The Impact of Exchange rates and Inflation rate on the marketed returns to Suppliers in the Kenyan Tea industry

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Submitted in partial fulfillment of the requirements for the Degree of Bachelor of Business Sciences – Finance at Strathmore University

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March, 2016

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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This Research Project has been submitted for examination with my approval as the Supervisor.

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Introduction

Tea production and processing is a focal sector in the Kenyan agricultural sector with its' being the largest foreign exchange earner in the sector and thus a key contributor to the country's GDP. The tea sector is also a key employer with 150,000 Kenyans employed and a key income source with over 600,000 farmers.

The Agriculture sector performed well from independence accounting for 40% of GDP in 1963. Its significance in the economy has been declining over time accounting for 27.3% of the country's GDP in the year 2014 (KNBS, 2015) however despite the decline in significance, the sector remains the leading contributor of GDP in Kenya. Tea was the second leading export commodity earner of the country contributing 20.4% of total export value in 2014 (KNBS, 2015). Kenya is the largest exporter of tea by volume producing 32% of the world's tea exports volume in 2014 (Statista, 2015) and (Andae, 2015).

Tea industry is the largest employer in the agricultural sector and almost 10% of Kenya"s population depends directly or indirectly on the tea industry (Rutto & Ondiek, 2014). Stability in the tea industry has been maintained due to increases in production levels and therefore earnings from exports. However, overproduction, declining prices in the world markets and poor institutional management have negatively affected the Tea earnings (Were, Ndungu , Karangi , & Geda , 2002).

In Kenya, some commodity auction markets have specific approved hard currency as mode of exchange. Sale No. 42 of 26th October, 1992 is fondly remembered as the sale in which the Mombasa Tea Auction went international by conducting a most successful US dollar auction in accordance with Kenya Government Policy as per Exchange Control Circular No. 5/92/13 of 15/10/92 (EATTA, 2010).

1.1 Background

1.1.1 Kenyan Tea sector Case Study

In the 2013 export earnings from tea was KES 104.6 billion while in the 2014 tea exports value dropped to KES 93.9 billion owing to a dip in tea prices at the Mombasa Tea Auction.

Tea production is primarily divided into two sub-sectors: smallholder farmers and large Multinational Companies.

1.1.2 Smallholder farmers and KTDA

During the colonial period Kenyans of African descent were barred by law from growing tea. Only large scale farmers and multinationals were allowed to grow tea in order to maintain quality (Kenya Tea Development Agency Ltd, 2015). In 1960, the colonial government created the Special Crops Development Authority (SCDA) to promote growing of tea by Africans under the ministry of Agriculture.

After Independence, Kenya Tea Development Authority (KTDA) was formed through legal notice No.42 of 1964 and took over the liabilities and functions of the SCDA to promote and foster the growing of tea in smallholder farms, which were previously said to be unviable in view of the expertise and costs required, as witnessed in the plantation sector.

Kenya Tea Development Agency Limited was incorporated on 15th June 2000 as a private (Kagira , Kimani , & Kagwathi , 2012) company under (CAP 486) of the laws of Kenya, becoming one of the largest private tea management agencies (Kenya Tea Development Agency Ltd, 2015). The company manages 65 factories in 2015 (Kenya Tea Development Agency Ltd, 2015). Smallholders operate cooperative processing plants managed by KTDA at a fee of 2% of selling price of processed tea.

Smallholder farmers account for nearly 60% of Tea produced locally and most of this tea is sold as black loose tea in the Mombasa Tea Auction, the second largest tea auction in the world operated by the East African Tea Trade Association (EATTA). Tea is auctioned by factory name and grade. KTDA contributes 75% of the Tea auctioned. KTDA has 600,000 smallholder farmers who contribute its Tea.

KTDA functions include factory management services, sales and marketing, financial services and tea management and consultancy services (Kenya Tea Development Agency Ltd, 2015). Through its subsidiaries it also provides extension services, green leaf collection services, production of inputs, processing and marketing of tea on behalf of smallholder farmers (Kagira , Kimani , & Kagwathi , 2012). Activities by KTDA include Leaf Husbandry, Field Logistics, Processing,

Procurement, Quality Assurance, Warehousing, Blending, Packaging, Trading, Marketing, Customer-Service, Consultancy, and Insurance brokerage.

The Tea Agency is managed by a board of directors from twelve zones that represent the tea growing regions of the country. Each producer zone has a number tea processing factories. According to the KTDA business model smallholders are organised according to the tea factories where they are shareholders and deliver their tea periodically.

Each factory has six directors who are elected by the member farmers. Directors from each factory at the zonal level elect a board member to KTDA.

Each farmer receives an initial payment in advance, which is an agreed upon rate among all the KTDA factories. After selling at the Mombasa Auction each factory calculates a second payment depending on the selling price, loan payments, commissions and future investments. Additionally dividends are paid to farmers depending on the profit margin.

1.1.3 Large scale producers

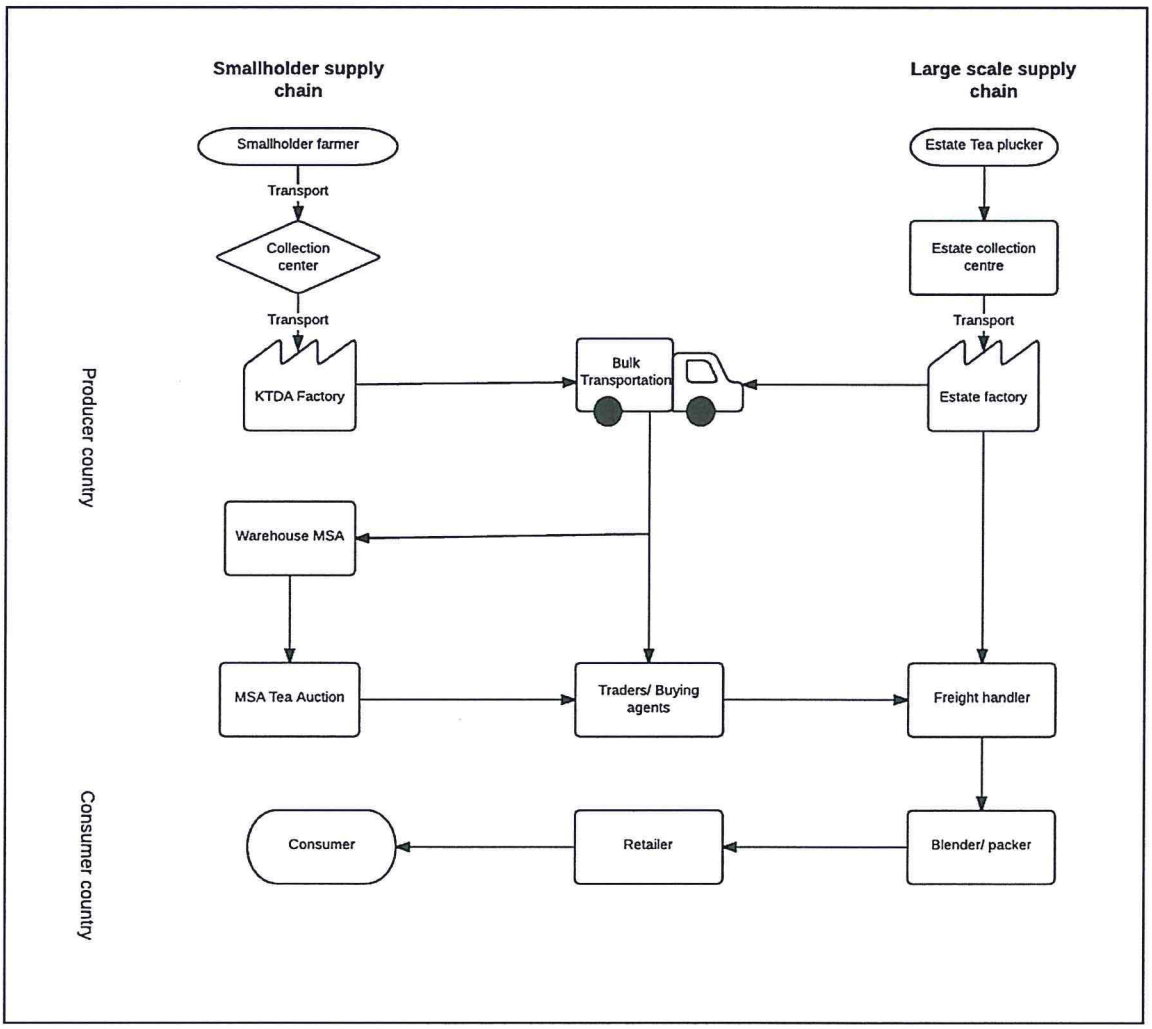
Large scale producers of Tea in Kenya are large tea estates that are privately owned such as the Sotik Highlands Tea estates and Eastern producers Kenya and multinational companies such as Unilever Kenya and James Finlay. Large scale farmers are organized under the Kenya Tea Growers Association (KTGA) that promotes common interest of members in growing and manufacturing of Tea. The association is made up of 39 tea factories and producers 40% of total tea production (Kenya Tea Growers Association, 2015) and (The Tea Board of Kenya, 2012).

Most of the tea produced by large scale producers is shipped directly to the blending and packaging centres.

The government of Kenya offers generous incentives for processing, blending and packaging tea such as VAT exemptions and a ten year corporate, income and withholding tax holiday (Chan , Amde, Mihretu, & Tamiru, 2010). Despite these incentives large multinational companies such as Unilever Kenya prefer to blend and package their produce in Dubai since it offers tax breaks, has better infrastructural facilities and is closer their target market which is Europe and America thus incurring low costs (KHRC, 2008).

Large scale growers are vertically integrated along the tea supply chain such that they directly grow, process, blend, package and market their tea. 80% of the tea price is attributed to value addition processes of blending, packaging and marketing which are controlled by a handful of multinational packers and brokers resulting in uneven value distribution along the supply chain resulting in smallholder farmers being price takers (Van der Wal, 2008). Large scale growers are also the main purchasers of tea at the Mombasa Tea auction with Unilever Ltd being the largest single share purchaser accounting for 15% - 20% of the tea sold at the auction (GAIN, 2013).

Chart 0-1 Kenyan Tea Industry Supply chain



1.2 Problem Statement

Tea production and processing is a focal sector in the Kenyan agricultural sector with its' being the largest foreign exchange earner in the sector and thus a key contributor to the country's GDP. The tea sector is also a key employer with 150,000 Kenyans employed and a key income source with over 600,000 farmers. Previous studies on the Kenyan Tea sector have focused on the impact of specific macroeconomic variables on the tea earnings.

(Rutto & Ondiek, 2014) Examine the impact of exchange rate volatility on the performance of Kenya's tea exports, (Kiptui, 2008) examined impact of real exchange rate volatility on Kenya's exports of horticulture and tea in an export demand framework while (Cherop & Changwony, 2014) focus on the effect of exchange rate fluctuation on the earnings of smallholder tea factories.

Given the critical importance of the tea sector in Kenya this study seeks to analyse the effect that macroeconomic variables namely, exchange rate and inflation has on the returns to tea farmers.

The exchange rate is an important variable in the tea industry due to the denomination of tea sales. In a stable foreign exchange rate regime, exporters of commodities reasonably expect to make profits. However during periods of fluctuating foreign exchange rates, exporters are negatively affected when the rate of depreciation is higher than that of appreciation.

Inflation on the other hand directly affects the cost of living, the cost of doing business, borrowing money, mortgages, corporate and government bond yields, and every other facet of the economy.

General Objective

This study seeks to analyse the impact inflation rate and exchange rate has on real returns to suppliers in the Kenyan Tea Industry.

1.2.1 Specific Objectives

1. To determine the existence of a functional relationship between the marketed tea returns and a set of independent factors namely exchange rate and inflation rate.

2. To determine whether there exists a long run relationship between marketed returns to farmers and inflation rate and exchange rate.

2 Literature Review

2.1 Introduction

This chapter reviews relevant literature on foreign exchange rate fluctuation. It cites review material relating to foreign exchange rate fluctuation and how it affects world trade both in international and in the local context. Secondly this chapter looks at the studies done on the impact of inflation rate volatility on commodity earnings.

2.2 Exchange rate

2.2.1 Concept of Currency and Currency Market

Currency is the legal tender of a given country. It is the acceptable means of exchanging goods and services. Many countries in the world have their own currencies. (Ezeala-Harrison, 1999) Defines hard currency as currency in which investors have confidence. Today, currency generally refers to printed or minted money. In order for any currency to be considered hard, the country needs to have a stable government, sound fiscal and monetary policies, and low inflation (Ezeala-Harrison, 1999).

Currency involves the exchange of goods and services for cash. The hard currencies are international currencies in the sense that they are acceptable internationally. They are used for transactions in many foreign countries, including transactions between locals. The currency market is the foreign currency market. This is where trading in currencies take place. Trading on the Foreign Exchange Market establishes rates of exchange for currency. Exchange rates are constantly fluctuating on the foreign exchange market. As demand rises or falls for particular currencies, their exchange rates adjust accordingly. Instantaneous rate quotes are available from a service provided by Reuters. A rate of exchange for currencies is the ratio at which one currency is exchanged for another (Cross, 1998).

2.2.2 Exchange Rate Regimes for Major Currencies

A country which produces hard currency has many advantages over those countries that do not. Possessing hard currency makes it much easier to do business worldwide. It can be equated to having a good credit score and shopping for a car.

One will be much more likely to not just to get the car, but get it cheaper with a good credit score. Countries like Japan, Britain and United States of America have taken full advantage of printing hard currency (Duarte & Obstfeld , 2005). Over the history of currency, countries' currencies have fluctuated between hard and soft. The challenges of the world's currency super powers are to maintain their economic hold and maintain their hard currency reputation (Duarte & Obstfeld , 2005).

2.2.3 Effects of Exchange Rate on Tea Pricing

Some studies have been done to establish factors affecting tea pricing at the Mombasa Auction. (Mukhweso, 2003) Noted that tea pricing at the Mombasa Tea Auction did not obey the market forces of demand and supply.

Tea pricing is dependent on quality, internal and external environment of the market. Tea Auction market is not efficient as entry by newcomers is restrictive both for buyers and brokers. Tea buyers do it on behalf of wholesalers who are resident abroad but only sent bids once they are advised on the garden prices as contained in the price catalogue (EATTA, 2007).

2.3 Inflation rate

Inflation means a sustained increase in the aggregate or general price level in an economy. Inflation means there is an increase in the cost of living. There is widespread agreement that high and volatile inflation can be damaging both to individual businesses and consumers and also to the economy as a whole. Aside from factors such as interest rates and inflation, the exchange rate is one of the most important determinants of a country's relative level of economic health.

Exchange rates play a vital role in a country's level of trade, which is critical to most every free market economy in the world. For this reason, exchange rates are among the most watched analyzed and governmentally manipulated economic measures. But exchange rates matter on a smaller scale as well: they impact the real return of an investor's portfolio (Gudmundsson, 2012)

Generally, the inflation rate is used to measure the price stability in the economy. A low inflation rate scenario will exhibit a rising currency rate, as the purchasing power of the currency will increase as compared to other currencies.

2.3.1 Exchange Rate and Inflation rate

Generally, the inflation rate is used to measure the price stability in the economy. Conceptually, the inflation can be divided into two sides, namely: demand side inflation (demand pull inflation) and supply side inflation (cost push inflation).For open-economy countries, inflation come from domestic factors (internal pressure) and also overseas factors (external pressure). The sources of external factors are the increase in the world commodity prices or exchange rate fluctuation. The influence of exchange rate towards inflation itself depends on the choice of exchange rate regime in the country. Exchange rate system has an important role in reducing or minimizing the risk of fluctuations in exchange rates, which will have an impact on the economy. Any changes in exchange rates will have a great impact on the economy (Fung, 2002).

3 Methodology

This study used a theoretical and empirical approach based on case study of the tea industry in Kenya. This study conducts a time series analysis of the relationship between the marketed tea returns with inflation rate and exchange rate macroeconomic variables.

3.1 Model specification

In analysing the relationship between the selected macroeconomic variables and tea returns, the traditional export frame work that was put forward by (Goldstein & Khan, 1978) was adopted and modified. The framework has been adopted by various studies for example, (Chowdhury, 1993), (Arize, 1995) and (Kiptui, 2008).

This export demand framework postulates a long-run relationship between exports, foreign economic activity, relative prices and exchange rate volatility.

The above frame is given as follows:

$$\ln X_t = \alpha + \beta_1 \ln Y_t + \beta_2 \ln P_t + \beta_3 V_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where;

X_t = Tea exports

Y_t= foreign income proxied by the industrial production index of industrial countries

P_t= export prices relative to world non fuel primary commodity prices

V_t= measure of risk or uncertainty given by the 12- months moving average of the standard deviation (σ) of absolute changes in the real effective exchange rate

ε_t = an error term

The following model is adopted by the study;

$$\ln Y_t = \alpha + \beta_1 \ln E_t + \beta_2 \ln I_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where:

Y_t = Marketed tea returns to suppliers

E_t = Exchange rate (USD/KES)

I_t = Inflation rate

In this study the Johansen multivariate approach introduced by Johansen (1988) is applied in order to establish the existence of a long – run or equilibrium relationship and the maximum eigenvalue statistic is used to test for the existence of cointegration.

Upon confirmation of existence of cointegration among the variables, an Error Correction Model (ECM) is estimated to capture the short-run dynamics. ECM corrects for disequilibrium or it is a means of reconciling the short run behaviour of an economic variable with its long run behaviour.

3.1.1 Cointegration analysis

Cointegration tests are conducted in case of non-stationarity of the series to ensure long run relationships. The long run equilibrium relationship among the variables was tested via (Johansen, Statistical Analysis of Cointegrating Vectors, 1988) and (Johansen & Juselius , 1990)approaches. The method is superior to the (Engle & Granger, 1987) two-step procedure in the estimation of both long-run relationships and Error Correction Models (ECM), as is applicable in a multivariate case that might be linked by more than one cointegrating vector. The Johansen and Juselius approach also determines the number of cointegrating vectors and provides estimates of these vectors together with estimates of the adjustment parameters.

The test for the number of significant characteristic roots of a matrix is found via the Trace Statistic Test. After determining the long run relationship between exchange rate volatility and the explanatory variables, the short run dynamics of the relationships are examined. The cointegration regression (Engle & Granger, 1987) is carried out where the residual obtained from the equation of the linear series is taken as the valid error-correction term which is then built into an error-correction model (ECM). Before carrying out the cointegration tests, we will first carry out the unit root tests of the time series properties of the concerned variables outlined in the model(2) above.

The modeling strategy is as follows;

a) Determine the order of integration of the variables by employing Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF) and Phillips-Perron (1988) unit-root tests;

b) If the variables are integrated of the same order, we will apply the (Johansen & Juselius , 1990) maximum likelihood method of cointegration to obtain the number of cointegrating vector(s); and

c) If the variables are cointegrated, we can specify an error correction model and estimate it using standard methods and diagnostic tests.

3.1.2 Data Collection Tools

This study employed secondary data from various sources. Marketed tea returns and the inflation rates data were obtained from the Kenya National Bureau of Statistics annual Economic surveys while the exchange rates data were obtained from Central Bank of Kenya (CBK).

Time series data was analysed using EViews 9 SV.

4 Data analysis and Findings

4.1 The Augmented Dickey-Fuller test for unit root

The study employed the augmented Dickey-Fuller (ADF) unit root procedure to confirm the time series properties and to test the level of integration for the variables concerned.

The variables in the series where found to have at least unit root between them (see table 1,2,3). The null hypothesis of the series being non-stationary is accepted in levels, however from the results from the table it is evident that there is exist a unit root for the data observed under the study.

Table 1 1

Null Hypothesis: LE has a unit root Exogenous: Constant, Linear Trend Lag Length: 0 (Automatic - based on SIC, maxlag=3)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.133609	0.8840
Test critical values:	1% level	-4.800080	
	5% level	-3.791172	
	10% level	-3.342253	

Table 1 2

Null Hypothesis: LY has a unitroot Exogenous: Constant, LinearTrend Lag Length: 2 (Automatic - based on SIC, maxlag=3)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller teststatistic		-2.416264	0.3547
critical values:	1% level	-4.992279	
	5% level	-3.875302	
	10% level	-3.388330	

Table 1 3

Null Hypothesis: LI has a unit root Exogenous: Constant, Linear Trend Lag Length: 3 (Automatic - based on SIC, maxlag=3)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.613791	0.0775
Test critical values:	1% level	-5.124875	
	5% level	-3.933364	
	10% level	-3.420030	

4.2 Cointegration Analysis

The researchers proceeded to conduct the multivariate cointegration test applying the Johansen and Juselius (1990) maximum likelihood estimation procedure.

The results from the cointegration analysis (Table 4) show that when one lag is used (one lag is sufficient for data using annual observation), the null hypothesis of no cointegration (r<= 2) between variables is rejected at 5 per cent or 10 per cent using either the trace test or maximum eigenvalue test. This provides evidence on the existence of at least one cointegrating vector in the model and therefore I conclude that the variables exhibit a long-run association between them.

Table 1 4

Date: 06/01/16 Time: 18:03
Sample (adjusted): 2003 2015
Included observations: 13 after adjustments Trend assumption:
Linear deterministic trend Series: LE LI LY
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.827579	35.48578	29.79707	0.0099
At most 1	0.506953	12.63418	15.49471	0.1289
At most 2	0.232571	3.441224	3.841466	0.0636

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.827579	22.85159	21.13162	0.0284
At most 1	0.506953	9.192956	14.26460	0.2705
At most 2	0.232571	3.441224	3.841466	0.0636

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

4.3 Error correction model

After establishing that there exists a long run association between the variables we run an Error Correction Model (ECM) to establish whether there exists short term dynamics between the variables.

The goodness-of-fit variable (R squared) show that the exogenous variables account for 53.75% of the variations in exports in the short run. The DW statistic is 0.4682 and smaller than R2, implying that the regression is spurious (Non sense in nature).

Table 1 5

Dependent Variable: LY Method: Least Squares
Date: 06/02/16 Time: 09:57
Sample: 2001 2015
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.18454	3.904779	2.864322	0.0142
LE	3.196480	0.883940	3.616172	0.0035
LI	0.137207	0.164496	0.834105	0.4205

R-squared	0.537563	Mean dependent var	24.81106
Adjusted R-squared	0.460491	S.D. dependent var	0.449075
S.E. of regression	0.329851	Akaike info criterion	0.796507
Sum squared resid	1.305622	Schwarz criterion	0.938117
Log likelihood	-2.973801	Hannan-Quinn criter.	0.794998
F-statistic	6.974750	Durbin-Watson stat	0.468201
Prob(F-statistic)	0.009779		

The residual term is therefore analysed using Augmented Dickey Fuller Test to confirm the spurious nature of the regression. If residual is stationary then the model is no longer characterised as spurious.

Table 1 6

Null Hypothesis: LU has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.614849	0.4494
Test critical values:	1% level	-4.004425	
	5% level	-3.098896	
	10% level	-2.690439	

As shown in table 6, the null hypothesis that the residual (LU) has a unit root and is therefore non stationary is accepted since its test statistic in absolute terms (1.6148) is less than the critical value at a 5% (3.0988).

This confirms that the regression is spurious and therefore there are no short term dynamics between the variables.

4.4 Findings

The study was aimed at finding out whether there exists a functional relationship between marketed tea returns and macroeconomic variables namely inflation rate and exchange rate. Secondly the study aimed to analyse the nature of the relationship between the variables.

The study found that a true relationship exists between the variables as noted by the cointegration analysis. A long-run relationship exists between marketed tea returns, inflation rate and exchange rate. In that the variables are cointegrated and have a long run relationship.

However, the model is unacceptable in the short run. This implies that despite the variables moving together in the long run they are independent in the short run. The above was established after an error Correction model determined that it is spurious in the short term.

4.5 Conclusions

The Tea exports trends observed indicate that Kenya's share of global tea trade has been fluctuating over time, leading to volatility in earnings of tea to farmers. Given the long run relationship observed between marketed tea returns, Exchange rate and Inflation rate, policy intervention on the exchange rate and inflation rate regime would invariably protect tea farmers from the negative effects of fluctuation of tea earnings.

Monitoring of exchange rate volatility and adopting appropriate monetary and fiscal policies to ensure stability in exchange rate will cushioning the negative effects of exchange rate fluctuations in performance of tea returns in the country as well as the effects of inflation and protect incomes of suppliers households.

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