Factors That Contribute The Changes Of The Exchange Rate In The Flexible Of The Exchange Rate In Somalia

Conference Paper · May 2019

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ABSTRACT

The exchange rate is very important, because it allows for the conversion of national currency into another, thus it can facilitate international trade for goods and services and the transfer of funds between countries and it also allows comparison of prices of goods at the same in different countries. In general, the price difference between similar goods determines the goods traded and where they were sent. However, the currency could stir volatility it depends on the economic situation in the foreign exchange market in particular.

The purpose of this study is to investigate the effects of the selected macro-economic variables on exchange rates in Somalia. This paper was used Ordinary Least Squares (OLS) to make econometrics test. And consider using Arbitrage Pricing Theory.

This paper found that trade Balance has a significant negative relationship to exchange rate in Somalia while inflation and GDP per capita have a positive relationship to exchange rate. Exchange rates also may be affected by some other factors that have not been considered in this study, so that this study recommends that central bank of Somalia should enact policies that improve the political factor it contributes towards gaining value of the Somalia shilling.

Keywords: *Exchange rate, GDP per capita, inflation, trade balance and OLS method*

1. INTRODUCTION

The exchange rate is defined as the number of units of domestic currency, the need to buy one unit of foreign currency. In other words, the exchange rate at which one currency in one country can be exchanged for other currencies. The exchange rate is very important, because it allows for the conversion of national currency into another, thus it can facilitate international trade for goods and services and the transfer of funds between countries and it also allows comparison of prices of goods at the same in different countries. In general, the price difference between similar goods determines the goods traded and where they were sent. However, the currency could stir volatility it depends on the economic situation in the foreign exchange market in particular.

In African countries, exchange rate hurts the economic growth, in export since a significant portion of the costs of production is paid in domestic currency so that exchange rate results in a reduction of domestic currency and capacity of exporters to struggle in foreign markets. This chokes foreign exchange receipts and damages a country's capacity to buy the imports needed for economic activity (Howard J. Shatz, David G. Tarr,, 2000).

Figure 1.1: annual Exchange rate and Inflation in Somalia, (1970-2014)
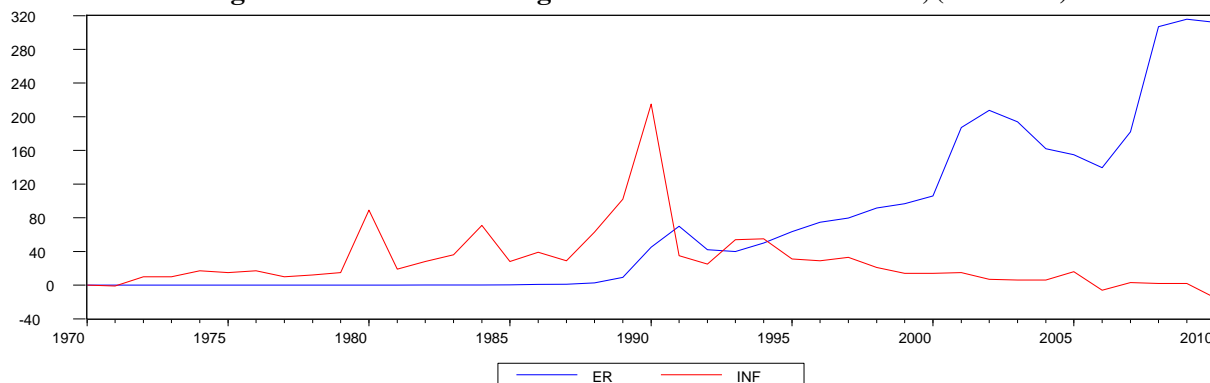
(Source: TheGlobalEconomy.com, the World Bank (2015))

Figure 1.1 explain Somali exchange and inflation has fluctuations in 1970 up to 1990 the exchange in Somalia was stable after 1991 starts to increase rapidly, but the inflation increased 1990 but after that was began to decline.

The relationship between the real effective exchange rate and macroeconomic factors is fast becoming an important area of study in both the developing and developed countries.

In the 1980s, before the collapse of the Somali state, Somalia has had a very distressing monetary experience marked by financial chaos, currency collapse, runaway inflation and bankfailure. By 1989, the whole banking system either collapsed or was on the verge of collapsingowing to too much government involvement, mismanagement and corruption. The Central bank lost control of money supply and became mainly a tool for financing the government's huge budget deficit; the Commercial and Savings Bank was declared bankrupt; and the Somali Development Bank was incapacitated because of lack of resources (Dalmar, 2015).

High levels of economic growth can be recognized problems that have challenged Somalia, increases in inflation can erode the real value of money and other items with in underlying monetary nature. Also the effect unbalance trade increases the instability in currency exchange rate. The questions that basically come to mind concern the performance of economy to economic growth, inflation and balance of trade, does the exchange rate matter in Somalia when it comes to improving these factors? Are these factors have a relationship with exchange rate? This study aims to provide answers to these questions by examining the impact of exchange rate on macroeconomic factors in Somalia.

this study will benefit central bank of Somalia and economic policy makers to get more information about what determine exchange rate in Somalia. The study will help to get tools that can be controlled the determinant of exchange rate that will help foreign exchange rate Which will benefit not only the citizens of Somalia when they perform international trade, but foreign investors as well.

2. LITERATURE REVIEW

2.1 Relationships between marco economic variables and exchange rate

Fetai et al (2016) examine relationship between exchange rate and inflation, this paper investigates empirically the relationships between exchange rates and inflation in Western Balkan countries. They apply panel methods data such as Fixed and Random Effects Model and 'Hausman-Taylor instrumental variables IV' model to evaluate the effect of exchange rate changes on inflation in Western Balkan countries from 1996-2014. They found that changes in the exchange rate will have a strong influence on inflation in Western Balkan countries. The result also exposes that the exchange rate is still the main source of inflationary pressures in Western Balkans countries. Therefore, policy makers must consider the relative costs and benefits associated with introducing a stretchy exchange rate in small open economies because such regime is likely to incur more costs than benefits.

Albuquerque and Portugal (2004) study relationship between exchange rate and inflation, this paper look for to set up the relative between exchange rate and inflation instabilities by implementing extra sophisticated econometric methodology than those applied so far a bivariate GARCH model, commerce directly with the effects of provisional volatilities. The study was found that a semi-concave relation between exchange rate and inflation variances, in a different way from what was expectable for financial series and in line with the intuition obtained from other studies. They innovate by applying a multivariate GARCH model, then allowing for conditional variances to evaluate the relation between volatilities, trying to launch a relation between exchange rate and inflation instabilities and its suggestion for the monetary policy and viewing that traditional tests perform with exogenously constructed volatility series are receptive to the criteria chosen to construct such series and do not expose relevant features of that relation. Ebiringa et al. (2014) investigate a long run relationship between exchange rate and inflation using autoregressive distributed lag (ARDL) co-integration analysis. And they using historical data on Nigeria (1971-2010), they recognized a significant short-run and also long run positive relationship between exchange rate and inflation. They recommended that Nigeria would be better off, if her monetary system consider a policy power that targets both exchange rates and inflation, also as maintain a stable interest rate regime. The advantage of this is not independent with the penchant to put both the domestic and international sectors into contemplation while crafting the monetary policy of the country.

Bhattarai and Arham, (2005) This paper examines the effects of exchange rates on the trade balance of Ghana. The paper first develops the real exchange rate as a function of favorites and technology of two trading economies and then applies small price taking economy hypothesis to the Ghanaian economy, using annual time series data from 1970-2000 to evaluation trade balance as a function of the real exchange rate, domestic and foreign incomes. Cointegration analyses of both single equation models and VAR-Error correction models approve a stable long-run correlation between both exports and imports and the real exchange rate. The short-run elasticities of imports and exports show contractionary effects of deflation in terms of the Marshall-Lerner-Robinson conditions though these elasticities add up to almost 1 in the long-run estimates. The general conclusion tired from the study is that for improved balance of trade in Ghana, coordination between the exchange rate and demand management policies should be supported and be based on the long-run basics of the economy. The results also show that in the short-to-medium term, as well as in the long term, income levels are not important determinants either of the import demand or the export demand of Ghana. Imports are inflexible and the exports, being predominantly primary commodities, are a lower commodity in the global market. The results show that it is the exchange rate that is the significant factor in the short term. In the long run though, the study exposes that only the real exchange rate expressively affects the trade balance. In short, the econometric model indications that the policies that have been adopted by Ghana have not been effective when estimated in terms of the MLR conditions for a successful devaluation. Furthermore, the model and associated results indicate that more effective policies may be founded on a sharper appreciation of the interaction and the interrelationships between the policy tools which have been considered here. It would be interesting to see how far these low elasticities relate to the preferences of households, the technology of firms, and policy instruments under consideration by the government, taking account of structural realities of the Ghanaian economy, in order to establish an incentive structure in Ghana that is conducive to macroeconomic stability and higher rate of growth. These matters will be taken up in successive work.

Kharroubi (2011) examines the relationship between the trade balance and the real exchange rate in two behaviors. On the one side, the growth of trade charming place within industries makes the trade balance more complex to real exchange rate movements. On the other side, a higher degree of upright specialization and more global supply chains act to reduction this sensitivity. The relation importance of these two effects differs across countries. According to the estimate presented in this study, fluctuations in the real exchange rate could play a bigger role in decrease the US trade deficit than in declining the Chinese trade surplus. The study was concluded for to approve real exchange rate modification is only part of the explanation for global rebalancing, and needs to be attended by other policy actions. Sabri (2006), tests the relationship between per capita income differential and exchange rate differential between two different economic background countries. The study was had chosen United States of America as fully developed country and Pakistan as developing country. The study was conducted during the past ten years' per capita income and exchange rate data in rupees. The findings of this research suggest a positive relationship between per capita

income differential and exchange rate differential but there is a small impact of per capita income differential on exchange rate between these two countries as there is a enormous differences between the USA per capita income and Pakistan per capita income, Pakistan always has a massive per capita income because of that aim Pakistan currency incessantly depreciating.

Korkmaz, (2013) This study was examining the effect of exchange rate on economic growth exchange rate systems were mentioned; by using annual data of the 2002-2011 period from nine casually selected European countries, if there is a relationship between the exchange rate and economic growth has been confirmed by doing panel data analysis. The foreign exchange, on the other hand, is affected not only by economic factors but also by political decisions. The decision of the Central Bank of a country taken in relative to foreign exchange can affect the foreign exchange market of another country. The anticipation that FED will start to extract the monetary support it has provided has deeply affected the foreign exchange market, too. Obviously, especially developing countries grieved more due to this. After the rise in dollars in global markets, inflation figures more than expected were encountered. The rise in the value of dollars affects Turkey in two features. The first one is that our foreign exchange liabilities are in excess of our receivables in foreign exchange, and secondly our saving percentage is very short. In order to seize a good level of growth, the percentage of investments within the national revenue should growth. The anticipation of rise in the interest rates along with the foreign exchange rate influences growth and unemployment variables. If these rises become continuous, there will be a decline in growth and an increase in unemployment rates. High interest rates especially requests to foreign investors. In direction to make use of interest gain, hot money reaches in Turkey. Upon the entering of hot money into the market, Turkish Liras become valuable. This harmfully affects external trade. Turkish goods become more expensive and there is a decline in export. In this case, it is estimated that the interest rates of the Central Bank of Turkey will decline and foreign exchange will be credited from the market in order to rise the foreign exchange reserves. In this study, the relationship between the foreign exchange rate and economic growth variables were verified with reverence to the 9 randomly selected European countries. It was resolute that there was a long term balance relationship between the foreign exchange rate and economic growth for the 9 European countries. Granger causality test was used and it was concluded that there was a causality from the foreign exchange rate to economic growth.

2.2 Theoretical Framework

The Arbitrage Pricing Theory was developed by Stephen Ross in 1973. The APT was developed as an alternative to the CAPM developed by William Sharpe (Ross S. A., 1976). Although the APT also acknowledges that firm specific risk can be diversified away, it recognizes that there are multi factors that serve as risks aside the market risk. Hence, APT solves the limitation of CAPM as a single factor model.

One important aspect of the APT is the principle of arbitrage. It argues that in an efficient market, any two assets with similar risks and return should sell for the same price across markets and hence when there is a disparity in prices of equivalent assets, there is room for riskless profit, thus arbitrage. Investors will consequently buy the asset at a cheaper price and sell for a higher price in another market. This continuous arbitrage operation by investors will eventually lead to an equilibrium of the prices of assets across markets. The Arbitrage Pricing Theory is expressed as:

Ra = a + β1 (rfactor1) + β2 (rfactor2) + β3 (rfactor3) + ⋯ + noise ………… (1)

Where Ra is Return on asset, a is Risk free rate, β is beta of specific risk factor, r is Premium on specific risk factor and Noise is Firm specific risk (will be eliminated by diversification).With APT being an extended multi factor form of the CAPM, it presents more advantages over the traditional CAPM in terms of the number of factors to consider and the less rigorous assumptions (Adu, 2012). Considering the fact that most African are very fragile and more likely to be influenced by macroeconomic factors, the APT provides an ideal framework for measuring the impact of macroeconomic factors on the stock prices in African countries (Adu, 2012).

One major shortcoming of the APT is that it does not specify the type and the number of macroeconomic factors to consider in measuring returns to an asset. This, however, might be viewed as a strength since it room for the researcher

to choose the macroeconomic factors that are peculiar to the country of study in order to present a more relevant results.Even though APT and CAPM do not offer satisfactory explanations to risks and returns on assets, the APT is by far a better explanatory model of stock returns than the CAPM since it allows room for multi factors in the analysis.

Based on similar empirical studies into the relationship between macroeconomic variables and stock price movement, the Ordinary Least Square Regression (OLS) was used for this study. Just like most researchers of this topic, applied the OLS in their data analysis because the tool provides an ideal framework for examining the relationship between a continuous response variable (Y) and a continuous explanatory variable(X). The tool uses an equation of the line of best fit which links the X variables to the Y variables. The OLS regression with multiple explanatory variables can be equated to the APT equation, thus:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

The econometrical analysis of this thesis has its foundation in the theory of simple and multiple regressions. A simple regression describes the effect of one x variable, also known as an independent variable, on the dependent variable y. The dependent variable is throughout this paper represented by daily stock returns of one of the four Swedish banks, analyzed in this paper. A simple regression equation is

$$y = \beta_0 + \beta_1 x_1 + u \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

In the equation is a constant and is a slope parameter between y and x. The main interest of the analysis is to capture the effect a change in the x variable has on the dependent variable y holding the factors in fixed. The variable in the equation represents an error term and includes all factors that affect y except. One application of a simple regression model in this thesis could for example be to test how changes in CDS-spreads affect stock returns. CDS-spreads are then used as the only explanatory variable represented by the -variable in equation. Of course changes in CDS-spreads are not the only factor that affects changes in stock returns for the bank stocks. To make the analysis more accurate it is straightforward to include more explanatory variables. The equation is then developed into a multiple regression. The equation is defined as

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 \dots\dots + \beta_k x_k + u \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

The interpretation of the beta values are the same as it is for the simple regression model with the only difference that when the effect of a change in one variable is estimated ceteris paribus is assumed, that means, holding all other variables constant. The multiple regression model is used in this thesis to capture and analyze effects of more macroeconomic factors that may affect stock returns for the "Big four". Factors previously included in the error term are instead included as explanatory variables in the original model. It would be impossible to include every variable affecting stock returns in one single model and some factors are therefore still included in the error term u. Because the objective of this analysis is to focus on macroeconomic factors it is not unrealistic to assume that corporate specific factors are included in the error term. Examples of such factors are a range of financial ratios, insider trading, and corporate structure etcetera. Other reasons why results may differ between banks are differences in such corporate structures and the individual risk factors that banks are exposed to.

3. DATA AND METHODOLOGY

Econometric Technique using a time series data covering the period from 1970 to 2014 in Somalia has been used which were obtained from SESRIC and World Bank. Data include the annual series data on variables of exchange rate, inflation, GDP per capita, and trade balance.

3.1 Data and Measurement

Exchange rate	Obtained from WORLD BANK and SESRIC it is the value of Somali shilling measured against US Dollar from 1970 up to 2014.
GDP per capita	GDP Per capita in Somalia from 1970 until 2014 in SESRIC
Inflation	Inflation represents GDP deflator date obtained from trading economics from 1970 up to 2014.
Trade balance	Difference between Export and Import in Goods and service exported Somalia country by using date from 1970 up to 2014 the data obtaining from SESRIC and WORLD BANK.

3.2 Model Specification

The statistical technique in used in this study is Ordinary Least Squares (OLS) to make econometrics test and hypothesis to specify the model used by this cited a variety of the models has been precise to make possible for the test of hypothesis that whether explanatory variables determine exchange rate.

$$E = \beta_0 + \beta_1 INF + \beta_2 BOT + \beta_3 GDPP + \varepsilon_t$$

Where:

E: Exchange rate

INF: Inflation

BOT: Balance of trade

GDPP: GDP Per Capita

ε_t: Error term

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

In the following table Descriptive analysis shows the Maximum, Minimum and Mean average, mean, value stands highest average and Standard deviation.

With the dependent variable, the descriptive results in Table 4.1 show that average of exchange rate is (6.459163) unit, and its standard deviation is (3.524695) and the highest is (10.36045) unit. With the independent variables include trade balance, GDP per capita and inflation. The average of trade balance is (34.93038) unit and its standard deviation is (1.584657) and its highest is (38.17907) unit. The mean average of GDP per capita is (5.032338), the standard deviation of GDP per capita is (0.362679), and its highest is (5.651436). The mean average of inflation is (3.659883), the standard deviation of inflation is (1.171942), and its highest is (5.372807),

Trade balance has the highest average number were (34.93038) while inflation has the lowest average number was (3.659883) Highest Stander derivation variable is exchange rate (3.524695). And GDP per capita has the lowest Stander derivation (0.362679).

Table: 4.1: Descriptive statistics

	LER	LBOT	LGDPP	LINF
Mean	6.459163	34.93038	5.032338	3.659883
Median	8.411833	34.30256	5.017876	3.539219
Maximum	10.36045	38.17907	5.651436	5.372807
Minimum	1.837609	33.00263	4.499143	-0.372631
Std. Dev.	3.524695	1.584657	0.362679	1.171942
Skewness	-0.315288	0.426138	0.281782	-1.049633
Kurtosis	1.293110	1.699023	1.928838	5.035724
Jarque-Bera	6.208307	4.535464	2.746860	16.03329
Probability	0.044862	0.103547	0.253237	0.000330
Sum	290.6623	1571.867	226.4552	164.6947
Sum Sq. Dev.	546.6329	110.4900	5.787594	60.43174
Observations	45	45	45	45

4.2: Correlation

Table 4.2: Correlation Matrix

	LER	LBOT	LINF	LGDPP
LER	1			
LBOT	-0.7058	1		
LINF	0.6729	-0.15129	1	
LGDPP	0.54264	-0.1608	0.35505	1

4.3 Unit root Test

To test the stationary of the data, the paper tests ADF (Augmented Dickey Fuller) were conducted. The presences of non- stationary variables might produce false regression results.

The results shows that the null hypothesis of non-stationary at level for all the time series fails to be accepted. However, all null hypothesis were rejected for every test at first difference. It indicates cleary that all varialbes are stationary at (first difference).

Table 4.3: Stationary Test at level & at 1st difference

Variables	ADF		PP	
	At level	1st difference	At level	1st difference
Exchange rate	0.9340	0.0087	0.9043	0.0451
GDP per capita	0.1163	0.0005	0.2983	0.0001

Inflation	0.0018	0.0000	0.0017	0.0000
Trade balance	0.0899	0.0012	0.1666	0.0012

4.4 Regression Results

After testing the unit root test and having established the presence of a unit root in the first difference of each variable, the next step is to test whether there is OLS among dependent variable and independent variable.

The result of the model shows that the coefficients of LBOT (-1.307810) is negative indicating that in this stage the study will accept the hypothesis which predicted that these variables have negative relationship with Exchange rate, it means that one increase (decrease) in this variable will result in one percent increase (decrease) in the exchange rate while holding other variables constant. The model also shows that LINF (1.462179) and LGDPP (2.677255) have positive relationship with Exchange rate.

Table 4.4: Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBOT	-1.307810	0.116456	-11.23008	0.0000
LINF	1.462179	0.166250	8.795081	0.0000
LGDPP	2.677255	0.538028	4.976048	0.0000
C	33.31719	5.120724	6.506345	0.0000

4.5 Diagnostic Tests

It is obvious from residual diagnosis that neither Hetroskedacity nor Serial correlation exist which means the model of choosing is good and fit. The R squared (R^2) value for this model is 89% implies that our independent variables explain about 89% systematic variation on the model over the observed year while the remaining variation is explained by other determinants variables outside the model counted in residual term e. the validity of the model is tested with comparing R^2 with Durbin-Watson test, if DW is greater than R^2 the model is valid otherwise not. Since DW= 1.273731 is greater than R^2= 89% and also F-statistic are significant, so that this model has validity **Table 4.5: Variance Inflation Factor**

	Centered
Variable	VIF
LBOT	1.037359
LINF	1.156296
LGDPP	1.159821
C	NA

Table 4.6: Heteroskedasticity Test

Heteroscedasticity Test: ARCH	

F-statistic	0.619693	Prob. F(3,38)	0.6066
Obs* R-squared	1.958935	Prob. Chi-Square (3)	0.5810

Table 4.7: Serial Correlation Test

Breusch- Godfrey Serial Correlation LM Test:			
F-statistic	2.101089	Prob. F(3,38)	0.1162
Obs* R-squared	6.402396	Prob. Chi-Square (3)	0.0936

From the above, there is no serial correlation in the model due the probability of the observed Prob. Chi-Square (0.0936) is greater than 0.05 on the other hand, there is no Heteroskedasticity in the model owning to the fact that the probability of the observed R-square (0.5810) is greater than 0.05 and all independent variable are in significant.

5. CONCLUSION AND POLICY IMPLICATION

This paper has investigated the affect of the selected macro-economic variables on exchange rates in Somalia for the period which spanned between 1970 and 2014. An Arbitrage Pricing Theory was estimated via the Ordinary Least Squeare (OLS) techniques to establish the relationship between selected macroeconomic variable and exchange rate in Somalia. The variables were tested for stationary and ordinary least square (OLS) method. The paper also reveals that GDP per capita, inflation and trade balance are the macroeconomic variables that effected Somalia exchange rate. Based on the findings in this study, it concludes that the exchange rates are high in Somalia and that they are on increase. The result concludes that exchange rate in Somalia is significantly affected by Trade balance, inflation and GDP per capita.

The study of findings and discussions conclude that the average trade balance is inversely related to exchange rates whereby an increase trade balance decrease the exchange rates in Somalia, Because the import in Somalia exceeds the export which leads deficit in trade balance which causes to increase the exchange rate in Somalia, the study suggests to achieve positive trade balance in order to stabilize the exchange rate, while GDP per capita and inflation have directly related to exchange rate whereby an increase one unit of them make to increase the exchange rate in Somalia, so that this study recommends that central bank of Somalia should enact policies that improve the political factor it contributes towards gaining value of the Somalia shilling.

REFERENCES

Adu, G. (2012). Studies on Economic Growth and Inflation. Faculty of Natural Resources and Agricultural Sciences.

Albuquerque, C. R., & Portugal., M. S. (2004). exchange rate and inflation: a case of sulkiness of volatility . The

Research Department of Central Bank of Brazil, 1-29.

Bhattarai, d. k., & Armah, m. k. (2005). The Effects of Exchange Rate on the Trade Balance in Ghana: Evidence from Cointegration Analysis. Centre for Economic Policy Business School, University of Hull , 1-37.

Dalmar, M. (2015). Somalia: The long road to currency reform. WardheerNews, 1-12.

Edwards, S. (2006). the relationship between exchange rates and inflation targeting revisited. national bureau of economic research , 1-45.

Fetai, B., Koku, P. S., Caushi, A., & Fetai, A. (2016). the relationship between exchange rate and inflation: the case of western balkans countries. Journal of Business,Economics and Finance, 360-364.

Genemo, K. B. (2017). Effect of Exchange Rate on Trade Balance in Major East African Countries: Evidence from Panel Cointegration. European Business & Management, 95-104.

Haddad, M., & Pancaro, C. (2010). Can Real Exchange Rate Undervaluation Boost Exports and Growth in Developing Countries? Yes, But Not for Long. Economic Premise, 1-5.

Howard J. Shatz, David G. Tarr,. (2000). Exchange Rate Overvaluation and Trade Protection:. the economic journal, 1-11.

Kharroubi, E. (2011). The Trade Balance and the Real Exchange Rate. BIS Quarterly Review. , 33-42.

Sabri, M. A. (2006). Impact of Per Capita Income on Exchange Rate with Regression Tool. 1-11.