AN EMPIRICAL INVESTIGATION OF FACTORS INFLUENCING TEA EXPORT EARNINGS IN KENYA

(1973-2013)

BY

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DECLARATION

I declare that this is my original work and that it has not been submitted in any University for any degree award

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This research project report has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I would like to pass my dedication to my parents Mr. and Mrs. Mutegi Igane for their invaluable support towards my education and teaching me the virtues of determination and hard work.

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LIST OF ABBREVIATIONS

AFFA	Agriculture, Fisheries and Food Authority
ARDL	Autoregressive Distributed Lag
BOT	Balance of Trade
CAK	Competition Authority of Kenya
COMESA	Common Market for Eastern and Southern Africa
CV	Critical Value
EAC	East African Community
EATTA	East African Tea Trade Association
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
KHRC	Kenya Human Rights Commission
KIPPRA	Kenya Institute for Public Policy Research and Analysis
MAFAP	Monitoring African Food and Agricultural Policies
NTZDC	Nyayo Tea Zone Development Corporation
OECD	Organization of Economic Co-operation and Development
OLS	Ordinary Least Squares
SAARC	South Asian Association for Regional Cooperation
TBK	Tea Board of Kenya
UK	United Kingdom
US	United States

ABSTRACT

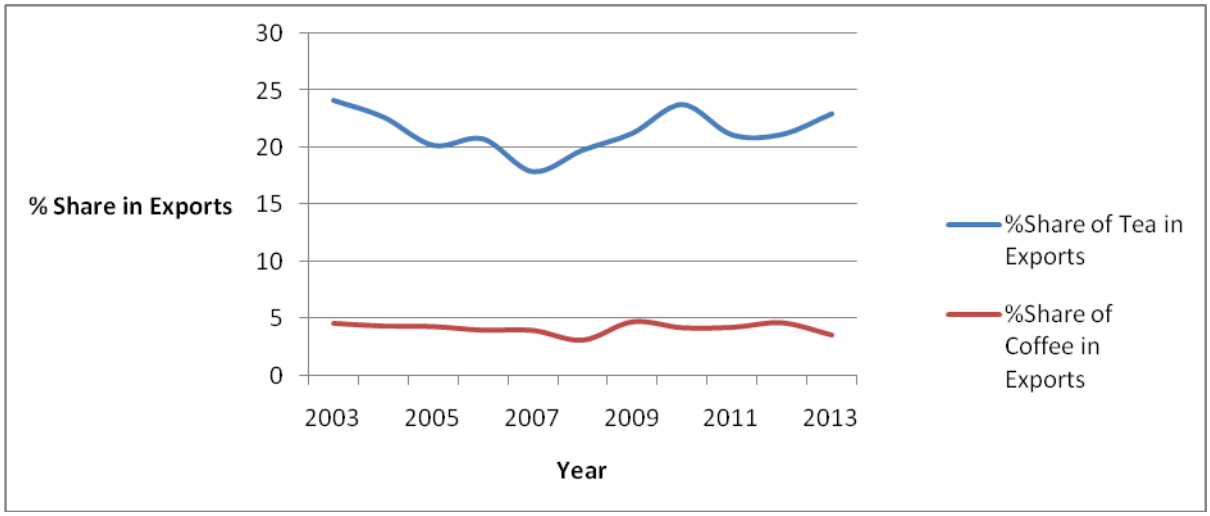
Kenya's tea export earnings have been fluctuating over time causing instability in the farmer's earnings. The fluctuation in the earnings therefore justifies the need to identify the factors which influence the tea earnings with an aim of stabilizing them. The dependent variable was tea export earnings whereas the explanatory variables were exchange rate, inflation rate, foreign income, agriculture value addition, price of tea and volume of tea exported. The main objective of the study was to examine the factors that influence tea export earnings in Kenya for 40 years, running from 1973 to 2013. The specific objective was to estimate the significance of exchange rate, inflation rate, foreign income, agriculture value addition, price of tea and volume of tea exported in determining tea export earnings in Kenya. Various time series methods of regression including heteroscedasticity, multicollinearity, autocorrelation, stationarity and cointegration were used in the analysis. The results showed that the regression did well in regard to the goodness of fit with an R^2 of 98.57 % implying that 98.57 % of the variation in the Tea export earnings was explained by the explanatory variables under study. The findings showed that in the long run, exchange rate, agriculture value addition, price of tea and volume of tea are significant in determining tea export earnings. Foreign income was found to be significant in determining export earnings in the short run. The study recommends legislation of laws that will enhance provision of inputs at subsidized rates and credit to tea growing areas so as to increase volume of tea produced in Kenya, for exports. In addition, there is need for marketing Kenyan tea to many foreign countries by the Ministry of Foreign Affairs and International Trade. Further, the government through the Competition Authority of Kenya should ensure anticompetitive conduct at Mombasa Tea Auction is removed so as to allow the market to determine the price for tea. With regard to value addition, the study recommends export of processed tea. With regard to exchange rate, the study recommends sound monetary and fiscal policies to cushion exchange rate from constant fluctuations.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Kenya's agricultural sector contributes significantly to the Kenyan economy, accounting for 24% GDP, employing two thirds of the population and accounting for 70% of export earnings (AFFA 2015). Further, Agriculture is the main source of foreign exchange for the country through the export of agricultural commodities, whether raw or processed (Kenya Vision 2030). During the fiscal year 2013-14, the sector contributed 27 percent of the total GDP. Tea is the leading export earning cash crop in Kenya and is the leading foreign exchange earner, contributing about 26% of the total foreign exchange earnings and in 2012 (KNBS, 2013). Figure 1.1 illustrate the share of tea and coffee in the exports earnings in Kenya.

Figure 1.1: Share of Tea and Coffee in the Kenya's Export earnings

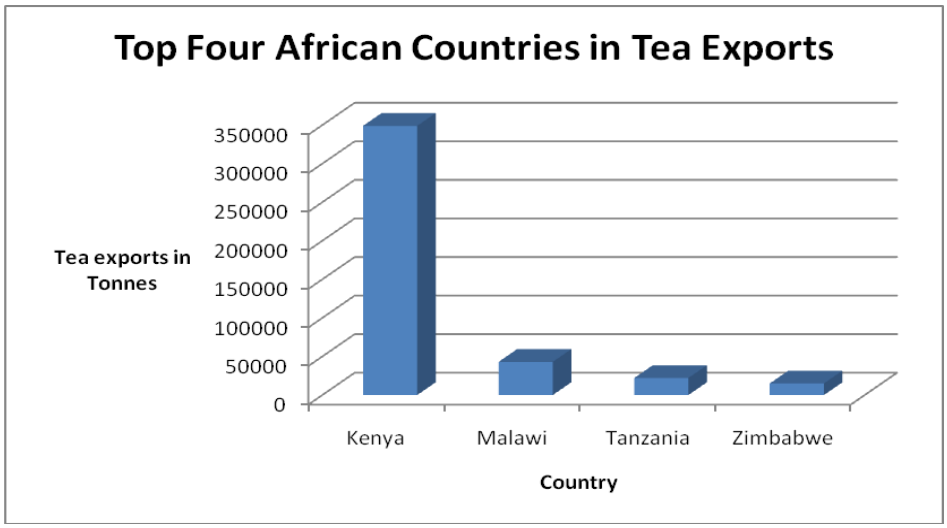


Source: Kenya National Bureau of Statistics, Various Years

The figure 1.1 above indicates that from the year, 2003 to 2013, the value of Kenya's tea has been higher than that of coffee exports. The trend of the export earnings from the year 2003 to 2013, therefore indicates that tea is an important export crop in Kenya.

Tea sector supports livelihoods of more than 3 million persons directly and indirectly. Tea growing and manufacturing are carried out in the rural areas thereby contributing significantly to development of rural infrastructure as well as enhancing the economic well-being of rural communities. The value of tea exports in Kenya grew from KES 63.8 billion in 2008 to KES 101.4 billion in 2012 (AFFA, 2015). In 2013, the income from tea export was at a tune of KES 112 Billion, on a record output of 432 Million Kilograms (Blair & Fenton, 2014). According to the UK Tea and Infusions Association council's report of 2015, Kenya is the Africa's largest producer and exporter of tea followed by Malawi, Tanzania and Zimbabwe respectively. The volumes of tea exported by the countries are shown in figure 1.2 below:-

Figure1.2: Top four African Countries in Tea Exports

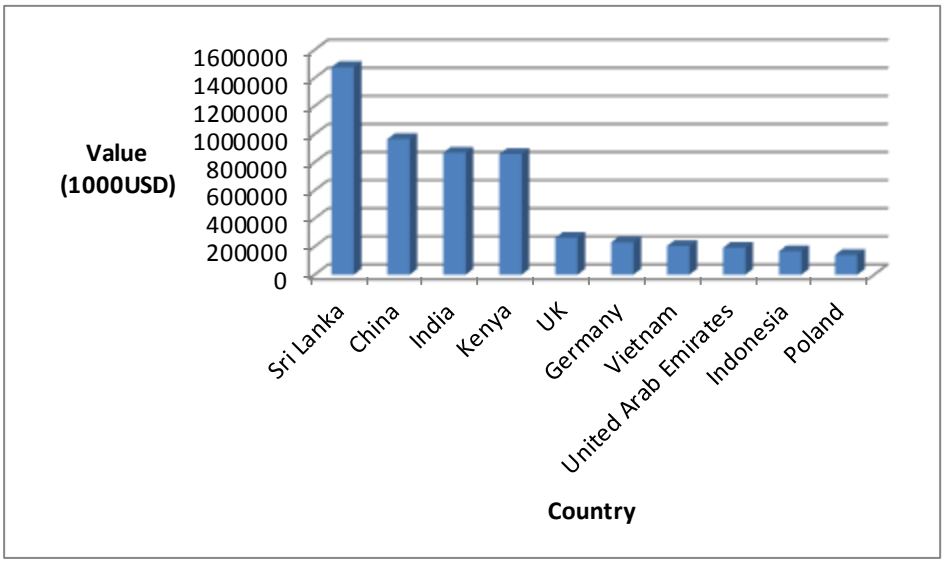


Source: UK Tea and Infusions Association Council, 2015.

Figure 1.2 above, illustrate that Kenya is the leading tea exporter in Africa, with an export volume of 349,000 tonnes, followed by Malawi at 43,000 tonnes, Tanzania at 22,000 tonnes and Zimbabwe at 15,000 tonnes. The four countries export a total of 429,000 tonnes of tea thus commanding 32% of the world tea exports.

Kenya is the world's fourth exporter of tea by value. Sri Lanka is the leading tea exporter by value, followed by China and India in second and third position respectively. The top ten world tea exporting countries are as shown in figure 1.3 below:-

Figure 1.3: Top ten World Tea exporters by Value



Source: *FAO, 2011*

Tea is mainly grown in Kenyan highlands, a region which is characterized by adequate rainfall, rich volcanic soils that are deep, well drained with a PH scale of 4-5 (Muku & Mwaura, 2007). Such a climate has ensured that Kenya's tea has unique quality and taste. High quality of the Kenya tea which has a bright colour, has increased it demand in the

international market since it is used to blend other tea in the global market (Export Promotion Council, 2011)**.**

The government of Kenya has focused on policies pertaining to international trade and commercial policies geared towards ensuring that Kenya's agricultural sector becomes economically viable. For instance the government established ASDS in 2009 whose aim is to position the agricultural sector as a key driver for delivering the 10 percent annual economic growth rate as enshrined in the economic pillar of the Vision 2030. Further, reforms were introduced specifically to enhance production and productivity in the tea industry. These reforms targeted tea volume, players, markets and regulatory framework. The reforms aimed at making TBK stronger in regulating the tea industry. The end goal of these reforms was to ensure that tea industry maintains a leading role in poverty reduction, through generation of income to the majority of population and improved export earnings for the country (TBK quarterly report, 2012).

However, despite the fact that the above interventions have been introduced, stability in farmers' earnings, from tea, has not been realized. This study therefore seeks to investigate factors that influence tea export earnings in Kenya and draw policy recommendations to ensure stability in farmer's tea earnings.

1.2 Tea Exports and Kenya Vision 2030 Nexus

The Kenya's development blue print (Vision 2030) is anchored on three pillars, which include: Economic, Social and Political. The Vision 2030 classifies agricultural sector into four major sub-sectors namely: livestock and fisheries, industrial crops, food crops and horticultural sub-sector. Tea farming in this case is categorized under the industrial

sector, which falls under the economic pillar. The Vision articulates that industrial crops contribute 17 per cent of the total contribution of the agricultural sector in the GDP. The above therefore, indicate that industrial crops such as tea plays a crucial role in stimulating economic developments as aspired in the economic pillar (Kenya Vision 2030).

1.3 Structure and Legal Framework of Kenya Tea Industry

The tea industry in Kenya is regulated by Tea Directorate, under the Agriculture, Fisheries and Food Authority (AFFA). AFFA is a parastatal established through an Act of Parliament under section 3 of the Agriculture, Fisheries and Food Authority Act of 2013. Tea Directorate is mandated to license tea manufacturing factories; carry out research on tea through its technical arm, the Tea Research Foundation of Kenya; to register growers, buyers, brokers, packers, management agents and any other person dealing in tea; and promote Kenya tea in both the local and the international markets. The Board also disseminates information relating to tea and advises the Government on all policy matters regarding the tea industry (Republic of Kenya, 2013).

The other players in the tea industry include Ministry of Agriculture, Tea Research Foundation of Kenya, KTDA, NTZDC. The Ministry of agriculture is mandated to promote and facilitate production of tea, other agricultural products and agricultural raw materials. Tea Research Foundation of Kenya is mandated to research and investigate problems associated with tea in relation to quality, productivity and suitability of land. KTDA, EATTA NTZDC manage tea factories in smallholder sub-sector. EATTA brings

together tea producers, brokers, buyers and packers and Mombasa Tea Auction is conducted under its auspices (AFFA, 2015).

Tea estates which are managed by multinationals are also key participants in the Kenyan tea industry. These multinationals include unilever Tea, James Finlays, Williamson Tea and Eastern Produce Kenya Limited among others (KHRC, 2008).

1.4 Tea Grading in Kenya

Tea products are categorized into three (3) types namely: Green tea, ooling tea and black tea. The categorization is based on the level of oxidation during the tea processing. Green tea is not oxidized, ooling tea is partly oxidized while black tea is completely oxidized. Kenya is a producer of black, Cut, Tear and Curl (CTC) tea. Tea grade is determined by the number of leaves picked together with leaf buds. This could be one leaf, two or none. The highest grade is obtained where only leaf buds are picked using balls of the fingertips so as to avoid bruising (London Tea Packers, 2012).

Most tea from Kenya is auctioned in relation to the factory source and grade at Mombasa Tea Auction Centre. These criteria results to direct feedback of market prices to factories and farmers. The day before the auction, buyers taste different grades of teas produced by different factories to determine which are most appropriate for their companies' products. Tea which is bought at the auction or sold directly by estates is exported in containers to processing facilities, where it is blended with teas from around the world (Dutoi, 2013).

1.5 Tea Auctioning in Kenya

Tea auctioning in Kenya takes place in the Mombasa Tea Auction Center. The Mombasa Tea Auction traces its roots to Export Auction System that was established in 1956. In 1969, the auction center was moved from Nairobi to Mombasa port due to its wide range of services which include warehousing, cargo handling and shipping. The Mombasa Tea Auction comprises of primary grade auction and secondary grade auction which is based on quality. The Mombasa Tea Auction is the second largest tea auction center in the world after Colombo Tea Auction in Sri Lanka. The Mombasa Tea Auction charges 2 percent of the selling price as its operating commission (MAFAP, 2013).

Tea buyers who participate in the Mombasa Tea auction are mainly exporters who export tea to different tea consuming countries. Currently there are 12 brokers who participate in tea auctioning in Mombasa. The volume of tea bought by each broker constantly change depending on importing countries' needs. The buyer's market therefore, seems to be a fairly competitive one (CAK, 2014).

1.6 Challenges Facing the Kenya's Tea Exports

Kenya has over the years relied on traditional markets with a few market destinations, in export of its tea. Overreliance in a few export markets has been identified as an undesirable situation that has potential to negatively affect the Kenya tea exports since whenever there are intermittent trade disputes between Kenya and the leading markets, demand of Kenya tea often fluctuates. Coupled with this, inherent weaknesses and threats such as price and exchange rate fluctuations and high cost of production among others after greatly affected the tea earnings. Further, tea exports have also been affected by

disturbances in the key markets occasioned by political, social, and economic factors such as the recent uprising in Egypt and the shortages of hard currency experienced in Sudan in 2011 (AFFA, 2015).

Presence of import, custom and investment barriers in potential market for Kenyan tea for instance in Angola, pose challenges in penetration of Kenya's tea into those market. Further, existence of bureaucracy in clearing goods for instance in Democratic Republic of Congo market, which is a potential market for Kenya's tea, poses logistical challenges in exportation, due to the country's underdeveloped inland transport system and access to the main Port (Ihiga, 2007).

Challenges related to weather and climatic changes have greatly led to fluctuations in the tea industry earnings, in Kenya. For instance, in 2012, there was frost attack in the tea growing areas and dry and hot weather conditions which was not favorable for tea production. Further, Tea industries in Kenya rely on hand labour which is becoming expensive. Apparently, tea harvesting is very expensive, and currently, it is estimated to account for about 30-40% of all the field costs (AFFA, 2015).

Further, low level of value addition and Limited product diversification hinders country's competitiveness in the tea market. Although some tea companies have diversified their tea products, through packaging, branding tea and aggressively reaching out to both local and international customers through effective distribution channels, this has not been exploited fully by all companies trading in tea (AFFA, 2015). Countries such as UK, Germany, Poland among others, which are key destination of the Kenya tea, have taken the advantage of the Kenya's uncompetitive state due to low levels of value addition and

now have emerged as major world chief exporters of tea products, yet they are not among the top producers of tea (Sessional paper No. 12 of 2012).

Finally, there is alleged collusion in price fixing among tea players at the Mombasa Tea Auction. According to Kenya Tea Board, in their 2014 Tea Industry status report, KTDA who controls 65 percent of the volume of tea at Mombasa Auction, is alleged of manipulating the price of the highest tea grade, for instance Pekoe fanning (PFI) that is produced by majority of the small-scale farmers. Such manipulation of the prices is alleged to have resulted to PFI being sold at low prices or at same price as that of the low grade tea. The report further indicates that some of the tea players at Mombasa Auction also collude with other big marketers who buy directly from them without following due auction procedures. The alleged unorthodox practices by the Mombasa Auction players have led to decrease in tea export earnings (Sambu, 2014).

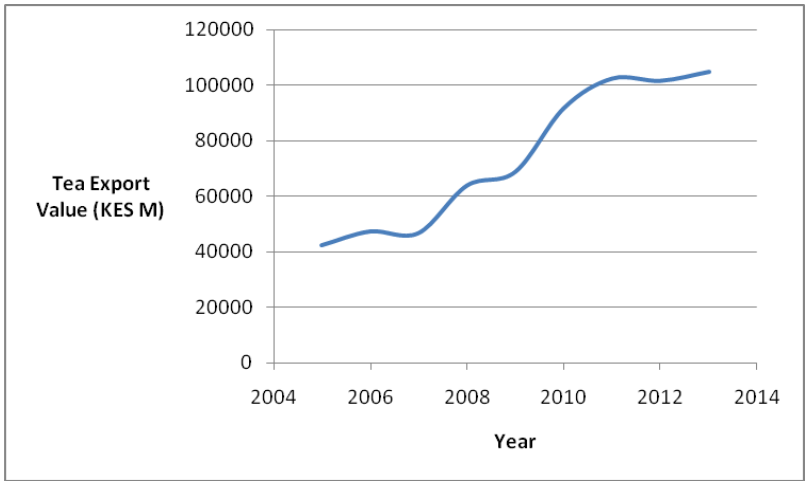
1.7 Problem Statement

The role played by exports in the country's economic development is enormous. Exports stimulate the economy in various ways, such as, the stimulation of the production and adoption of advanced technology, improved efficiency and advancement of human resource. This leads to increased employment in the country. With regard to economic development, exports leads to a higher aggregate demand which results to economic growth. Exports are also important determinant of Kenya's current account deficit since a vibrant export performance shrinks current account deficit (U.S. Department of Commerce, 2014).

The Government of Kenya has introduced various measures to enhance production and productivity in the tea industry. Such measures include: Enhanced research through introduction of quality tea varieties, enhanced promotion and marketing of tea, expansion of tea markets, and enhanced compliance to quality and safety standards that guarantees competitiveness in the international market among others (AFFA, 2015).

Although the above interventions have stimulated the tea export market through the increase in value of the Kenya's tea exports, this has been fluctuating over time thus affecting stability in farmers' earnings. The values of Kenyan tea exports for the running from 2008 to 2013 are shown in figure 1.4 below:-

Figure 1.4: Value of the Kenya's Tea Exports, 2005-2013



Source: *KNBS, Various Years*

Achieving stability in farmer's earnings will be one of the solutions to improving the tea industry. Stability in farmer's earnings can be achieved by undertaking an empirical investigation of factors influencing tea export earnings in Kenya, and coming up with viable policy recommendations to improve tea export performance.

1.8 Research Questions

The study intends to answer the following questions, namely:-

1. What are the determinants of tea export earnings in Kenya?
2. What significance do these factors have on tea export earnings in Kenya?
3. What has been the trend of the tea export earnings in Kenya?
4. What are policy implications arising from this study?

1.9 Research Objectives

1.9.1 General Objective of the Study:-

The main objective of this study is to examine the factors that influence the tea exports earnings in Kenya, for 41 years, running from 1973 to 2013.

1.9.2 Specific Objectives of the Study:-

The specific objectives of the study are:-

(a) To investigate the factors that influence tea export earnings in Kenya.

(b) To estimate the significance of these factors on tea export earnings in Kenya.

(c) To determine the trend of tea export earnings and other variables in Kenya.

(d) To draw conclusions and policy recommendations.

1.10 Significance of the Study

Agriculture sector is very crucial towards the attainment of the Kenya Vision 2030. This study will go a long way in spelling out policy areas that will aid in improving performance of the tea industry and generally to stimulate performance of the economic pillar. Further, if the tea sector revenue is stabilized, the government will be able to raise

adequate revenue which can be used to finance the implementation of the Vision 2030's Flagship Projects and Programmes.

The motivation for undertaking this study is informed by the numerous challenges facing the tea sector, and specifically in regard to unstable farmers' earnings. Though a few studies have been undertaken on the tea industry, tangible solution has not been achieved. Premised on the above therefore, it is expected that research findings from this study, will articulate not only the main factors influencing tea exports earnings in Kenya but also, spell out policy recommendations that can be adopted to ensure stable tea earnings by farmers. Further, approximately 500,000 small scale farmers are engaged in production of this vital commodity FAO (2013) and in the event that they are not supported through better and a sustained tea export earnings, they are likely to abandon participation in the export trade.

1.11The organization of the Study

The rest of the paper is organized as follows: Chapter two presents a review of selected literature on tea exports and Chapter three (3) is the methodology of the research. The method of the estimation has also been articulated in Chapter three (3).

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter has been divided into three sections. The first section deals with theoretical literature review. The second section deals with reviewed earlier studies on the factors influencing tea export earnings in various places. The last section is the overview of the literature review, where a summary of the literature review is presented.

2.2 Theoretical Literature Review

This study is based on both demand and supply theories and, reviews various theories in regards to how different factors are thought to influence tea exports, either on the demand side or the supply side of the economy.

Taxes and subsidies in agriculture inevitably influence the behavior of farmers. Taxes and subsidies affect farmers' decisions on how to allocate efforts and other resources in agriculture. The most common form of influence occurs when government tax agriculture through taxing farm output directly or, equivalently by setting up a marketing agency that purchases crops at lesser price than the international price. Government can also levy export tax or by put tariffs on industrial goods such as tea. This action by government lowers prices of farm products, which reduces incentives to farmers leading to decreased agricultural exports (Stiglitz, 1987).

The World Bank study of 1985, found that incentive structure in terms of better earnings, is the most important determinant of agricultural exports. From the study, pricing policy was seen as a major limiting factor to production since domestic price was reflecting

export and import parity which is usually distorted. Further, the study indicated that SAPs which are comprised of institutional and economic measures aimed at solving macroeconomic problems, had a focus on the agricultural sector. One of the aims of SAPs was removal of overvalued exchange rates. This policy therefore improves the terms of trade for the agricultural sector as well as improving the relative prices within agricultural sector, in favor of tradable commodities (Todaro, 2009). Many developing and least developed countries depend on primary products as their source of export earnings. Primary agricultural products make up 40 percent of the exports from emerging economies and that these exports are the key source of foreign exchange to these countries (Todaro & Smith, 2005).

Inflation distorts investment in a country. In most countries, income from capital gains, interest and deductions from capital gains and depreciation, are computed in nominal terms. As a result, inflation can have a great impact on incentive for investment since the returns are of low value (Romer, 2011).

Elasticity Approach to balance of payment presents an analysis of how depreciation of exchange rate and price level will influence the BOT, depending on the elasticities of supply and demand for foreign exchange and foreign goods. Prices are assumed to be flexible and thus it is the movement of prices that determine the current account balance. Exchange rate is the most important price that is considered in this approach because it is closely linked to trade balance. The theory analyses markets of exports and imports and concludes that it is the difference between exports and imports that gives rise to a balance of payment surplus or deficit. Elasticity approach ignores income and assumes capital

movements are fixed exogenously. For this theory to work, it applies depreciation of currency. Deprecation of domestic currency increases the prices of imports in the economy making imports to be very expensive and thus discouraging imports. Elasticity approach encourages exports which corrects the current account deficit to surplus (Johnson, 1976).

Finally, conditions associated with selling on global markets are a major determinant for revenue for exporters. For instance, quality requirements can act as a stumbling block for exporters to realize benefits of the international trading system (United Nations Conference on

Trade and Development, 2002).

2.3 Empirical Literature Review

Hooy and Choong (2010) investigated the impact of the exchange rate on the world and intra-trade flows of SAARC countries. The study adopted an asymmetric, exponential generalized autoregressive conditional heteroscedasticity (EGARCH) model. The study found out that exchange rate volatility is positive and significant in determining the exports in some of the South Asian countries. The study findings are in agreement with that of Bailey et. al (1986) while investigating the impact of exchange rate on exports among the leading OECD countries (Canada, Germany, France, Japan, Italy, UK and US). These studies concentrated mainly on exchange rate and failed to look at other factors which are also important in determining export earnings.

Cushman (1983) while investigating impact of exchange rate on exports among the developed countries, and Hilton (1984) while investigating bilateral trade between West

Germany and US found a negative relationship between exchange rate and exports. Like the studies undertaken by Hooy and Choong (2010) and Bailey et. al (1986), the study by Cushman (1983) and Hilton (1984), also concentrated mainly on exchange rate and failed to look at other factors which are also important in determining export earnings.

Were et al. (2002) investigated the impact of exchange rate, investment and foreign income on Kenya's exports. The study adopted simple OLS and in their findings, exchange rate and foreign income were found to be significant in determining tea exports. Investment share in GDP was found to be insignificant in determining Kenya's tea exports. This study contradicts that by Veeramani (2008) which found exchange rate as not important in determining India's export performance. These studies failed to investigate other factors for instance value addition and inflation rate which are also important determinants of export performance.

Munyama & Todani (2005) investigated exchange rate volatility and exports in South Africa. The study adopted ARDL bounds testing using quarterly data for twenty (20) years. In this study, exchange rate was found to be positively influencing the South African export performance. The study's findings are in line with studies by Doyle (2001) and Morgenroth (2000) who found a positive relationship between export performance and exchange rate. These studies investigated Irish' exports to Britain. These studies left a room for further research since they majorly investigated the impact of exchange rate on export performance yet there are other factors that may be in play.

Krueger, Schiff and Valdes (1988) found out that policies such as exchange rate policies have negatively affected the agricultural production. He observed that many developing

countries suppress agricultural commodity price through government procurement policies, export quotas and exports taxation thus a disincentive to local agricultural production, which leads to decrease in agricultural exports and eventually resulting to decreased export earnings. This study however, failed to take note of the impact of foreign country economic activity which may have an influence on export earnings.

Jaeger & Humphrey (1988) investigated impact of macro-economic policies such as exchange rate policies, trade policies on farmer's real income. In his findings, he observed that the above mentioned policies influence the terms of trade between tradable and non-tradable commodities. The study indicates that overvaluation of exchange rate in developing countries, makes domestic products including agricultural produce, more expensive and hence less profitable. This study however contradicts a study by Wang and Barrett (2002) while investigating the impact of exchange rate movement on Taiwan's exports to the United States from 1989-1999. In their findings, they observed that movements in the exchange are insignificant in determining country's exports. These studies left a room for further research, on the factors that influence country's exports, since all the factors were not analyzed exhaustively.

Shane, Roe & Somwaru (2008) investigated macroeconomic determinants of the US agricultural exports. The study found that growth in demand for US agricultural exports is influenced by growth in real income of the trading partner. The study further indicates that devaluation of the US dollar results to increase in US agricultural exports. This study concurs with a study by Schuh (1974) which argues that a major part of the farm problem of the 1950s could be attributed to an overvalued dollar, which depressed agricultural

prices and exports. This study however, left a room for further research in other jurisdictions since US and other areas could have different economic conditions.

Jebuni, et al. (1991) studied exchange rate policy and macroeconomic performance in Ghana by looking at the price of tradables and price of non-tradables. In his findings, real exchange rate was found to be positive and significant in influencing macroeconomic performance of Ghana. A study by Kasekende and Ssemogerere (1994) while investigating effects of exchange rate on macroeconomic performance in Uganda found similar results. Further, Cline (2004) investigated effect of exchange rate on export growth of the developing countries using OLS. In his findings, exchange rate was found to be significant and positive in influencing export growth. His results are in agreement with earlier studies by Jebuni, et al. (1991) and Kasekende and Ssemogerere (1994). These studies left a room for further research, since only exchange rate was examined, and thus other factors that influence country's exports, were not analyzed exhaustively.

Muthamia and Muturi (2015) investigated determinants of earnings from tea export in Kenya using OLS. The study used time series data running from 1980 to 2011. In their findings, real exchange rate, foreign income, price of tea, agriculture value addition and export of goods and services significantly influence tea earnings in Kenya. The study further found that inflation insignificantly affects tea earnings in Kenya. This study will investigate the impact of volume of tea exports on tea export earnings contrary to Muthamia and Muturi (2015) who considered export of goods and services. The volume of goods and services exports may not clearly present the impact of tea exports on tea earnings since other export products are included.

Maugu et al. (2013) used disequilibrium model of agricultural crop export to investigate factors that influence supply of Kenya's major agricultural crop exports. The study used time series data running from 1963 to 2012. The study's findings indicate that tea, pyrethrum and horticultural exports are significantly influenced by exchange rate. The findings also indicate that GDP significantly influence tea, coffee and aggregate exports. El-nino which is captured by a dummy variable significantly affects pyrethrum exports. This study intends to improve the study by Maugu et al. (2013) by mainly focusing on tea exports since tea is the leading crop export in Kenya.

Rutto and Ondiek (2014) investigated impact of exchange rate volatility on Kenya's tea exports using OLS. The study used time series data running from 1970 to 2008. The findings of the study indicate that exchange rate volatility negatively influence Kenya's tea export performance. This study intends to improve the study by Rutto and Ondiek (2014) by investigating other factors which influence tea export earnings in Kenya.

2.4 Overview of Literature

From the literature reviewed, it is clear that varied approaches have been applied in analyzing factors influencing tea export earnings. The literature has revealed that tea export earnings are influenced by foreign income, inflation rate, exchange rate and investment share in GDP. Most of the earlier researchers have identified exchange rate, foreign income, price of tea, agriculture value addition, export of goods and services, inflation and Investment share in the GDP as the factors which influence tea export earnings. However, export of goods and services may not give clear impact of the volume of tea exports on tea export earnings since the variable include both crop and non-crop

exports. Additionally, recent developments that have taken place in the tea sector, for instance, change in the institutional framework of the agricultural sector in Kenya inform the need for a detailed study on tea export earnings. Further, tea farmers in Kenya have complained of poor earnings which justify the need for a thorough investigation of the determinants of tea export earnings.

This study therefore seeks to adopt a more comprehensive approach, through studying of various factors which influence the tea export earnings in Kenya. This study will apply longitudinal data to evaluate tea export earnings and inform what needs to be done to improve the earnings.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents the conceptual framework, modeling and data analysis. The conceptual framework provided will be helpful in analyzing data. It will also give direction towards the achievement of the set objectives. The chapter further illustrates the various tests performed to ascertain the validity of data.

3.2 Theoretical Framework

Equations of trade are normally equations of time series behavior of quantities and prices of exports and imports. Such equations relies on factors such as the type of good being traded, its final use, institutional framework under which trade occurs, purpose of the modeling exercise, as well as availability of data (Goldstein and Khan, 1985).

Theory suggests that export or import demand and supply equations should be simultaneously solved in order to emphasize the relation between quantities and prices, to avoid possible biased results (Stern, Francis and Schumacher, 1976). However, most of the empirical studies have been concentrated on the estimation of export and import demand equations, while the supply relationships have been handled by the assumption of infinite price elasticity. Infinite price elasticity may be justified in the case of import supply but in the case of small open economy, it is quite hard to believe that infinite price elasticity of export supply holds. Normally, if the world's demand for the goods from a certain small open economy increases, this country will most probably be unable to meet the demand without the change in price of exports, unless there exist large idle resources

(Goldstein and Khan, 1985). Based on the above argument, export and import demand equation can be estimated by single-equation methods in which the price variables are exogenous.

Export demand equation, according to the theoretical concepts, should be specified as a function in which the quantity demanded is explained by the income level of potential importing regions, exported goods' own price and price of imperfect substitutes in the importing country. Other export demand equations for a specific country, test explanatory variables such as dummy variables for unusual occurrences, seasonal variables, lagged variables aimed to capture responses in time, foreign exchange reserves, credits and other variables that take into account special circumstances which may be incorporated as independent variables as well (Stern, Francis and Schumacher, 1976).

Consequently, the conventional model for estimating export demand equation suggests the following relation.

$$Qx = f(Y, Px, Pq)$$

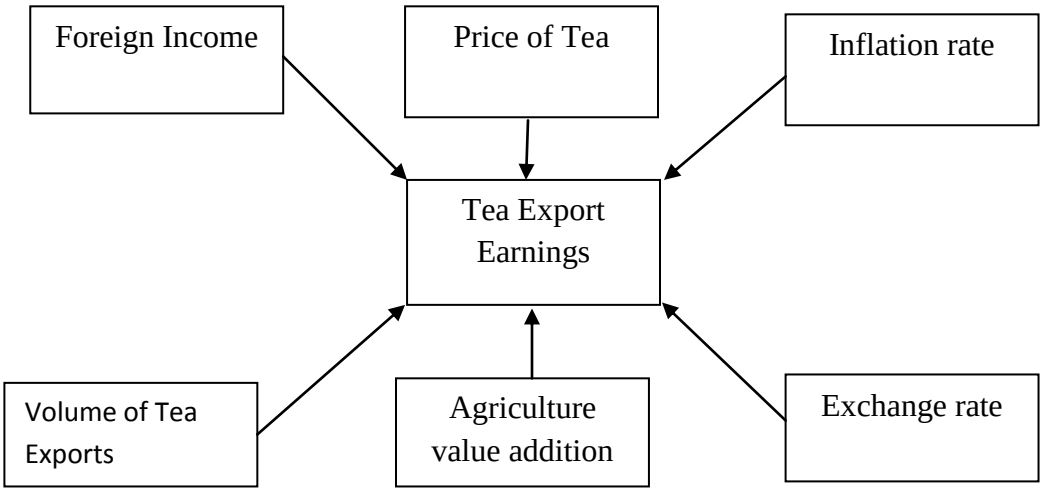
Where Qx is quantity of exports, Y is foreign income of the importing region, Px is exported goods' own price and Pq is price of imperfect substitutes in foreign country. Usually the above function is of imperfect substitutes on the foreign market.

3.3 Conceptual Framework

The Conceptual Framework shows the relationship between dependent variable and independent variables. This conceptual framework will therefore be helpful, as it will serve as a benchmark of developing the methodology of this study. The developed methodology will guide in coming up with findings on how the Kenya's tea export

earnings have been influenced by various factors over time. On the basis of literature reviewed, tea export earnings are affected by price of tea, foreign income, inflation rate, exchange rate, export of goods and services and agriculture value addition. This study will incorporate volume of tea export instead of exports of goods and services in addition to the variables articulated in the literature review. The relationship between dependent and independent variables is as shown in figure 1.5 below:-

Figure 1.5: Relationship among Variables



Source: Author's Representation

3.4 Model Specification

Rutto and Ondiek (2014) and Muthamia and Muturi (2015) used OLS model to explain the relationship between Kenya's tea exports and the various factors. Were et al. (2002) also investigated factors influencing export performance in Kenya using OLS. According to the studies, exchange rate, foreign income, price of tea, agriculture value addition, export of goods and services, inflation and Investment share in the GDP determine

exports earnings in Kenya. This study therefore uses the same model but use volume of tea exports instead of export of goods and services since it gives a clear impact of tea exports on tea export earnings. The Specific model is therefore as shown below:-

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

Where, Y is tea exports earnings, X_1 is exchange rate, X_2 is inflation rate, X_3 is foreign income, X_4 is the Agriculture Value addition, X_5 is the price of tea and X_6 is the volume of tea export. The coefficients β_0, β_1, β_2, β_3, β_4, β_5 and β_6 are parameters to be estimated while μ is the error term.

3.5 Variables

3.5.1 Dependent variable. The dependent variable for this study is the Tea Export Earnings.

3.5.1.1 Tea Export Earnings

This is a variable that is used to indicate how the tea sub-sector is performing in the Kenyan economy. It is obtained by summing the income that all farmers obtain from the tea exports.

3.5.2 Independent Variables. A number of factors are assumed to influence the tea export earnings. These factors include:-

3.5.2.1 Exchange Rate

Exchange rate is a key determinant of a country's exports. Depreciation of the currency makes exports more competitive and appear cheaper to foreigners. Generally, a higher exchange rate is expected to have a positive impact on the tea export earnings.

3.5.2.2 Inflation Rate

Inflation makes exports to appear more expensive in foreign country. Increased inflation therefore results to a decrease in volume of exports. Generally, a rise in inflation rate is expected to have a negative impact on the tea export earnings.

3.5.2.3 Foreign Income

Foreign income is important in determining any country exports. According to Mudida (2003) an increase in income, will lead to an increase in demand for a commodity, provided that it is a normal good. This implies that if the income of the foreigners increases, demand for Kenyan tea will increase, thus increasing exports. Generally, an increase in foreign income is expected to have a positive impact on the tea export earnings.

3.5.2.4 Agriculture Value Addition

Value addition to a country's primary export products is a key determinant of tea export earnings. Value addition leads to improved quality thus making country's exports competitive (AFFA, 2015). Generally, agriculture value addition is expected to have a positive impact on the tea export earnings.

3.5.2.5 Price of Tea

Price is an important determinant of the quantity supplied. According to economic theory, higher prices result to higher quantity supplied. Thus if prices of tea are high, then many farmers will be encouraged to participate in tea farming thus increasing the country's tea export earnings.

3.5.2.6 Volume of Tea Exports

Volume of exports is an important determinant of a country's tea export earnings. According to economic theory, supply increases with an increase in price. We therefore assume that increase in volume of tea exports is triggered by better pay thus resulting to increased tea earnings. We therefore expect volume of tea to have a positive impact on tea export earnings.

Table 1.1 below summarizes the expected signs of the explanatory variables:-

Table 1.1: Postulated signs of the coefficients of explanatory variables

Dependent variable	**Explanatory Variables**	**Expected Sign**
Tea Export Earnings	Exchange Rate	+
	Inflation Rate	-
	Foreign Income	+
	Agriculture Value Addition	+
	Price of Tea	+
	Volume of Tea Exports	+

Source: Author's Representation

3.6 Data source and Description

The study applies time series data running from 1973 to 2013. This period was preferred due to availability of variables that have been measured consistently. The variable of great interest is the tea export earnings. This variable is obtained from the Kenya National Bureau of Statistics publications. The independent variables which include exchange rate, inflation rate, foreign income and Agriculture Value addition, are obtained from the World Bank, World Development Indicators (WBWDI). Data on the Price of tea and volume of tea exports are obtained from the Kenya National Bureau of Statistics publications.

3.7 Estimation Technique

The study uses ordinary least squares (OLS) in establishing the relationship between tea exports earnings and the regressors. OLS is the preferred estimation technique since it is straightforward and is easy to understand. However for OLS to be used, assumptions of classical linear regression model must hold. Stata version 12 will be the preferred econometric package to run the required regressions since it is easier to understand and can handle time series data.

3.8 Diagnostic Tests

3.8.1 Heteroscedasticity

Heteroscedasticity refers to a situation where variance of the error term varies with change in the number of observation. Presence of heteroscedasticity does not have an impact on the unbiasedness and linearity of the regression coefficient since it only affects

the best property of OLS, which renders the conclusion made while testing hypothesis invalid (Gujarati, 2004). The study therefore tests for heteroscedasticity using Breusch-Pagan test.

3.8.2 Autocorrelation

Autocorrelation refers to a case where error term is related to its preceding value. Presence autocorrelation however, do not affect the unbiasedness of the estimates but render hypothesis testing inapplicable. Autocorrelation occurs mostly in time series data. The reason behind this is the fact that such data assumes a certain trend as the time changes. Autocorrelation does not affect the unbiasedness, linearity and asymptotic nature of the estimators. The only problem is that it violates the Best property of OLS which makes conclusion hypothesis testing wrong. This study therefore uses Breusch Godfrey test to check whether data experience serial autocorrelation (Gujarati, 2004).

3.8.3 Multicollinearity

Multicollinearity is also common in time series data since variables may be following a particular trend. Multicollinearity refers to a situation where some of the explanatory variables are related. The variables may be increasing or decreasing over time. Multicollinearity makes the coefficient of regression to be indeterminate. In this study, exchange rate and inflation rate are the variables likely to be related. This is based on the fact that increased exchange rate results to a higher aggregate demand which causes demand pull inflation. Multicollinearity may be common among variables, but what matters is the degree (Gujarati, 2004). To check for the presence of multicollinearity, the study uses the variance inflation factors (VIF) test (Nachtscheim, 2004).

3.8.4 Stationarity Test

Stationarity refers to a case where the mean of the data is time independent. Unit root tests are used to detect non stationarity in all the variables. If variables are non-stationary, there is a tendency of the estimates to change over time. This characteristic leads to spurious estimates. Therefore, if variables are found to be non-stationary, successful differencing is applied until the bias is eliminated. The null hypothesis in this case is that the variable under consideration is non-stationary. Augmented Dickey Fuller (ADF) test is used in testing for stationarity (Gujarati, 2004).

3.8.5 Cointegration

Other than stationarity of the variables, there is a need to have a long-run relationship between the dependent variable and explanatory variables, a notion called Cointegration. In the absence of Cointegration, the forecasting power of the model will be compromised. The Engle- Granger test is employed to this effect (Gujarati, 2004).

CHAPTER FOUR: EMPIRICAL RESULTS

4.1 Introduction

In this chapter, results of empirical analysis are presented. The chapter discusses descriptive statistics of the data, diagnostic tests and report on the regression results.

4.2 Descriptive Statistics

Table 1.2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Y	41	26038.78	30759.26	340.98	104648
X_1	41	43.39875	30.53195	7.020384	88.81077
X_2	41	0.1042218	0.0720478	0.0093321	0.4198877
X_3	41	481.7875	292.2455	92.62797	1240.873
X_4	41	31.38055	3.520608	25.0112	41.951
X_5	41	89.25488	76.20209	6.59	269
X_6	41	202245.2	115984.2	49595	446033

The total observations considered in this study were 41 with seven variables (one dependent and six independent variables). Tea exports revenue deviates from its mean (KES 26038.78 million) by KES 30759.26 million but ranging between KES 340.98 million and KES 104648 million. Exchange rate deviates from its mean (43.39875) by 30.53195 but ranging between 7.020384 and 88.81077. In general the standard deviation for each variable indicates the value by which a given variable deviates from its mean. Among the variables under study, inflation rate has the least standard deviation, an

indication that it does not deviate much from its mean. Volume of tea exports has the largest deviation indicating that it deviates much from the mean.

4.3 Correlation Matrix

Correlation of the variables is examined in the table shown below.

Table 1.3: Correlation matrix

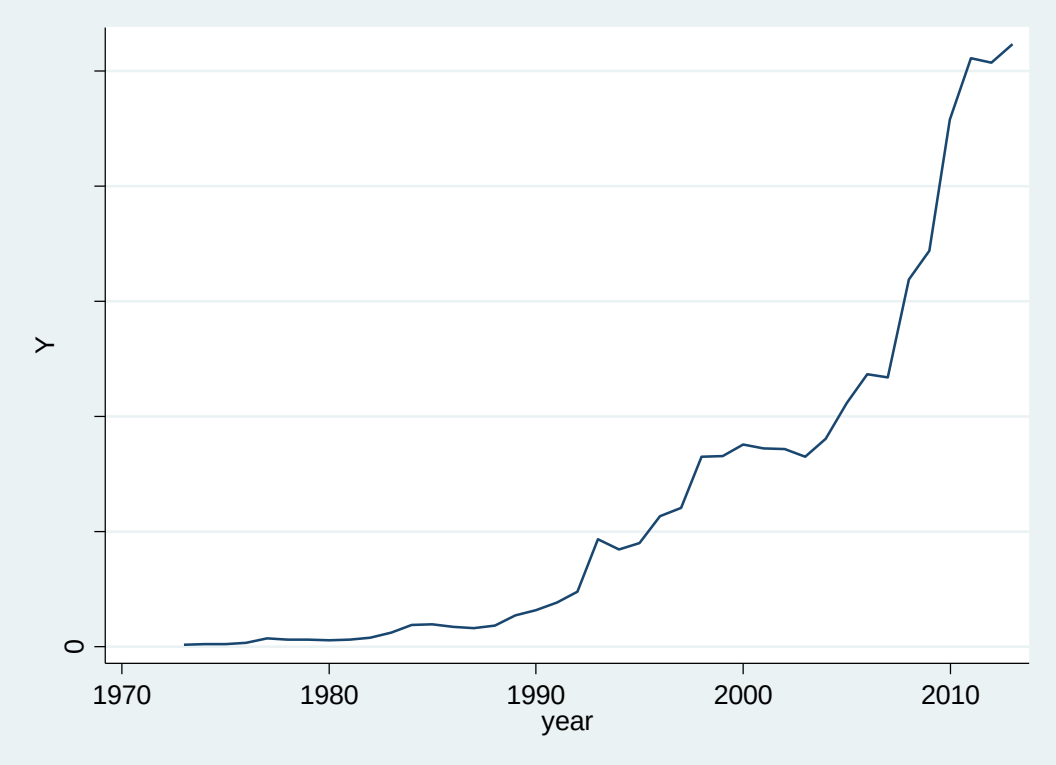
Variables	**Y**	**X_1**	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**
Y	1.0000						
X_1	0.8441	1.0000					
X_2	-0.2141	-0.1708	1.0000				
X_3	0.9626	0.7792	-0.1875	1.0000			
X_4	-0.6812	-0.7139	0.0797	-0.7442	1.0000		
X_5	0.9688	0.9274	-0.1929	0.9179	-0.7085	1.0000	
X_6	0.9215	0.9243	-0.1987	0.9089	-0.7889	0.9259	1.0000

From Table 1.3 above, we observe the relationship existing between various variables used by this study. There is a positive association between tea exports revenue and exchange rate, foreign income, price of tea and volume of tea exports whereas other variables exhibit negative association with tea export revenue. Exchange rate has a positive association with foreign income, price of tea and volume of tea exports have a positive association, while inflation rate and price of tea have a negative association. Exchange rate has a negative association with agriculture value addition. Foreign income has a positive association with price of tea and volume of tea exports. Price of tea has a positive association with volume of tea exports.

4.4 Trends in the Economic Variables Used in the Study

This section analyses the movements in the variables under study. The trend runs from 1973 to 2013. To illustrate these trends, line graphs have been used.

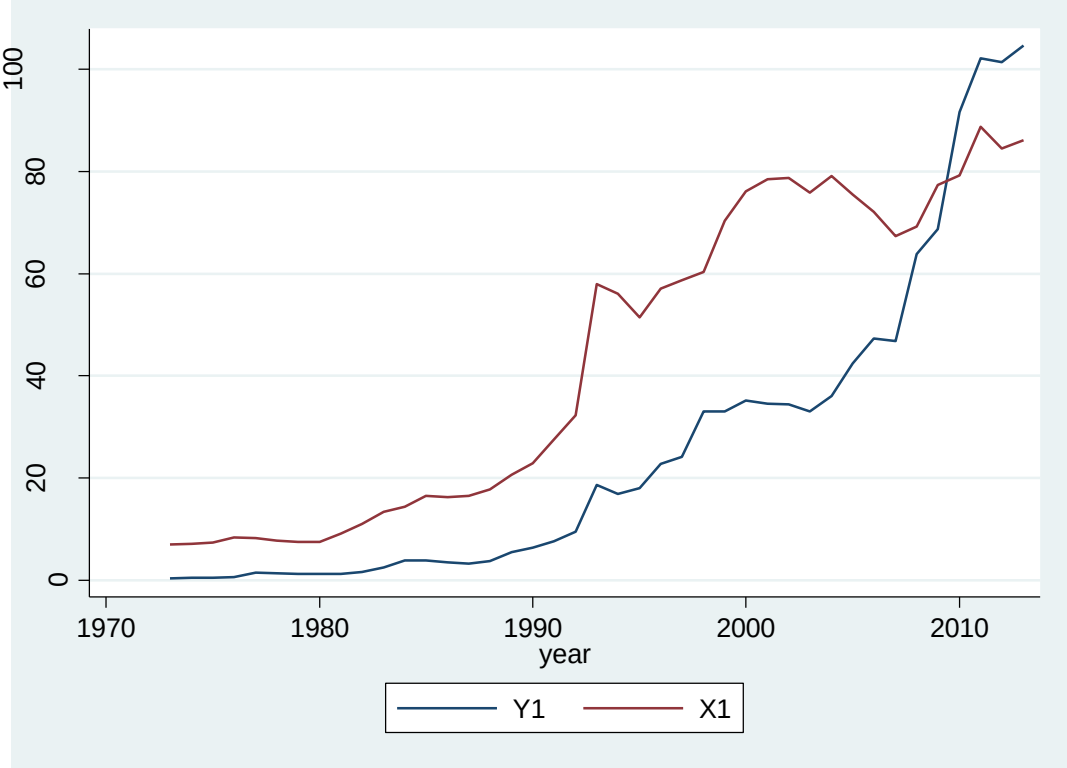
Figure 1.6: Trends in the Tea Export Earnings



From the above line graph, it can be observed that tea export earnings in Kenya have been increasing overtime with little fluctuations. The highest levels were reached in 2013. The increase in Tea export earnings in Kenya can be linked to the Kenya tea Board 2000 strategic plan which was aimed at marketing and promoting Kenyan tea in order to obtain maximum returns (TBK, 2012). In addition the positive trend in tea export earnings may be linked to high quality and bright colour of the Kenyan tea. According to Export

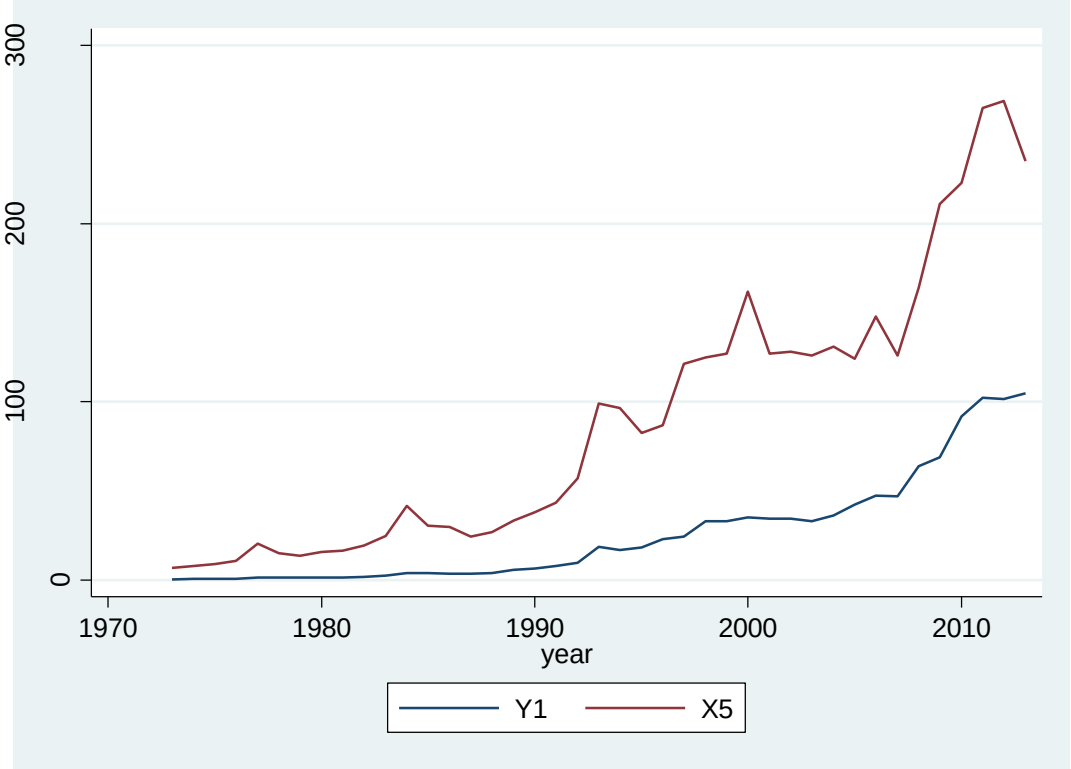
Promotion Council (2011), high quality and bright colour of Kenyan tea has increased its demand in the international market since it is used to blend other tea in the global market.

Figure 1.7: Trends in the Tea Export Earnings and Exchange Rate



From above line graph, it can be observed that export earnings increase with an increase in exchange rate. This trend conforms to economic theory which states that an increase in exchange rate makes a country exports to appear cheaper for foreigners therefore increasing the demand for the exports. The trend indicates that demand for Kenyan tea increased thus leading to an increasing trend in tea exports earnings for the study period.

Figure 1.8: Trends in the Tea Export Earnings and Price of tea



From above line graph, it can be observed that export earnings increase with an increase price of tea. This trend conforms to economic theory since if price increase then earnings should increase assuming the amount exported does not decrease.

4.5 Diagnostic Tests

4.5.1 Stationarity Test

Stationarity means the variable is integrated of order zero and therefore inference is applicable. However, presence of a unit root lead to spurious regression renders hypothesis testing invalid. The unit root test was done by applying Augmented Dickey Fuller Test on the individual variables. All tests were run at 5% significance level. Table results are as shown in Table 1.4 below:-

Table 1.4 Augmented Dickey Fuller Unit Test Statistics in Absolute Values

Variable	**ADF in levels 5% CV=2.958**	**ADF in 1st Difference 5% CV=2.961**	**Order of Integration**
Y	2.874	4.835	1
X_1	0.267	5.794	1
X_2	4.413		0
X_3	2.691		0
X_4	1.811	5.56	1
X_5	0.097	6.03	1
X_6	0.086	10.928	1

It is evident from Table 1.4 above, that variables X_2 and X_3 were stationary at levels while variables Y, X_1, X_4, X_5 and X_6 were stationary at first differences. The variables which were integrated of order one i.e I (1) were found to be integrated of order zero i.e I (0) at 5% level of significance after differencing once.

4.5.2 Heteroscedasticity

Using Breusch-Pagan test, results reveal that the variances of the random error terms are constant across observations since the p-value of 0.7049 (See Table 1.5) leads to failure to reject the null hypothesis of homoscedasticity. This confirms absence of heteroscedasticity.

Table 1.5: Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity
Ho: Constant variance
Variables: Fitted values of Tea exports Earnings
chi2(1) = 0.14
Prob> chi2 = 0.7049

4.5.3 Autocorrelation

Breusch Godfrey test was applied in testing for serial autocorrelation. The test results confirmed presence of serial autocorrelation since the p-value of 0.0013 (See Table 1.6) we reject null hypothesis indication presence of autocorrelation. As a remedy to this bias, robust standard errors will be used.

Table 1.6: Test for Autocorrelation

Breusch-Godfrey LM test for autocorrelation			
lags(p)	chi2	df	Prob> chi2
1	10.364	1	0.0013
H_0: no serial correlation			

There is absence of serial autocorrelation. We reject the null hypothesis

4.5.4 Multicollinearity

To test for multicollinearity, Variance Inflation Factors (VIF) was examined. For VIF values greater than 10, multicollinearity is deemed to be present (Nachtscheim, 2004). All the variables except price of tea and volume of tea exports had VIF greater than 10 (see Table 1.7(a)). To solve this, we differenced the variables with VIF greater than 10 and the results in Table 1.7(b) indicate that Multicollinearity is solved since all variables have VIF of less than 10.

Table 1.7(a): Test for Multicollinearity

Variance Inflation Factors

$$VIF = \frac{1}{1 - R^2}$$

Where VIF= variance inflation factor

R^2= coefficient of determination

1/VIF= tolerance

Variable	**VIF**	**1/VIF**
X_1	34.43	0.029041
X_2	29.44	0.039520
X_3	25.30	0.039520
X_4	24.96	0.040056
X_5	2.93	0.341405
X_6	1.06	0.940631
Mean VIF	19.69	

Table 1.7(b): Test for Multicollinearity

Variable	VIF	1/VIF
$D.X_1$	1.78	0.562286
$D.X_2$	1.29	0.777310
$D.X_3$	1.40	0.715673
$D.X_4$	1.46	0.684023
X_5	3.11	0.322001
X_6	1.88	0.531386
Mean VIF	1.82	

4.5.5 Cointegration Test

Variables are cointegrated if they have a long term equilibrium relationship. Most of the time when economic variables are individually non-stationary; it is likely that cointegration may occur. A test of cointegration is thought of as a pre-test to avoid spurious regression situations. Thus cointegration relationship existence implies that the regression of non-stationary series in their levels yield meaningful and not spurious results. However, it is worth noting that for cointegration to exist the non-stationary series must be integrated of the same order as in this study is integrated of order one.

To test for cointegration, the study employed Engel-Granger (1987) test. The results are as shown in Table 1.8 below:-

Table 1.8: Test for Cointegration

Engle- Granger Test

Number of obs = 39
F(2, 36) = 416.82
Prob > F = 0.0000
R-squared = 0.9731
Root MSE = 5105.1

Res	Coefficient	Res, robust	t	P	[95% Conf Interval]
Res					
L1.	1.047859	0.0511502	20.49	0.000	0.944121 1.1516
LD.	0.0350346	0.2138485	0.16	0.871	-0.3986701 0.4687
Constant	1439.304	855.2678	1.68	0.101	-295.259 3173.867

It is evident from Table 1.8, that there is cointegration since the value of p is 0.000<0.05. This shows that regression of the non-stationary series in their levels will yield meaningful and not spurious results.

4.6 Empirical Findings

Table 1.9: Regression Results in Levels

Linear regression				Number of obs= 41 F(6,34)= 307.35 Prob> F=0.0000 R-squared= 0.9857 Root MSE= 3990.4	
Y	Coefficients	Robust Std. Err.	t	P>t	[95% Conf.Interval]
X_1	-451.0196	110.8184	-4.07	0.000	-676.2297 -225.8095
X_2	-3726.942	4861.299	-0.77	0.449	-13606.29 6152.406
X_3	17.77099	11.2726	1.58	0.124	-5.137678 40.67967
X_4	835.9734	320.6788	2.61	0.013	184.2756 1487.671
X_5	375.1051	53.52859	7.01	0.001	266.3219 483.8883
X_6	1.699823	.0237845	4.41	0.000	0.0564528 0.1531245
cons	-43467.21	12649.1	-3.44	0.002	-69173.28 -17761.15

4.7 Interpretation of the Results

The results above indicate that regression did well in regard to the goodness of fit and also overall significance with an R^2 of 98.57%. This implies that 98.57% of the variation in the Tea export earnings is explained by the explanatory variables in the model.

The results further shows that when all the independent variables in the model assume the value of zero, tea export earnings will be -43467.21. Holding all other factors constant, tea export earnings will decrease by 451.0196 units when exchange rate increases by one unit. When all other factors are held constant, tea export earnings will reduce by 3726.942 units when inflation rate increases by one unit. When all other factors are held constant, tea export earnings will increase by 17.77099 units when foreign income

increases by one unit. When all other factors are held constant, tea export earnings will increase by 835.9734 units when agriculture value addition increases by one unit. Holding other factors constant, tea export earnings will increase by 375.1051 units when price of tea is increased by one unit. Finally, tea export earnings will increase by 1.699823 units when volume of tea is increased by one unit, holding other factors constant.

4.8 Discussion of the Findings

The coefficient of exchange rate is negative and significant in determining tea exports earnings in Kenya. The results conform to economic theory if we consider the fact that some of the inputs used in tea farming are imported. Higher exchange rate may thus result to decline in production and eventually leading to decreased tea export earnings. These results are also in agreement with Cushman (1983) and Hilton (1984). However, the results contradicts Bailey et al. (1986), Munyama and Todani (2005), Morgenroth (2000) and Doyle (2001) studies which found a positive relationship between exchange rate and tea export earnings.

The coefficient of inflation is negative and insignificant in determining tea exports earnings in Kenya. The results conform to economic theory since inflation discourages investment. This means increased inflation discourage investment in tea which results to a decreased in tea export earnings. These results are also in agreement with Muthamia and Muturi (2015).

The coefficient of foreign income is positive and insignificant in determining tea exports earnings in Kenya. The results conform to economic theory if tea is considered as a normal good. Higher foreign income will result to increased demand for Kenyan tea thus resulting to increased tea export earnings. These results are in agreement with Were et al. (1983) and Shane, Roe and Somwaru (2008).

The coefficient of price of tea is positive and significant in determining tea exports earnings in Kenya. The results conform to economic theory since high price can act as incentive to increased supply of tea for exports thus resulting to increased tea export earnings. These results are also in agreement with Muthamia and Muturi (2015).

The coefficient of volume of tea exports is positive and significant in determining tea exports earnings in Kenya. The results conform to economic theory since higher volume of tea exports will lead to increased tea export earnings assuming prices remain unchanged.

The coefficient of agriculture value addition is positive and significant in determining tea exports earnings in Kenya. The results conform to economic theory since high quality exports results to increased income to a country. These results are also in agreement with Muthamia and Muturi (2015).

We can therefore conclude that over the period under which the study has been undertaken, the key determinants of tea export earnings in Kenya in the long run are; exchange rate, agriculture value addition, price of tea and volume of tea exports.

Table 1.10: Regression Results in First Difference

Linear regression				Number of obs = 40 F(6,33) = 15.72 Prob> F = 0.0000 R-squared = 0.8405 Root MSE = 2170	
D.Y	Coefficients	Robust Std. Err.	t	P>t	[95% Conf.Interval]
$D.X_1$	-79.44292	121.9124	-0.65	0.519	-327.4755 168.5896
$D.X_2$	-7136.042	4303.735	-1.66	0.107	-15892.06 1619.973
$D.X_3$	18.26861	7.205755	2.54	0.016	3.608391 32.92883
$D.X_4$	-98.45383	196.2917	-0.50	0.619	-497.8124 300.9047
$D.X_5$	292.6422	51.46787	5.69	0.000	187.9301 397.3544
$D.X_6$	0.1538834	51.46787	5.44	0.000	0.096294 0.2114728
cons	-969.3591	458.6556	-2.11	0.0042	-1902.501 -36.2173

The short run regression performed well in terms of goodness of fit with an R^2 of 84.05%. This implies that 84.05% of the variation in the tea export earnings is explained by the explanatory variables in the model. As depicted in the diagnostic tests, heteroscedasticity was absent whereas autocorrelation, multicollinearity and non-stationarity among some variables were detected. However, these were corrected. The short run dynamic allowed us to make some meaningful interpretation of the dynamic process. All the variables are jointly significant in the short run as indicated by the F statistic. Some of the variables as depicted in table 1.10 above, are statistically significant. Thus with such results, the study can discuss the issue of concern.

The coefficient of exchange rate as it was in the long run regression remained negative but statistically insignificant at 5% level of significance. This concurs with findings of Cushman (1983) and Hilton (1984) who found a negative relationship between exchange rate and tea export earnings.

Contrary to the long run regression results, foreign income becomes significant in determining Kenya's tea export earnings at 5% level of significance. This is in line with Were et al. (1983) and Shane, Roe and Somwaru (2008) findings. Further, agriculture value addition becomes insignificant contrary to the long run regression results where it was significant at 5% level of significance.

The coefficient of price of tea and volume of tea exports remain unchanged and significance both in the long run regression and in the short run regression.

CHAPTER FIVE: CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Summary and Conclusion

The study has investigated the factors that determine tea export earnings in Kenya over the period 1973-2013. The linear regression model as used by Muthamia and Muturi ((2015) was adopted in estimating the relationship between tea export earnings and the explanatory variables. Pre-estimation tests have been undertaken and the OLS method of data analysis was adopted.

The study's findings show that tea export earnings in Kenya are determined by exchange rate, agriculture value addition, price of tea and volume of tea exports. Agriculture value addition, Price of tea and volume of tea exports were established to be positive and statistically significant in determining tea export earnings at 5% level of significance. Exchange rate is established to be negative and significant in determining tea export earnings at 5 percent level of significance.

5.2 Policy Implications

Our investigation has evidently elaborated that at aggregate level, Kenya's tea export earnings is determined by various factors. These factors include exchange rate, agriculture value addition, price of tea and volume of exports. The impact of each of these variables on Kenya's tea export earnings differs in sign and degree. Not all the variables under investigation are statistically significant in determining tea export earnings in Kenya. These findings therefore provide a pool of information for policy makers in Kenya.

According to the study results, the government of Kenya should aim at maintain those factors that positively affect its tea export earnings. It should also try to minimize those that negatively affect export earnings. With regard to the positive relationship between tea export earnings, agriculture value addition, price of tea and volume of tea export earnings, the government should ensure these areas are strengthened for it to obtain high tea export earnings. For instance, the government should stimulate legislation of laws that will provide inputs at subsidized rates and credit to tea growing areas. Such initiative will increase volume of tea produced in Kenya for exports. The government through the Ministry of Foreign Affairs and International Trade should market the Kenyan tea to many foreign countries. Such action will increase demand thus resulting to better prices. In addition, the government through Competition Authority of Kenya should ensure anticompetitive conduct at Mombasa Tea Auction is removed so as to allow the market to determine the price for tea. With regard to value addition, the government should aim at exporting processed tea instead of exporting tea at its primary stage. With regard to exchange rate, the government should ensure there are sound monetary and fiscal policies to cushion exchange rate from constant fluctuations.

5.3 Limitations of the Study

The study did not investigate all the variables affecting tea export earnings in Kenya. For instance, weather and reforms in the tea sector are likely to have an impact on the performance of tea export earnings. The two variables are important determinants of tea export earnings and hence need to be included in the model in a further study.

5.4 Areas for Further Study

Future study can include weather and reforms in the tea sector in the model to be able to examine to what degree weather and reforms in tea affect tea export earnings in Kenya. Thus variables which have not been examined in this study can be investigated by future researchers.

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ANNEX I : DATA USED

Year	Y	X_1	X_2	X_3	X_4	X_5	X_6
1973	340.98	7.020383688	0.102038	92.62797	35.46295757	6.59	51742
1974	387.83	7.134811101	0.160493	124.9597	35.36322965	7.82	49595
1975	457.89	7.343193332	0.118351	152.2524	34.15437003	8.73	52450
1976	635.3	8.367144999	0.189062	178.1856	37.90314138	10.72	59263
1977	1435.3	8.276560832	0.168998	199.7233	41.95099653	20.44	70220
1978	1263.47	7.729383332	0.03081	237.9453	36.92241142	14.87	84968
1979	1257.09	7.475309166	0.056386	254.9554	34.59571119	13.37	94023
1980	1160.13	7.420187499	0.095507	295.3507	32.59223737	15.51	74799
1981	1221.34	9.047498333	0.108531	340.3335	32.49981199	16.19	75438
1982	1559.1974	10.922325	0.115926	356.961	33.36459631	19.4	80371
1983	2468.47	13.31151667	0.11838	333.1313	33.36459631	24.7	99938
1984	3789.28	14.413875	0.101907	345.6762	34.21953403	41.55	91198
1985	3833.3	16.43211667	0.083058	329.9351	33.97064135	30.33	126303
1986	3455.25	16.22574167	0.087117	308.414	32.59379147	29.67	116456
1987	3267.4	16.45449167	0.05402	325.379	33.04248714	24.27	134627
1988	3705.17	17.7471	0.064556	358.2852	31.54722807	26.81	138201
1989	5437.19	20.57246667	0.09769	360.854	29.89012658	33.3	163279
1990	6290.11	22.91476667	0.106372	347.5274	30.1853349	37.8	166405
1991	7633.22	27.50786667	0.12532	376.8713	29.5185789	43.48	166405
1992	9498.19	32.21683333	0.188972	385.0221	28.14057919	57.04	166518
1993	18674	58.00133333	0.256985	397.3572	28.73904781	99.1	188435
1994	16882	56.050575	0.170164	389.5471	31.52343009	96.51	174926
1995	17989	51.42983333	0.112211	447.0743	33.32094939	82.54	217937
1996	22704	57.11486667	0.419888	446.6239	31.13312868	86.61	262146
1997	24126	58.73184167	0.114352	427.5334	30.7391782	121.1	199224
1998	32971	60.3667	0.069314	415.7771	30.9053427	125	263771

1999	33065	70.32621667	0.041939	411.9947	31.23148551	127	260177
2000	35150	76.17554167	0.060798	462.4449	32.38384385	162	217282
2001	34485	78.563195	0.015731	442.507	32.36397421	127	270473
2002	34376	78.74914167	0.009332	443.5218	31.33007599	128	272700
2003	33005	75.93556944	0.061973	508.2831	29.13061411	126	262175
2004	36072	79.17387606	0.071268	582.699	29.0290549	131	275307
2005	42372	75.55410945	0.048996	625.9437	28.04234626	124	341171
2006	47349	72.10083502	0.077867	770.4125	27.19868287	148	318896
2007	46754	67.31763812	0.056148	838.9222	26.75702888	126	370245
2008	63812	69.17531982	0.132124	910.0062	25.01120041	164	390003
2009	68766	77.3520123	0.097393	930.4705	25.84179025	211	326497
2010	91617	79.2331517	0.022471	970.4722	27.17260504	223	410035
2011	102236	88.81076997	0.135409	1167.38	25.11130142	265	385425
2012	101441	84.52960176	0.068236	1219.053	28.47890245	269	376996
2013	104,648	86.1228789	0.057	1240.873	29.87638126	235	446033