the various trade agreements make trade between countries easier. This is through removal of tariff barriers such as reduction in custom duties and relaxing of the quotas. Authors such as; Torayeh (2014), Were et al (2009), and Khan (2002) used trade

liberalization to measure the competitiveness of exports in their countries. The study will use trade openness ratio to represent Trade liberalization. An improvement in trade policy increases exports and therefore, the relationship between trade liberalization and the cut flower export performance in Kenya deemed to be positive. β_5 is expected to be positive.

3.3 Empirical Model

The model will be in the form below;

$X_t = \beta_0 \, Y_t^{\beta_1} \, R_t^{\beta_2} \, I_t^{\beta_3} \, T_t^{\beta_4} \, TL_t^{B_5} \, \varepsilon_t$ …………………………………. equation (2)

Where;

X_t = Volume of cut flower exports in tonnes

β_0 = Constant

$\beta_1 - \beta_5$ = Regression coefficients

Y_t = Foreign income captured by GDP per capita of 5 major trading partners

R_t = Real exchange rate

T_t = Transport cost

TL_t = Trade Liberalization

I_t = Inflation rate

ε_t = Stochastic disturbance term

Estimated model

Equation 2 is linearized using natural logarithms. This is to allow for estimation of a cut flower export equation as a linear function.

By applying the double logs on equation 1 we get the following equation;

$\mathrm{In}\, X_t = \beta_0 + \beta_1 \mathrm{In}\,(Y_t) + \beta_2\,(R_t) + \beta_3 \mathrm{In}\,(I_t) + \beta_4 \mathrm{In}\,(T_t) + \beta_5 \mathrm{In}\, TL_t + \varepsilon_t$……………………equation (3)

The coefficients of the explanatory variables in equation 2 explain the responsiveness of the dependent variable to changes in the independent i.e elasticity. β_0 represent the constant term that explains factors such as technological shocks. β_1 and β_2 represents income and price elasticity. A detailed description for the independent variables affecting cut flower exports is as below.

3.4 Estimation Techniques

The performance of Kenya's cut flower exports, equation 2, will be estimated using Vector Autoregressive Model (VAR) through a time series analysis covering the period from 1986-2018. According to Alemayehu (1999), in most cases time series is non-stationary at a level and application of Ordinary Least Square (OLS) in presence of non-stationary time series will probably cause spurious regression results. In this case testing of stationary at initial step was key for reliable results. Augmented Dickey Fuller test (ADF), the commonly applied approach to examine stationarity of time series data will be employed. Cointegration analysis will also be used to provide a means for clearly differentiate between the long-term and short-term elasticities through the Error Correction Method. Engel Granger test will be applied in the study.

3.4.1 Diagnostic Tests

Diagnostic tests are essential in determining how time series data will be modeled. The study will carry out both pre-estimation and post Estimations tests to ascertain the validity of the VECM results

3.4.1.1 Pre-Estimation Tests

The study will conduct unit root test and cointegration test to examine presence or absence of stationarity and cointegration of variables. ADF test was applied to check for stationarity of variables as non-stationarity of data usually leads to false regression results. The tests are important as they ensure model is adequate.

Unit root test

The study will use ADF test for presence of unit root to determine stationarity of data i.e. constant mean and variance. The null hypothesis will be to assess presence of a unit root and the alternative theory is stationarity. For this test, the null hypothesis is rejected if the test statistic is less than the critical value. Rejection of null hypothesis means there is a unit root hence non-stationarity.

Cointegration analysis

Variables are said to be cointegrated if a linear combination of these variables has a lower integration order. Cointegration analysis was used in case of non-stationarity of data to check for

short run and long run effects. Vector Error Correction Model (VECM) is to be used if there was co-integration (long run relationship) and VAR if no cointegration (for short run relationship).

3.4.1.2 Post Estimation Tests

The study will ensure reliability and validity of the data results through post estimation tests. To achieve this, normality and autocorrelation tests will be applied. The study will use Jarque-Bera (JB) test to ensure the residuals are normally distributed. Additionally, Lagrangian Multiplier Test for Residual Autocorrelation will be used to rule out serial correlation.

3.5 Data type and sources

The study data will be yearly time-series data for Kenyan cut flower exports for the period between 1986 and 2018.This secondary data is contained in various issues of Economic Surveys, World Bank, Kenya Flower Council, and Central Bank of Kenya (CBK). The data on cut flower exports will be generated from KNBS whereas foreign income will be generated from World Bank. Furthermore, data on real exchange rates and inflation rate will be obtained from CBK. Finally, freight charges data will be obtained from World Bank.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the research findings. It contains two sections i.e. section 4.1 and 4.2. Section 4.1 show the descriptive statistics whereas section 4.2 presents econometric estimates with their discussions in conjunction with the study objectives.

4.2 Descriptive Statistics

The section presents the different depictive statistics for our study i.e. mean, standard deviations as well as correlation matrix. The summary statistics are contained in Table 3 and 4 below, where table 3 presents means, standard deviation, minimum and maximum values of the dependent and independent variables. On the other hand, table 4 presents the correlation matrix.

Table 3: Summary Statistics

Variable	No of Observation	Mean	Std. Dev.	Min	Max
X_t	33	65.38	46.07	6.2	161.2
Y_t	33	31999.23	6502.03	12980.31	41557.75
R_t	33	65.12	26.42	16.23	103.68
I_t	33	11.59	8.41	1.55	45.98
T_t	33	151.13	9.26	39.2	301.22
TL_t	33	0.55	0.08	0.38	0.73

Source: Computation from research data.

From Table 3 show that there were 33 observations for all the variables. The growth in volume of cut flower exports (X_t) had a mean of 65.38 with a standard deviation of 46.07. The standard deviation of 46.07 shows the spread in the growth in volume of cut flowers in Kenya for the period

under review. This means it shows the distance between the actual and mean of a variable. Additionally, the values of (X_t) lies between 6.2 and 161.2 with a maximum and minimum of 161.2 and 6.2 respectively.

Table 4: Correlation Matrix

	X	Y	R	I	T	TL
X_t	1.0000					
Y_t	0.1649	1.0000				
R_t	0.1771	0.6270	1.0000			
I_t	-0.0123	-0.3916	-0.3824	1.0000		
T_t	0.0808	0.6701	0.6125	-0.2691	1.0000	
TL_t	-0.1876	-0.3426	-0.2416	0.5210	-0.2733	1.0000

Source: Computation from research data

Table 4 summarizes the correlation between variables i.e the strength and direction of the linear relationship between growth in cut flower exports and factors such as; inflation, world income, real exchange rates, transport costs and trade liberalization. It is evident that there is a positive linear relationship between volume of cut flowers (X_t) and the following variables world income (Y_t), real exchange rate (R_t) and transport costs (T_t). This means that an increase in the explanatory variables; real exchange rate, Transport costs and income leads to increase in growth of the volume of Kenyan cut flowers. I_t and TL_t exhibit a negative linear relationship in relation to growth in volume of Kenyan cut flowers. This means as the inflation rate and trade liberalization increase, the growth in volume of cut flowers decreases.

4.3 Econometric Estimation

This study purpose to estimate the factors affecting the performance of cut flower exports. To achieve this, the study estimates performance of cut flowers by analyzing the growth rate in volume of cut flower exports in Kenya against several independent variables. Real exchange rate measures the price effect whereas foreign income measures the income effect. Further, trade openness ratio is used as a proxy for trade liberalization and transport costs are represented by freight charges. The study uses time series methodology to estimate the equation. A unit root test is conducted to

ensure stationarity of variables since non-stationarity presents a serious challenge during estimation.

4.3.1. Unit Root Test

The non-stationary of variables is often associated with wrong or misleading statistical inferences which ultimately leads to wrong conclusions. The study used ADF to check for variable stationarity. This test has three models: (1) intercept (2) intercept and trend and (3) suppressed intercept and trend. Null hypothesis for this test is that, unit root is present in the series. For the series to be termed stationary, the absolute test statistic in the three models must be greater than absolute critical value at 99% and 95% confidence intervals. Table 5 presents ADF results.

Table 5: Unit Root Test at Level

Variable	Test statistic Intercept Only	Critical Values at (1% and 5%)	Test Statistic Intercept & trend	Critical Values (1% 5%)	Test statistic Suppressed intercept & trend	Critical Values (1% and 5%)	Remarks
X_t	(2.315)	(3.750) (3.000) (2.63)	(2.921)	(4.380) (3.600) (3.240)	0.770	(2.660) (1.950) (1.600)	Unit root
Y_t	(6.725)	(3.702) (2.980) (2.622)	(15.461)	(4.316) (3.572) (3.223)	(2.776)	(2.649) (1.950) (1.603)	Not unit Root
R_t	(-2.516)	(3.702) (2.980) (2.622)	(1.655)	(4.316) (3.572) (3.223)	(2.334)	(2.649) (1.950) (1.603)	Unit root
I_t	(4.245)	(3.702) (2.980) (2.622)	4.720	(4.316) (3.572) (3.223)	0.980	(2.649) (1.950) (1.603)	Unit root
T_t	(0.934)	(3.702) (2.980) (2.622)	(1.184)	(4.316) (3.572) (3.223)	1.879	(2.649) (1.950) (1.603)	Unit root
TL_t	(2.167)	(3.702) (2.980) (2.622)	(2.509)	(4.316) (3.572) (3.223)	0.077	(2.649) (1.950) (1.603)	Unit root

Source: Computation from research data

The results from table 5 confirms only foreign income has no unit root. All the other variables were confirmed to have unit root. This is because, their test statistic is not greater than the critical values at 1% and 5% levels of confidence. To correct for the unit root, the study differenced all these variables and then conducted another ADF test whose results are shown in Table 6.

Table 6: Unit Root Test Results First Difference

Variable	Test statistic Intercept Only	Critical Values (1% and 5%)	Test statistic Intercept & trend	Critical Values (1% 5%)	Test statistic Suppressed intercept &Trend	Critical Values (1% and 5%)	Remarks
X_t	3.674	(3.550) (3.000) (2.630	(4.471)	(4.380) (3.600) (3.240)	(3.585)	(2.660) (1.950) (1.600)	No unit root
Y_t	(6.725)	(3.702) (2.980) (2.622)	(15.461)	(4.316) (3.572) (3.223)	(2.776)	(2.649) (1.950) (1.603)	No unit Root
R_t	(4.635)	(3.709) (2.983) (2.623)	(5.178)	(4.325) (3.576) (3.226)	(3.943)	(2.650) (1.950) (1.602)	No unit root
I_t	7.313	(3.709) (2.983) (2.623)	(7.217)	(4.325) (3.576) (3.226)	7.440	(2.650) (1.950) (1.602)	No unit root
T_t	(5.052)	(3.709) (2.983) (2.623)	(4.941)	(4.325) (3.576) (3.226)	(4.760)	(2.650) (1.950) (1.602)	No unit root
TL_t	5.855	(3.709) (2.983) (2.623)	(5.912)	(4.325) (3.576) (3.226)	(5.955)	(2.650) (1.950) (1.602)	No unit root

Source: computation from research data

After conducting another ADF test at the first difference, all the other variables were confirmed to be stationary.This means they were stationary as their test statistic was greater than the critical

values at 1% and 5% significance levels. After confirming stationarity of variables, the study conducted a cointegration test to examine whether the relationship between variables is long term or short term.

4.3.2 Johansen Co-integration Test

This test is used to determine the nature of relationship between variables i.e. long term or short term. The null hypothesis for this test is there is no cointegration and the alternative is presence of cointegration. The null hypothesis is accepted if the trace statistic is greater than the critical value i.e. no cointegration. The analysis concentrates on maximum rank, trace statistic and the critical value.

Table 7: Johansen Co-integration Test

Sample: 1986 - 2018		Number of lags=1		No. of Observations=33	
Maximum Rank	Parms	LL	Eigen value	trace statistic	critical value at 5%
0	42	(355.84183)	-	-	-
1	53	(329.94297)	0.83239	142.6034	94.15
2	62	(307.10419)	0.79301	90.8057	68.52
3	69	(295.00297)	0.56594	45.1282*	47.21
4	74	(287.49415)	0.40420	20.9257	29.68
5	77	(284.96502)	0.16006	5.9081	15.41
6	78	(284.54011)	0.02888	0.8498	3.76

Source: Computation from research data

Table 7 confirms the number of lags is one. At maximum rank one, the statistic value is 142.60 and the corresponding critical value is 94.15. Therefore, the null hypothesis is accepted as the trace statistic is greater than the critical value at 5% level of significance. This means that there is no cointegration. Similarly, at maximum rank two, the trace statistic is greater than critical value

32

at 5% significance level i.e. 90.80 > 68.52. Hence, the null hypothesis is accepted. For the maximum rank three, four, five and six, the trace statistic is less than the critical value meaning the null hypothesis is rejected. This means that there is cointegration. Presence of cointegration means there is a long-term relationship between variables hence the use of Vector Error Correction Model.

4.3.3 Vector Error Correction Model (VECM)

The model analyses the cointegrating relations between the independent and dependent variable. The results are analyzed in three parts i.e. model fitness, short term statistical significance and long-term statistical significance of the model. Table 8 summarizes on the fitness of the model through an analysis of R-squared and Table 9 and table 10 summarizes on the nature of the relationship.

Table 8: Summary Statistic results of Vector Error-Correction Model

Sample: 1986 - 2018			Number of	observations	=33
			AIC	=	44.99827
Log likelihood = -621.9741			HQIC	=	45.79019
Det (Sigma_ml) = 4.10e+10			SBIC	=	47.47372
Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnX	8	35.9111	0.1583	4.137721	0.8445
D_lnY	8	407.81	0.7614	70.19447	0.0000
D_lnR	8	6.66305	0.2483	7.266441	0.5082
D_lnI	8	9.85669	0.1202	3.004791	0.9341
D_lnT	8	28.1547	0.2340	6.721004	0.5670
D_lnTL	8	.050882	0.5032	22.28101	0.0044

Source: Computation from research data

33

Table 8 show the results of first difference of the variables; D lnX, D lnY, D lnR, D lnI, DIn T, DInTL. R-squared values indicate the magnitude of variations for the cut flower export growth caused by the independent variables. The significance of these results is determined by the value of $P > Z$ which is the probability value greater than the critical value. If the probability value is same as or close to zero then then the results are significant. Additionally, if the probability value is greater than zero, then the results are insignificant. The results indicate 76.14% variations in growth of cut flower exports in Kenya are explained by independent variable.

Table 9 presents the results of short run causality between the growth of cut flower exports in Kenya and the explanatory variables. The short-term causality between the variables is ascertained by analyzing the lag coefficient and probability values of each independent variable. The lag coefficients are only significant if the probability values are lower than critical value at 5% significance level.

Table 9: Summary for Short-run Parameters of VECM

Variable	Coefficient	Standard Error	Z	P> Z	95% Conf.Interval	
D_lnX	-.1237058	.248626	-0.50	0.619	-.6110037	.3635921
lnX LD	-.241631	.3112958	-0.78	0.438	-.8517595	.3684975
lnY LD	-.001022	.0066327	-0.15	0.878	-.0140219	.0119778
lnR LD	-.137776	2.564327	-0.05	0.957	-5.163764	4.88821
lnI LD.	-.5571446	.9039999	-0.62	0.538	-2.328952	1.214663
lnT LD	.1824234	.383931	0.48	0.635	-.5700676	.9349144
lnTL LD.	0.11381	138.2462	0.08	0.934	-259.5759	282.3391
_cons	-11.29924	24.98571	-0.45	0.651	-60.27034	37.67185

Source: Computation from research data

From table 9 above, none of the variables is statistically significant as the p values are higher than the critical values at all given levels of significance. This means there is no short-term relationship between growth of Kenyan cut flower export and foreign income, real exchange rate, inflation, transport costs and trade liberalization.

Furthermore, table 10 presents the summary results for the long run causality between the growth of cut flower exports in Kenya and the explanatory variables. The VECM results are analyzed in term of sign of the coefficient and p values of each independent variable. The results are only relevant if the coefficient of each variable is negative and the test statistic value is lower than the critical value at 5% significance level.

Table 10:Summary Statistics for Cointegration Equations of VECM

Equation _ce1	Parms 5	Chi2 126.6235	P > Chi2 0.0000			
Beta	Coef.	Std. Err	Z	P> Z	[95% Conf.	Interval]
lnX	1					
InY	.0513196	.0060854	8.43	0.000	.0393924	.0632468
lnR	-.7039531	.7611716	-9.25	0.000	-8.5314	-5.547662
lnI	-.3124414	.5700017	-5.48	0.000	-4.241597	-2.007232
lnT	-.9594321	.1414059	-6.78	0.000	-1.236582	-.6822816
lnTL	.802322	7.932665	10.11	0.000	646.8449	957.7996
_cons	-159.4709					

Source: Computation from research data

Table 10 shows that all the explanatory terms are significant at 5% level of significance. This is because the test statistic value for each variable are less than the critical values. This means that a unit rise in foreign income leads to 0.05 rise in cut flower export growth for Kenyan exports. The positive link between foreign income and the cut flower exports in Kenya is empirically accurate since the foreign income explains the income elasticity of cut flower exports. A unit change in real exchange rate leads to 0.7 decrease in cut flower export growth. The negative sign of the coefficient is empirically correct, since the real exchange rates explains the price elasticities of the cut flower exports which are felt by either depreciation of appreciation in currency. Further a unit change in inflation leads to a 0.3 decrease in cut flower exports. The sign of the coefficient is empirically accurate since a rise in inflation in the exporting country which is mainly translates to an increase in cost of production decreases the same exports. A unit change in transport cost leads to 0.95 decrease in cut flower export growth in Kenya. The coefficient sign is also empirically

true as it shows the inverse relationship between exports and the transport costs. The transport costs which has been measured by the freight charges are transferred to the consumers and thus increasing the prices of the commodity and thus decreasing exports. Furthermore, unit change in trade liberalization leads to about 0.8 increase in growth of cut flower exports. An improvement in trade policy increases exports and therefore, the relationship between trade liberalization and the cut flower export performance in Kenya is expected to be positive and therefore the coefficient sign in empirically correct.

4.3.4 Post estimation tests

This study conducted post estimation test to check for validity of the model. Autocorrelation and normality test were conducted to test for validity of the model. Table 11 and Table 12 presents the autocorrelation and normality test respectively.

Table 11: Lagrangian Multiplier Test for Residual Autocorrelation

Lag	Chi2	df	Prob > chi2
1	31.3651	36	0.00866
2	37.3662	36	0.03061

Source: Computation from research data

The null hypothesis is no autocorrelation at lag order**.** The Lagrangian Multiplier Test results indicate acceptance of the null hypothesis. This is because p values are all < 0.05 at confidence level. Hence the model is free from the problem of autocorrelation.

Table 12: Jarque-Bera (JB) Test/ Normality Test

Equation	Chi2	df	Prob > chi2
D ln X	4.898	2	0.00000
D ln Y	7.705	2	0.42123
D ln R	24.768	2	0.00000
D ln I	0.075	2	0.96332
D ln T	27.624	2	0.00000
D ln TL	0.136	2	0.93438
ALL	135.205	12	0,00000

Source: Computation from research data

The null hypothesis is residuals of variables are normally distributed. i.e. JB estimates are indifferent from zero. Therefore, the variables growth of cut flower export, real exchange rate, transport costs are normally distributed whereas foreign income, inflation and trade liberalization are not. In overall, there is a normal spread in model.

4.3.5 Stability Test

The firmness of the model is tested by analyzing the eigen values. Specifically, the test concentrates on the interpretation of the modulus of the eigen value. The model is deemed stable if the modulus value is less than 1 and if all the points are within the root of companion matrix circle.

Table 13: Eigen Stability Condition

Eigen Value	Eigen Value	Modulus
1		
1		
1		
1		
1		
.00117477 +	.6414773i	.641478
.00117477 -	.6414773i	.641478
.1777936 +	.2570799i	.312571
.1777936 -	.2570799i	.312571
.2658569		.2658569
.09284605 +	.03869431i	.100586
.09284605 -	.03869431i	.100586

Source: Computation from research data

Table 13 confirms the study model is stable as all the modulus values are less than 1. Additionally, figure 3 confirms the model is stable as all the points are contained in the circle on roots of the companion matrix.

Figure 3: Roots of the Companion Matrix

Roots of the companion matrix

The VECM specification imposes 5 unit moduli
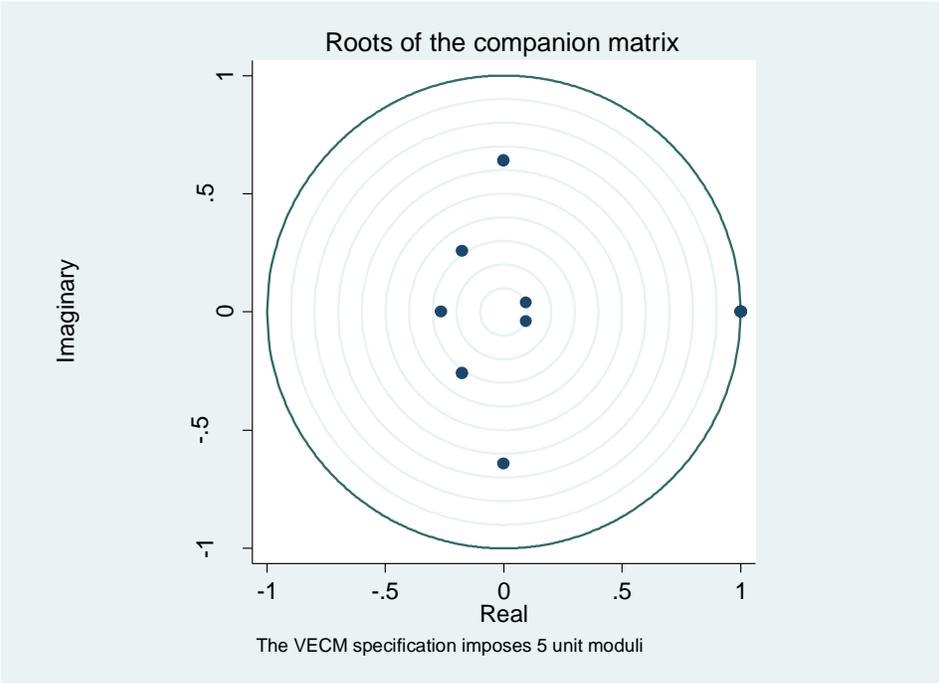
Source: Computation from research data

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATION

5.1 Introduction

It is the final chapter of the study and contains the summary, conclusion and recommendation. The summary gives a brief on the topic, research problem and relevance of the study. The conclusion summarizes on the study findings. Finally, recommendation advises on policy improvement and suggests on areas of further study.

5.2 Summary

The study objective aimed at establishing the main factors influencing cut flower exports from Kenya to five major business partners in the European Union market i.e UK, Germany, Netherland, France and Italy. Vector Error Corrected Model was adopted in the analysis. The model had five independent variables that is; the weighted foreign income for the five major trading partners in the EU, Inflation rate in Kenya, Transport Costs measured by the freight charges from Kenya to the five countries, Real Exchange Rates and the Trade openness Ration. The dependent variable was the quantity of the Kenyan cut flower exports to the five major business partners in the EU.

Augmented Dickey Fuller test was used to check for variables stationarity. At level only one variable (Foreign Income) did not have unit root. To correct this, the study differenced all other variables and conducted another ADF test. At the first difference all other variables were confirmed to have no unit root. The study also conducted a cointegration test to examine whether the relationship between variables was long term or short term. Johansen Cointegration test was used to examine the nature of the association between the variables.

The test results indicated presence of cointegration meaning there was a long-term relationship between variables. Hence, VECM Model was adopted. The analysis proved that all independent variables were significant in influencing the quantity of the cut flower exports from Kenya to the five major business partners in the EU. All the coefficients of the independent variables were significant at 95% confidence interval.

Coefficients of the Foreign GDP and Trade Liberalization were positive as expected. On the other hand, real exchange rates, transport costs and Inflation coefficients were found to be negative as expected. Hence, the results met the study expectations.

5.3 Conclusion

From the regression results Foreign Income, Real Exchange rates, Inflation Rates in Kenya, Transport Costs and Trade Liberalization significantly influence the quantity of cut flower exports from Kenya to the five major trading partners in the European Union. Foreign income and Trade liberalization positively influence the quality of cut flower exports while Real Exchange Rates, Inflation Rate in Kenya and Transport costs negatively influence the quantity of cut flower exports. This means that the factors are important determinants of cut flower flowers exports in Kenya. Monitoring these variances in the quantity of Kenyan cut flower exports resulting from changes in the study factors is important for economic growth.

Specifically, the study implies that there is a direct long-term relationship between foreign income and quantity of cut flower exports in Kenya. This meant that cut flower exports are income elastic. However, in the short run, the effects of foreign income on cut flower exports were negative and minimal. This means that cut flower exports were income inelastic in the short run and that the relationship was inverse.

Moreover, the study found a significant inverse long run relationship between real exchange rate and the volume of cut flower exports in the long run. The study found that a unit decrease in real exchange rate led to about 0.13 decrease in volume of cut flower exports. This meant that cut flower exports were price elastic in the long term but not in the short term. This is because depreciation of Kenya's currency increases the demand of cut flower exports in the international markets. The inverse relationship between the quantity of the cut flower exports and real exchange rates is in line with Hausmann, Pritchett and Rodrick (2005) findings where there was a direct relationship between economic growth (attributed by increase in exports) and depreciation in real exchange rate.

The long-term association between the volume of cut flower exports and inflation rate in Kenya was found to be significantly negative at 5 percent significance level. The short run relationship was also found to be negative and insignificant. In the short term, a unit rise in inflation rate of the domestic economy led to about 0.55 decrease in the volume of cut flower exports. This meant that the performance of cut flower exports in Kenya was influenced by the rate of inflation in the long term but not in the short run. Inflation increases interest rates in a country and therefore increasing the costs of production due to increased costs of inputs and inflation also increases the cost of borrowing. The horticulture sub-sector is capital intensive due to the high costs of inputs including the setting up of green houses, pack houses, cooling facilities, costs of fertilizers and agrochemicals and therefore an increase in inflation will discourage farmers from borrowing to expand their cut flower farming.

Furthermore, the study found a negative and significant relationship between transport costs and volume of Kenyan cut flower exports in the long run. However, this relationship was insignificant in the short run as the test statistic was greater than the critical value at 5% level of significance. This means that volume of cut flower exports was unresponsive to changes in the transport costs in the short term. The transport costs are the freight charges from Kenya to the five main trading partners in the EU. Increase in these charges are also transferred to the consumers and thus increase the cost of the product. High freight charges decrease demand of the cut flowers due to increased prices.

Moreover, there was a long-term relationship between trade policies and volume of cut flower exports was found to be significantly positive. However, in the short run this relationship was insignificant at all levels of significance. This meant there was no short-term relationship between trade policy and volume of cut flower exports.

5.4 Policy Implication

Improving the performance of cut flower exports is important as it foster economic growth and development in any economy. Therefore, it is paramount to analyse the factors that encourage or discourage the growth of cut flower exports. From this study, it is clear that transport costs hinder the growth in volume of cut flower exports in Kenya. Hence, there is need to look into ways

of minimizing these costs. This calls for action by the major stakeholders such as the government and transport agencies. For example, the government could involve policy makers in adopting policies geared at reducing freight charges. This can also include increase of cargo space for the cut flowers.

It is evident that there is untapped potential in the regional markets. This can be achieved through exploring regional markets in the East African region, the distance is most at times shorter and road transport can also be utilized. This will entail improvement of the road infrastructure connecting Kenya and the East African region, this will also call for more innovative ways of improving Kenyan products through value addition and product differentiation.

It is also apparent that there is greater potential in the foreign market. This is because foreign income only increases the volume of cut flowers by 0.05 unit only. This means increase in the disposable incomes of the importers has a minimal effect on the demand for cut flowers. This could be due to poor brand visibility, lack of value addition, broker problems and price or quality of the cut flower exports from Kenya. Therefore, there is a need to investigate the cause of this performance and adopt measures to improve.

The study results also indicates that depreciation in Kenya's currency increases the quantity of cut flower exports and vice versa. This is because depreciation in Kenya's currency increases the demand of cut flower exports in the global markets. The inverse relationship between the quantity of the cut flower exports and real exchange rates is in line with Hausmann, Pritchett and Rodrick (2005) findings where there was a direct link between economic growth (attributed by increase in exports) and depreciation. To address these monetary institutions should put in place policies that sustain the real exchange rates that are competitive to cut flower exports. The government can also increase foreign exchange reserves in its efforts to stabilize real exchange rates.

Increased inflation rates increase the rate on interests in a country. In our case an increase inflation negatively affects the quantify of flower exports. This is attributed by the increase in cost of production and borrowing. In addressing this the government should always find ways of

adopting policies that lower inflation. Additionally, the government should regulate the lending rates as this will inhibit commercial banks from exploiting farmers who borrow to finance their cut flower farming. Additionally, the government through the Central Bank of Kenya should regulate capital flows so as to avoid excess money in circulation.

Finally, the government should continue with trade liberalization efforts. From the study, relaxation of trade barriers improves the performance of Kenyan cut flowers by a big margin. Therefore, it is essential that the government continues to eliminate barriers to trade in the cut flower exports.

REFERENCES

Awuor E. (2012). The Floriculture Industry in Kenya: A Complex Adaptive Environment
European Journal of Business and Management Vol 4, No.14.

Abbot, J.C (1984) Marketing improvement in the developing world: What happens and what we have learned. Rome, Italy: FAO

Allaro, H.B (2010); Export Performance of Oil Seeds and its Determinants in Ethiopia. *Journal of Cereals and Oil Seeds,* Vol 1(1), pp 1-15.

Barrett, H. and Browne, A. (1996); Export of Horticultural Products in Sub-Saharan Africa: The Incorporation of Gambia. *Geography,* Vol 81(1), pp 47-56.

Barrett, H.R, Ilbery, B.W, Browne, A.W, Binnst, T. (1999); Globalization and the Changing Networks of Food Supply: The importation of Fresh Horticultural Produce from Kenya into the UK. *Transaction of English Geographers, New Series,* 24(2), 159-174.

Belay M. (2014). Challenges in Environmental and Social Sustainability of Floriculture Industry in East Africa: Evidence from Ethiopia

Bartilol, M., Keror, S., & Yego, H., (2019). Kenya's Export of Cut Flowers to the European Union: A Constant Market Share Analysis.

Engel, C. (1993). Real Exchange Rates and Relative Prices: An Empirical Investigation. *Journal of Monetary Economics*, Vol 32, PP 35-50.

Gbentnkom, D. and Khan, S.A. (2002) Determinants of Agricultural Exports: The Case of Cameroon. *AERC Research Paper 1*20. Nairobi, Kenya.

Harris, R.S. and Muthugu, T. (1992). Kenya Horticultural Subsector Survey. Kenya Export Development Support Project. Nairobi, Kenya: KEDS.

Hausmann, R., Pritchett, L. and Rodrik, D. (2005). Growth Accelerations. *Journal of Economic Growth*, 10(4), 303-329.

Hatab A.A., Romstad, E. and Huo, X. (2010) Determinants of Egyptian Agricultural Exports: A
    Gravity Model Approach. *Modern Economy*, 1, 134-143.

http://www.doingbusiness.org/en/data/exploretopics/trading-across-borders.

Jaffe, S. (1995). The Many Faces of Success: The Development of Kenyan Horticultural Export.
    In Jaffee, S. and Morton, J. (eds), Marketing Africa's High Value Foods. Washington,
    D.C.: World Bank.

Kenya Horticultural Development Program (2009) Final Report. Nairobi, Kenya:

Kumar, R.N, Rai, A.B, Rai, M. (2008). Export of Cucumber and Gherkin from India:
    Performance, Destinations, Competitiveness and Determinants. *Agricultural Economics*
    Research Review, Vol 21, pp 130-138.

Khan, S. (2002). Determinants of Agricultural Exports: The Case of Cameroon. African
    Economic Research Consortium, Research Papers.

Laibuni, N., Waiyaki, N., & Ndirangu, L., & Omiti, J. (2019). Kenyan cut-flower and foliage
    exports: A cross country analysis.

Manamba, E. (2016). Determinants of Export Performance in Tanzania. *Journal of Economics*
    Library. Vol 3. 470-487.

McCulloch, N. and Ota, M. (2002). Export Horticulture and Poverty in Kenya. IDS Working
    Paper 174. Sussex, U.K.: Institute for Development Studies. Ministry of Agriculture (2010)
    Economic Review of Agriculture. Nairobi, Kenya: MOA.

Minot, N. and Ngigi, M. (2004); Are Horticultural Exports a Replica Success Story? Evidence
    from Kenya and Ivory Coast. Washington DC, U.S.A.: Environment and Production
    Technology Division and Markets, Trade and institutions Division. International Food
    Policy Research Institute.

Nyairo, N., and Backman, S. (2009). Analysis of Factors Affecting the Supply of Agricultural
    Products: Market Liberalization, Agricultural Policies, Bioenergy Policies, Population

Growth, Input Price Development, Trade Policies and Other Relevant Factors. Discussion Paper No. 36. Helsinki, Japan: University of Helsinki, Department of Economics and Management. 45

Ongeri, B.O. (2014). Small Scale Horticultural Farming along the Kenyan Highways and Local Economic Development. *International Review of Research in Emerging Markets and the Global Economy*.1 (3), 102-119.

Opondo, M. M. (2013). Trade Policy in the Cut Flower Industry in Kenya.

Orindi, M.N. (2011) Determinants of the Kenyan Exports: A Gravity Model Approach. *International Journal of Applied Economics*. 1(1):3-14.

Republic of Kenya, 2018, Kenya National Bureau of Statistics, *Government Printers,* Nairobi

Roy, D.K. (1991). Determinants of Export Performance of Bangladesh. *The Bangladesh Development Studies.* 19(4), 27-48.

Salasya, B.S. (1989) Economic Analysis of the Major Factors Influencing Exports of French Beans from Kenya. MSc. Thesis (unpublished), University of Nairobi.

Schapiro, M.O. and Wainaina, S. (1991). Kenya's Export of Horticultural Commodities. *Public Administration*, 11(3): 257-261.

Tschirley, D., Muendo, M.K., and Weber, T.M. (2004). Improving Kenya's Domestic Horticultural Production and Marketing System: Current Competitiveness, Forces of Change, and Challenges for the Future. Working Paper No. 08B/2004. Nairobi, Kenya: Tegemeo Institute of Agricultural Policy and Development.