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The Effects of Exchange Rates on Kenyan Sugar Imports from COMESA Region

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Abstract: Kenya's currency has devaluated against the US dollar and also to its major trading partners for the past years which has resulted to increased costs of importing major processed agricultural commodities and import duties. The objective of this paper is to find the impact Kenyan exchange rates on sugar imports from and to evaluate the nature of relationship between Kenyan exchange rates and sugar imports from COMESA. This paper used secondary data of thirty five years from the year 1976 to 2010. The Data was obtained from Kenya book of sugar statistics. Exchange rates are dependent variables and amounts of sugar imports as the independent variable. Testing units was done using Augmented Dickey Fuller (ADF) and Phillips-Perron (PP). Johansen test for co-integration was used to test for co-integrating relationship between the variables. Vector Autoregressive model and Vector Error correction models were used in this study with the application of econometric analysis on the models. The results from this study show the co-integrated relationship between the effects of importing sugar from COMESA on Kenya's foreign exchange rate.

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I. Introduction

Stability of a country's exchange rate determines the cost of imports and import duties on major imported commodities (Ceglowski, 2010). Kenya's currency has devaluated against the US dollar and also against its major trading partners. The currency devaluation has led to increased cost of importing major processed agricultural commodities, as well as import duties.

Kenya is an importer of sugar from both within and outside COMESA. Sugar production is way below the demand, with production at approximately 550,000 metric tonnes per year, while demand lies at approximately 800, 000 metric tonnes (KSB, 2013). This implies that the country must import to meet a deficit of approximately 250, 000 metric tonnes. However, the country has faced challenges related to devaluated currency against its major import sources.

Therefore this paper sought to investigate the effect of exchange rates on Kenyan Sugar Imports from COMESA. Specifically, to evaluate the impact of foreign Exchange rates on sugar imports from COMESA and to evaluate the nature of the relationship between Kenyan exchange rates and sugar imports from COMESA.

II. Theoretical Literature

The monetary theory of the balance of payments, which relates movements in international reserves (if exchange rates are fixed) or the exchange rate (if it is floating) to shifts in the relative demand for and supply of money, yields a similar functional relationship. Conventional currency theory holds that a currency with a higher inflation rate (and consequently a higher interest rate) will depreciate against a currency with lower inflation and a lower interest rate.

According to the theory of uncovered interest of parity, the difference in interest rates between two countries equals the expected change in their exchange rate. So if the interest rate differential between two nations is 2%, the currency of the higher-interest-rate nation would be expected to depreciate 2% against the currency of the lower-interest-rate nation.

In both theory and practice, there is a close relationship between movements in the exchange rate and the rate of inflation. The Purchasing Power Parity theory of exchange rate determination, which is based on the law of one price, expresses the change in the exchange rate as a function of the difference between the change in world prices and the change in domestic prices.

A stronger domestic currency can hurt exports and on the trade balance. Higher inflation can also affect exports by having a direct impact on the input of exports in the international trade environment costs such as materials and labor. These higher costs can have a substantial impact on the competitiveness. (BRADA, 1998). The study examines the exchange rate and stabilization of trade policy in alternative economies. Analysis finds out that exchange rate procedure has a protectionist force in alternative economies. The pressures emanating

from exchange rate policy depends on the changes of nation level. The analysis also has been finding out that protectionist pressure can be cyclical in transition economies.

A research was done by (Council for Economic Education, 2014)found that, if the other nation’s products sell at a lower price than domestic products, consumers will increase their demand for imports. And when domestic incomes rise or domestic inflation rates are higher than those in other nations, demand for imports will rise, as well. In capital markets, if another nation’s interest rate (return on investment) is higher than the domestic interest rate, some people will choose to invest in the other nation’s securities. When consumers import more products from a country or invest in that country’s securities, their demand for that currency increases. This increase in demand pushes the price of the currency higher, so their currency appreciates (rises in value). This research was, therefore, seeking to find the effect of importing sugar from COMESA to Kenyan shilling

III. Methodology

Unit Root Test

Dickey Fuller Testby (Dickey & Fuller, 1979) and Phillips-Perron (PP) by (Perron, 1989) test for Unit Root was tested, such that a time series y_t is assumed to be a trend. Therefore, it tests the null hypothesis that a time series is stationary.

The significance of all coefficients of the longest lag was tested. If they were jointly insignificant, the lag is dropped and the VAR re-estimated co-integrating vectors (Carlsson, Lyhagen, & Österholm, 2007)

Johansen Test for Co-integration was used to test for co-integration so as to establish relationship among the time series variables (Johansen, 1992).

IV. Results And Discussions

Descriptive Statistics

Table 1 Summary Statistics

Variable	Obs	Mean	Std. Dev	Min	Max
M (Imports)	38	75346.87	99396.81	218	553786
e (Exchange rates)	38	46.29389	29.91663	7.420187	88.81077

Source: Data analysis (2017)

Plot of Variables.

There is a trend from 1976 to 2000. From 2000 to 2013, there was a trend and growth. This is as a result of increased demand and consumption in the country.

From 1972 to 2013 there has been both trend and growth across the years. This has been due to a continuous decrease in the value of Kenyan shilling in the international market

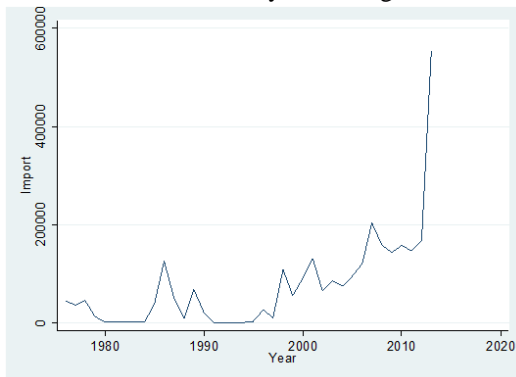


Figure 1 Plot of Imports

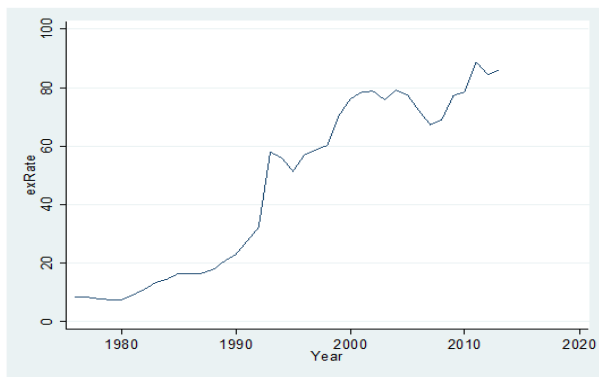


Figure2 Plot of exchange rates

Source: Data analysis (2017)

Phillips-Perron test statistic

We tested the null hypothesis that Import series has a unit root, or is non stationary. We failed to reject the null hypothesis of a unit root in time series at 5 percent significance level; The P value of 0.9964 is greater than 0.01, 0.05 and 0.1 levels of significance. The series shows non stationarity

Null Hypothesis: IMPORT has a unit root

Exogenous: Constant
Bandwidth: 1 (Newey-West using Bartlett kernel)

		Adj. t- stat	Prop*
Phillips- perron test statistics		1.006765	0.9964
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

Augmented Dickey-Fuller test statistic

We tested the null hypothesis that Import series has a unit root, or is non stationery. Table 4.4 below shows that the critical values at 1%, 5% and 10% are all below the critical value of 0.659810. we fail to reject the null, The P value of 0.9895 is greater than 0.01, 0.05 and 0.1. the series shows stationarity

Null Hypothesis: IMPORT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.659810	0.9895
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

Source: Data Analysis (2017)

Optimum lag

Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-523.472				1.8e+12	33.9014	33.9316	33.9939
1	-465.334	116.28*	4	0.000	5.5e+10*	30.4086*	30.4991*	30.6862*
2	-464.41	1.8466	4	0.764	6.8e+10	30.6071	30.7579	31.0697
3	-462.955	2.91	4	0.573	8.0e+10	30.7713	30.9824	31.4189
4	-460.916	4.0777	4	0.396	9.3e+10	30.8978	31.1692	31.7305

Source: Data analysis (2017)

All the criteria that is; Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC), Hannan Quinn Information Criterion (HQIC) and Final Prediction Error (FPE) are appropriate and have a likelihood lag of 1 (optimum lag of 1 was selected)

Co-integration Test

Co-integration test was used to determine if there is any long term relationship between the two series. The hypothesis tested was that there was at most one co-integrating equation.

maximum rank	Parms	LL	eigenvalue	trace statistic	5% Critical value
0	2	513.082		9.9788*	15.41
1	5	-508.25219	0.24731	0.3192	3.76
2	6	-508.09258	0.00934		

Source: Data analysis (2017)

There is at least one co-integrating relationship between exchange rates and amount of sugar import to Kenya. Johansen tests for co-integration gives a value of 9.9788* meaning exchange has a greater effect on the sugar import. There is a long term relationship between the variables.

The result was used to test the hypothesis, there is co-integration as shown on statistic therefore 9.9788* we fail to accept the null hypothesis (H₀)

Vector error-correction model

Equation	Parms	RMSE	R-sq.	chi2	P>chi2	
D_ Imports	4	37182.7	0.2820	11.39025	0.0025	
D_exrate	4	5.64028	0.1464	4.973998	0.0374	
	Coef.	Std. Err	Z	P> z	[95% Interval]	Conf.
D_import	-4096933	.1556932	-2.63	0.009	-.7148464	-
_ce1 L1.					.1045403	
import	-.1585422	.1717437	-0.92	0.356	-.4951537	
LD.					.1780693	
exrate	-1233.203	1295.758	-0.95	0.341	-3772.842	
LD.					1306.436	
_cons	6.69e-06	7259.135	0.00	1.000	-14227.64	
					14227.64	

D_exrate	1.42e-06	.0000236	0.06	. 0.952	-.0000449
_ce1					.0000477
L1.					
import	2.57e-06	.0000261	0.10	0.922	-.0000485
LD.					.0000536
exrate	.0998074	. 196555	0.51	0.612	-.2854334
LD.					.4850482
_cons	1.936186	1.101147	1.76	0.079	-.2220217
					4.094394

Source, research output (2017)

The amount of sugar imports has R- square of 0.2820 and the exchange rate has R- square of 0.1464 explain how amount of sugar imports best fit the rate of foreign exchange rate and how best foreign exchange rate fit the amount of sugar import.

The $p > \chi^2$ for sugar imports is 0.0025 and for foreign exchange rate is 0.374 which are less than 0.05 when tested at 5% level of significance implying the model adopted significant therefore regression results will not be false. The overall significance of the model (explanatory power) is shown therefore the results are trusted. $p > \chi^2$ for both the sugar imports and the rate of exchange is close to 0.0000 indicating that there is significance.

Test of Hypothesis one

The study hypothesized that there was no significant relationship between foreign exchange rate and sugar imports from COMESA, however, from the Johansen co-integration test results was found that there was one co-integrating relationship or equation, therefore we reject the null hypothesis.

V. Conclusion

Changes in foreign exchange rates have a significant effect on the amount sugar imported in Kenya. The variations in exchange rate play an important role in the determination of trade balance. Exchange rate instability directly affects the prices of imports, exports, their fluctuating rates, balance of payment and balance of trade. So exchange rate plays an important role in an economy. If currency is appreciated

The national government should ensure there is stability in the supply of sugar to its citizens by removing the trade barriers that it sets on the importers, so as to encourage importation of sugar to meet the growing demand of sugar which the local producers can't meet

The national Government should also put in place measures that ensure the local sugar Kenya should implement trade liberalization policies set by COMESA so as to enable better trading environment for sugar with COMESA countries.

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