DETERMINANTS OF REAL EXCHANGE RATES: A TEST OF RELATIVE PURCHASING POWER PARITY BETWEEN KENYA AND UGANDA

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DECLARATION

This research project is my original work and has not been presented for an award of a Degree in this or any other University.

Reg:No. D63/77996/2015

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This research project is dedicated to my late "Baba"**Sammy BiwottTanui**, who always believed in me and whose dream was to see me pursue my studies to the heights of intelligentsia club of the world…. I will forever prolong your legacy. *RIP*

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LIST OF ABBREVIATION

CPI	Consumer Price Index
EAC	East Africa Community
LOP	Law Of one Price
IRP	Interest Rate Parity
RIP	Real Interest Parity
PPP	Purchasing Power Parity
IMF	International Monetary Fund
CBK	Central Bank Of Kenya
NER	Nominal Exchange Rate
CBU	Central Bank of Uganda
OLS	Ordinary Least Square
GDP	Gross Domestic Product
CIP	Covered Interest Rate
UIP	Uncovered Interest Parity

ABSTRACT

Purchasing Power Parity theory (PPP) proposes that price levels for different nationalities, when expressed in a common currency, tend to be equal, indicating that the ratio of the aggregate price levels between two states tend equal the nominal exchange rate between the two currencies. The law of one price (LOP) from which the PPP concept is developed, states that similar goods will have the same price in different countries expressed in the local currency provided that the foreign trade barriers and transaction costs are not applied. Internationally, the concept of PPP is used as a principle determinant that enhances comparisons on income and expenditures. This makes it easy to arbitrate on equilibrium condition, for the asset markets and theoretical application in calculation of the exchange rates. This paper objectively attempts to find out if the PPP concept hold and whether there is causal-effect relationship in exchange rates and consumer price index between Kenya and Uganda. Secondary survey data was used, obtained from the Kenya Bureau of Statistics, Central Bank of Kenya, Uganda Bureau of Statistics and the International Monetary Fund. The Consumer Price Index were analyzed with the nominal Exchange rate for the period of five years collected monthly and computed annually (2010-2015). Correlation analysis and linear regression models were used to analyze data in order to draw relationship between exchange rates between Uganda and Kenya and the inflation rate.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

This thesis contains two interconnected research aspects that are casually related. The real exchange rate is an important relative price signaling interjectorily growth in the long-run. According to Caballero et al (1989) and Seven et al (1989) Exports and private investments in a given country are influenced by relative change in the nominal exchange rate (real exchange rate) and its stability in the market equilibrium. Policy issues that stand out in this regard for Kenya and Uganda include judging an appropriate level of the real exchange rate that is consistent with "sustainable" long-term capital in-flows, or the equilibrium real exchange rate. The other issue and also what level of real exchange rate will be in tandem with a more export – oriented economy in the future, with diminished dependence on the non-renewable resource base.

Purchasing Power Parity (PPP) is a crucial concept in the understanding of international finance. The concept is founded on a microeconomic theory known as the law of one price. The LOP suggests that an identical commodity, asset or security will sell at the same price irrespective of the location of the market, local or foreign.

Kenya and Uganda are the biggest economic players in EAC and that is demonstrated by their GDP. In this paper, the analysis focuses on possibility that Kenya and Uganda have achieved a sufficient degree of convergence. This is done by empirically analyzing the purchasing power parity using the nominal exchange rates, and the inflation rates for the two countries between 2010 and 2015 collected monthly but computed annually. The three theories that is Purchasing Power Parity theory, Fisher Effect theory and The International Fisher Effect Theory have been discussed in this paper and their application in the economic integration between Kenya and Uganda. The paper applied multi linear model to establish whether relative and absolute purchasing power parity do hold between Kenya and Uganda by linearlycovering three

macroeconomic variables which are Consumer Price Indices, Price Indices and Nominal Exchange Rates for a period of five years for the two countries.

1.1.1 Real Exchange Rate

Exchange rates is approached in two ways, first as a ratio of foreign to local goods, and second as a measure of the strength of local to foreign currency.

This is expressed as follows;

RER=e=E P*/P

where, *e* is the real exchange rate, *E* is the nominal exchange rate expressed as the local currency price of a foreign currency, *P** is the foreign price level, and *P* is the local price level. Most of the developed countries have adopted this definition because it is *PPP based.*

The other way of defining the real exchange rate derives from the "Well known Salter-Swan non-traded goods model". The real exchange rate in this sense is defined as the ratio of the price of traded goods to non-traded goods (or its inverse); traded goods,3 and E is the nominal exchange Rate.

RER= e= E P*T/PN

Where, P*N is the world price for traded goods, PN is the domestic price of non-traded goods and E is the nominal exchange rate.

Real Exchange Rate = (nominal exchange rate) x (Price of the good X abroad/Price of good X at home)

The real exchange rate plays a crucial role in guiding the broad allocation of production and spending in the home economy between foreign and local goods. Literature has shown that export growth, consumption, resource allocation, employment and Private Investments are greatly influenced by the real exchange rate's level, relative to an equilibrium real exchange rate

level and its stability(Aron et al., 1997). Therefore, in the light of the latter, emerging economies in particular, are encouraged to conduct their macroeconomic policies in such a manner to get the relative price and the real exchange rate right.The right real exchange rate is one that does not stray too far from its equilibrium value.

1.1.2 Determinants of Real Exchange Rate

Past studies on the determinants of the real exchange rates and other related areas have

Have been incomplete the focus of the same matter. From a theoretical model developed by Edwards (1989) a relationship that would predict exchange rate behavior was summed up in a n empirical equation. According to this research, there are real variables that affect the long-run equilibrium exchange rate and can be categorized as internal and external fundamentals.

In the short-run however, the real exchange rate may be affected by both real and nominal factors. The important fundamentals that determine the real exchange rate are the terms of trade, level and composition of government consumption, controls on capital flows, exchange and trade controls, technological progress, and capital accumulation

1.1.2.1Terms of Trade

Terms of trade are defined as the relative price of exports to imports. The impactof a change in the terms of trade on the real exchange rate is theoretically ambiguous (see Elbadawi and Soto, 1997, Aron *et al,* 1997, Baffes*et al,* 1999, and Edwards. 1989). This is because the direct income effect operating through thedemand for non-tradable may dominate the indirect substitution effect that operates through the supply of non-tradable. For example, to illustrate the impact of the direct income effect, let the price of exports increase, and the price of imports stay constant. This will increase the income of a country whose price of exports has increased (an improvement in the terms of trade). In turn, the increased income raises the demand for all goods, imports and non-tradable goods. Since the price of imports is given, the higher demand would not affect the price of imports.However, the price of non-tradable goods would increase due to the high demand, and hence a real exchange rate appreciation will occur. If deterioration in the terms of trade occurred, it may lead to the opposite effect; reducing income and demand for all goods and hence resulting in depreciation in the real exchange rate.

Sometimes, the indirect substitution effect may dominate the direct income effect, leading to opposite results of any terms of trade effects analyzed above. For example, an improvement in terms of trade may provide sufficient foreign exchange resources to producers of non-tradable goods in the economy. Being one of the factors influencing production, the increased resources may then enable the producers to increase their production of non-tradable goods, hence lowering its price. The improvement in the terms of trade may thus lead to a depreciation in the real exchange rate. If terms of trade deteriorated, the producers would face foreign exchange constraints and hence their procurement of inputs for producing non-tradablewould be constrained. The constraints in the procurement of inputs would then reduce production and increase the price of non-tradable, leading toan appreciation in the real exchange rate. In Elbadawi and Soto's (1997) study of seven developing countries, in three cases, an improvement in the terms of trade appreciated the real exchange rate, while in four cases, an improvement in the terms of trade depreciated the real exchange rate. Feyzioglu (1997) also found that an improvement in the terms of trade appreciated the real exchange rate for Finland.

Real exchange rate is also variant on the type of the Trade policy between two markets. Direct changes relating to import tariffs have a key influence on the pricing of domestic products.
The overall effect is an increase in the exchange rate of the local currency and a drop in the local commodity prices. An increase in import tariffs can have the opposite effect. That is, it can raise the domestic price of imports, thereby depreciating the real exchange rate. Exchange rate is also affected by the growing demand for imports, which triggers an upsurge in foreign exchange rates.
However, the demand for imports and consequently for foreign exchange will increase, leading to a depreciation in the real exchange rate. In their study of Côte d'Ivoire and Burkina Faso, Baffes *et al* (1999) found results consistent with the theory; that reforms that are aimed at liberalizing trade are consistent with a depreciated real exchange rate.

1.1.2.2Controls on Capital Inflows

Capital inflows affect the prices of tradable to non-tradable goods, and subsequently the real exchange rate. For example, if there is a huge capital inflow, it will increase the demand for non-

tradable commodities, hence raising the exchange rate for that product. This would in turn appreciate the real exchange rate. In his study of twelve developing countries, Edwards (1989) found that an increase in capital inflows appreciated the real exchange rate, as expected.

1.1.2.3Government Consumptions

Government spending also affects the real exchange rate. The impact of government consumption depends on whether such consumption is predominantly on traded goods or non-traded goods. Following Edwards (1989), we will illustrate this by assuming two periods, 1 and 2. We can further simplify the illustration by assuming away distortionary taxes. Let us assume an increase in government consumption of non-tradable in period 1. Assume further that borrowing from the public or international sources finances this. The equilibrium real exchange rate will be affected in two possible ways. Period 1 may witness an increase in demand for goods and services, which will lead to an increase in the price of non-tradable. This will lead to an appreciation in the equilibrium real exchange rate. However, in period 2, the government may have to hike taxes to pay the debt. This may reducedisposable income, and hence reduce aggregate demand. Such a movement will reduce the price of non-tradable, and thus lead to a decrease in the equilibrium real exchange rate. From this, it may be noted that it is not possible to tell a priorithe effect of changes in government consumption of non-tradable on the equilibrium real exchange rate. The same situation obtained in analyzing the impact of changes in government consumption of tradable on the equilibrium real exchange rate (Edwards, 1989). Edwards (1989) found that an increase in government consumption appreciated the real exchange rate in four of the equations he estimated for a group of twelve developing countries, while in the other two equations; an increase in government consumption depreciated the real exchange rate.

1.1.2.4Exchange and Capital Controls

Relaxation of capital controls may affect the movements of the real exchange rate. If liberation of capital controls leads to an increase in net capital inflow it will result in the expansion of monetary base. This raises current expenditure over income and increases the demand for non-tradable resulting in an appreciation of the equilibrium RER. A fall in world real interest rates of a rise in international transfers such as foreign aid flows also affects the equilibrium RER. In a

similar way to net capital inflow if the major share of foreign aid is spent on non-tradable the price of tradable will be pushed down relative to non-tradable which tends to appreciate the RER

1.1.2.5Growth Rate of Real GDP and Technological Progress

The growth rate of real Gross Domestic Product is normally used in empirical studies to proxy technological progress (Edwards, 1989). Ricardo is said to have been the first one to postulate a negative relationship between economic growth and the relative price of tradable to non-tradable goods. Other authors also pointed out the tendency for the relative price of tradable to non-tradable to decline over time. For example, Balassa indicated that the rate of productivity growth is higher in countries with higher rates of growth, and that within these countries, the productivity gains are higher in the tradable sector (Edwards, 1989). Edwards (1989) formally incorporated the effect of technological progress in his model. According to this model, exchange rates are bound to rise or drop based on the influence of technology. The extent to which technology is driving operations in different sectors of the economy the cumulative effect would be considered as either product or factor augmenting (Edwards, 1989:48). If any productivity shock occurred, it would have a positive income effect, which would in turn generate a positive demand pressure on non-tradable goods. The increased demand would increase the price of non-tradable, and hence lead to an appreciation in the real exchange rate.

However, technological progress could also depreciate the real exchange rate. This could happen if technological progress resulted in supply effects and if these more than offset the demand effects. The implication is that technological progress could appreciate or depreciate the real exchange rate. Edwards (1989) found that an increase in technological progress depreciated the real exchange rate in all his regressions. Aron *et al* (1997), on the other hand, found that an increase in technological progress appreciated South Africa's real exchange rate

1.1.3Purchasing Power Parity and Real Exchange Rate

The Swedish Economist Gustav Casselin1920s was the first one to develop the theory of PPP and used it to examine the relationship between the exchange rates of different countries. Given that the nominal exchange rate is the price of one currency in terms of another, then it follows

that the real exchange rate is the nominal exchange rate adjusted for relative national price level differences.The real exchange rate is constant if the PPP theory holds between two foreign markets, in that changes in the real exchange rate reflect the deviations from PPP (Sarno and Taylor,2002).

Real exchange rate is defined as R=EP*/P, WHERE the exchange rate, E, is the domestic currency price of foreign currency (pesos per dllar), P* is a measure of the foreign (U.S.A) price level, and P is a measure of the domestic (Guatemala) price level. Real decrease in this paper will refer to an increase (decrease) in R. Letting lowercase letters denote logarithms and rearranging gives:

$e = r + p - p^*$.

Absolute holds that R is unity, so that r is zero. Relative PPP holds that is some non-unitary constant, so that the change in r is zero. In either case, the exchange rate is purely nominal variable. Ceteris Paribus, the (log) exchange rate is proportional to the (Log) foreign domestic price level, with factor of proportionality equal to one, and inversely proportional to the (LOG) foreign price level, with factor of proportionality minus one. If the real exchange rate is not constant, however, then exchange rate changes can reflect both real and nominal influence.

Discussing real exchange rate changes requires being more specific about the price indices represented by P and P*, with different real exchange rate concepts arising from different choices of price index (Edwards (1989)). One approach is to define the real exchange rate as the ratio of foreign and home consumer price indices (CPI) expressed in a common currency. If the purchasing powerof a national currency is best measured by the reciprocal of a country's CPI, and if one wants to test whether the purchasing powers of national currencies are equalized internationally, then this is a logical choice for defining the real exchange rate. With non-traded goods in the CPI, however, absolute PPP needs not hold even if the law of one price holds for all traded goods.

Relative PPP need not hold if the relative price of nontraded goods to traded goods evolves differently in the home and foreign country, the Balassa-Samuelson effect (Balassa (1964)) and Samuelson (1964)). Alternatively, Williamson (1994) argues that since the nominal exchange rate is the relative price of two national monies, the real exchange rate must be the relative price of two national outputs. This leads to defining the real exchange rate as the ratio of foreign and home GDP deflators expressed in a common currency. With heterogeneous national outputs, this

real exchange rate as the ratio of foreign and home GDP deflators expressed in a common currency. With heterogeneous national outputs, this real exchange rate has a term of trade dimension, and there is no reason to expect it to be constant.

1.1.4Exchange rateand PPP rate between Kenya and Uganda

Purchasing power parity is a theory which states that exchange rates between two countries are in equilibrium when their purchasing power is the same in each of the two countries. This suggests that the exchange rates in comparison for the two countries equal their price levels for a fixed basket of goods and services. When a country is experiencing inflation the domestic price levels increase exponentially and therefore the exchange rate must depreciate in order to return to PPP.

PPP can be used to answer the question of how currencies are overvalued or undervalued by comparing the PPP of a currency calculated below with its actual exchange rate relative to the Uganda shilling and relative to Kenya shilling respectively by using charts in the data analysis.

$$S = \frac{P_1}{P_2}$$

Where:

S represents the exchange rate of Kenya shilling to Ugandan shilling

P1 is the cost of goods in Kenya

P2 is the cost of goods in Uganda

1.2Research Problem

Inter-governmental Organization and regional bodies like the East African Community (EAC), requires a close analysis of their respective member state economic policies. The analysis will focus on policies that have a bearing on the level and stability of prices, and the exchange rates. As an investment zone the EAC countries will be engaged with investment and trade activities involving individual investors and the member states if they form an integrated economic co-operation.However common monetary policy in the region is still an issue that will need to be addressed and raises several research questions:

1. The question of real GDP per capita, state owned debt, consumer price index, exchange rates, and inflation among the five countries moving together is critical

2. The extent to which GDP of member states are vulnerable to the changes arising from the other EAC member states real GDP per capita, external debt, consumer price index and interest rates.
3. The extent to which ch GDP of member states can respond positively to changes in international markets as demonstrated in the local currency exchange rates against the dollar.

The validity of both absolute and relative PPP has been studied and empirically tested through various studies and all the literature has almost come to one conclusion of rejecting the absolute PPP while the relative PPP has received mixed reactions from researchers (Sosvilla-Rivero& Garcia, 2003). Literature regarding PPP can be drawn into two general conclusions, Eiteman, Stonehill and Moffet (2007), PPP holds well in the long run and poorly in the short run and also PPP is better applied in countries with relatively high rates of inflation and underdeveloped capital markets although there are existing controversies to this generalizations, (Cheng, 1999). According to a study done by Sarnpo L. Taylor in 1998, there was a very strong support for PPP even though this was done in a setting comprising of developed countries with relatively low inflation rates. This means the results were in opposition to the past research done to test international parity conditions. In kenya, empirical studies such as testing causal relationship between exchange rates and stock prices in Kenya, Kisaka (1999), Interest rates and exchange rates, Wambua (2006), real exchange rates and International trade, Nyamwange (2009), Inflation and exchange rates Opati (2009) exchange rate variability and investment decisions, Maina (2010), exchange rates and horticultural exportsNyachieo (2008) have not addressed the concern for test of parity between Kenya and the neighboring economies such as Kenya and Uganda. This study is specifically addressing this gap and find out if the relative or absolute parity holds between Kenya and Uganda and how it can be applied in determining the real exchange rates between the two countries.

1.3 Research Objective

To establish whether Relative Purchasing power holds between Kenya shilling and Uganda shilling.

1.4Value of the Study

Research on whether relative purchasing power hold between Kenya and Uganda has not been adequately explored as most studies have concentrated on the determinants of real exchange rates and purchasing power parity. Therefore, this study will help the researcher and future researchers to be able to grab the deeper insights on different economic concepts such as price law theory, purchasing power parity interest rate parity and the relationship between PPP and real exchange rate between countries.

The study will also furnish Investors both local and international with relevant information regarding the concept of purchasing power parity which will allow them to estimate what the exchange rate between two currencies would have to be in order for the exchange to be at par. Exchange rates do tend to move in the general direction of the PPP exchange rate and there is some value to knowing in which direction the exchange rate is more likely to shift over the long run.

The study will also help traders to know the inflation differentials between Kenya and Uganda in different periods hence make viable investment decision.

The research findings will be useful to the Central Banks in guiding activities and deliberations on monetary policy and determination of the Exchange rates.

The research will contribute valuable knowledge to the field of international finance and in management field providing the clarity in the concepts of purchasing power parity so that the other students can take the advantage of it.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covered the literature review on purchasing power parity. It encompasses the theoretical framework on purchasing power parity and evaluate what other researchers have written on purchasing power parity and its interrelation with exchange rate, interest rate and inflation. The chapter also includes empirical review on purchasing power parity and its interrelation while identifying the knowledge gap.

2.2Theoretical Review

The international parity conditions define the core of international finance, they explain how Inflation rates, interest rates and the exchange rates are interlinked in the international markets. The theory of Purchasing Power Parity, which is a proponent of existence of a constant long-run equilibrium real exchange rate, Fisher Effect (FE) which tests the relationship between difference in inflation rates and difference in nominal interest rates and the theory of International Fisher Effect that attempts to draw relationship between real exchange rates and real interest rate differentials. If goods, assets and services are fully integrated, that is free movement of goods and services between two international markets then the three theories discussed above will hold and the economies in question can establish an economic block without being pensive of serious turbulence and asymmetric shocks in the economic factors.

2.2.1Purchasing Power Parity

PPP can be defined as the rate between two currencies that would equate national and foreign levels when expressed in a common currency, Sarno and Taylor (2002)

Let us look at the law of one Price for goods i:

$pt(i) = p* t(i) + st,$

Applying this law internationally, we will have a PPP that holds in relating the price levels to the nominal exchange rates hence the theory PPP assumes the application of the LOP. In this case the aggregate price of goods will cost the same price in the foreign country as the home country when the local currency is equated into the foreign currency. The failure of that will result in physical arbitrage of the same commodity, Solnik, (1978).

PPP is the international augmentation of the LOP and proposes that the same quantity of commodities in one economy Y, should cost the same in another economy X if the price is equated to the currency in economy X. This aspect is tied to the different exchange rates in different republics. Eun & Resnick, (2010) defines absolute PPP with the argument that, the exchange rates between currencies should be a reflection of the price variations between the two countries in question. This implies that should countries will similar PPP, are expected to have the same the same valuation for similar commodities when the exchange rate is factored. Arbitrageurs will ensure that the prices are in an equilibrium between two nations if the local tradable goods are perfectly similar to those produced in the foreign market in an efficient market environment, domestic goods are exact substitutes of the foreign goods. Market changes in one country that causes the price levels to change, will affect the exchange rate between this country and all others if these market and price changes only affect that one country.

However, there are several criticisms of absolute PPP arguing that this is more near impossible situation supporting the existence of a relative PPP instead. Relative PPP relates the extent of inflation between that have an exchange rate relating to their currencies. This therefore, means that countries with a relative PPP should have an inflation rate that closely corresponds to their exchange rate, Eun& Resnick 2010. In other words, the relative PPP would predict to what degree the currencies have to appreciate or depreciate in order to converge, Eiteman, Stonehill& Moffett 2010.

In summary, PPP explains that market influence on the exchange rates correspond to changes in market prices. However, due to trade barriers imposed on different tradable goods like profit margins and tax tariffs, it is very unlikely that the theory of PPP will hold.

2.2.2Fisher Effect (FE)

The EF states that the real interest rate plus compensation for the expected inflation will equal to the nominal interest rate.

The Fisher relation is:

$$(1 + \rho t)(1 + \pi t) = (1 + rt)$$

Where: ρ = represents the real interest rate

π = the expected inflation rate

The rates of return from an asset can be referred to in terms of units of currency and the quantities of commodities that can be bought. The former refers to the nominal interest rate of while the latter refers to the real interest rate (Sarno and Taylor, 2002). Inflation devalues the currency and that can be explained in terms of the general and sustained increase in price levels without a change in quantity of product purchased. A reliable value of real interest rate would be obtained by subtracting inflation from the nominal rate.

The linear version of this relation is: $r = \rho + \pi$

2.2.3The International Fisher Effect

The Fisher effect states that an increase in the expected inflation rate in a country will cause a proportionate increase in the interest rate in that country. This implies that the expected inflation rate is the difference between the nominal and real interest rate in each country. This relation should hold in each country as long as the bond market is efficient (Eun& Resnick, 2010).

The international Fisher effect is instead the relationship between the percentage change in the spot exchange rate over time and the differential between comparable interest rates in different national capital markets. This means that the international Fisher effect states that the nominal

interest rate differential reflects the expected change in exchange rate. Hence, if Kenya has a lower nominal interest rate than Uganda, the ksh is expected to appreciate against the Ugshby approximately the difference between the nominal interest rates (Eun& Resnick, 2010). If the international Fisher effect holds, an investor should be indifferent to whether he buys a bond in one currency or another, because competition between investors will make sure that there is no difference (Eiteman, Stonehill, & Moffett, 2010). The international fisher effect works due to the fact that investors must be rewarded or penalized to offset the expected exchange rate changes (Eiteman, Stonehill, & Moffett, 2010). This condition again tells us how the competitive position is likely to be affected by changes in interest rates. According to the purchasing power parity and the international fisher effect exchange rates, interest rates and inflation, tends to return to equilibrium over time, and therefore it is expected that exposure declines with time-horizon .

2.2.4Interest rate parity

The interest Rate Parity (IRP) is another arbitrage condition, which holds when international financial markets are in equilibrium, and is also a manifestation of the LOP applied to international money market instruments (Eun& Resnick, 2010). The IRP states that the exchange rate forward premium or discount, defined as the percentage difference between the spot and forward exchange rate, should equal the percentage difference between the interest rates of similar securities in the two countries. The IRP links interest rates in two different countries, and when it holds, you will be indifferent between investing your money in your home country or investing in a foreign country using a forward hedge, as the forward premium or discount should be equal to the difference between the interest rate in the two countries (Solnik, 1978). The IRP thus states that when interest rates in two countries change vis-à-vis each other, this affects the exchange rate, as either the forward exchange rate or the spot exchange rate will have to change in order for the IRP to hold. The forward exchange rate discount or premium tells whether the given currency is expected to appreciate or depreciate, and again this will affect the competitive position of the firms operating in the given country.

2.3International Parity Condition

2.3.1Purchasing power parity

The purchasing power parity (PPP) is one of the most extensively studied relationships in the Internationaleconomics. It can be written as follows:

$ppp = p + p^* - s$

where *t ppp*is the deviation from PPP (alternatively, the real exchange rate multiplied by -1), *t p* and **t p* are, respectively, domestic and the foreign price levels, and *t s* is the spot exchange rate (in price notation, i.e. the price of foreign currency in units of domestic currency)(Sarno and Taylor,2002). All lowercasevariables in this paper, except for the bond yields or interest rates, are in logs so that their first differences can be interpreted as the rates of change in the underlying variable. Empirically, thePPP condition is verified if *t ppp*is a stationary process. (Eun& Resnick, 2010).

2.3.2Uncovered Interest Parity (UIP)

The Uncovered Interest Parity is a condition stating that the difference in interest rates between the countries is equal to the expected changes in exchange rates between the countries' currencies.

$Et(\Delta St+m) = Itm - Itm^*$ *E q 1*

Where *Et* denotes the expected value given the information set available at time *t*, Δ is the difference operator and Itmand Itm* are, respectively, the domestic and the foreign nominal treasury bills with maturity, *m*(Eun& Resnick, 2010). Thus, the UIPpostulates that the expected rate of denomination of the domestic currency should be equal to the home vs. foreign interest spread. Assuming rational expectations:

$\Delta St+m = Et(\Delta St+m) + \varepsilon t+m$ *E q2*

where

$\varepsilon t$is a white noise error term,

combining eq 1 and 2

$\Delta St+m - (Itm - Itm^*) = \varepsilon t+m$

Under the assumption of rational expectations, testing the UIP amounts to testing whether $\varepsilon t+m$in above is stationary.

2.3.3Real Interest Parity (RIP)

Real interest parity condition is a is a parity condition which reveals when uncovered interest rate parity and purchasing power parity (PPP) hold, the two parity conditions together reveal a relationship among expected real interest rates, wherein changes in expected real interest rates reflect expected changes in the real exchange rate.Eun& Resnick, 2010).

$Rtm = Rtm^*$

In its testable version

$Rtm - Rtm^* = Vtm$

Where $Rt$and Rtm^* are the domestic and the foreign real treasury bills with maturity, m, respectively.If the RIP holds, then Vtm, which is the empirically observed real interest differential between the home and foreign country, should be a stationary process.(Sarno and Taylor, 2002).A useful relation in international parity relations is the Fisher decomposition stating that the nominal interest yield is the sum of the real yield and the expected inflation rate over a given period (t to $t + m$):

Using the Fisher decomposition, this can be rewritten in the following way:

$Itm - Itm^* = Et(\Delta Pt+m - \Delta Pt+m^*) + Vt$

Again assuming rational expectations

$(Itm - Itm^*) - (\Delta Pt+m - \Delta Pt+m^*) = Vt$

From the equation above the RIP holds empirically if the difference between the interest rate spread and the inflation differential is stationary.

2.4Empirical Studies

The parity conditions under analysis have been subject to empirical studies in the past although the conditions under those circumstances were separate. In this case however, the modeling approach was originally done by Juselius and MacDonald (2004a), who were interested in the parity relations between Germany and the US. A similar approach was taken by Stazka (2008), who scrutinized parity relations between Germany and Poland. This research follows the same approach to establish the parity relationships between Kenya and Uganda.

Stazka's analysis did not find any evidence that the parities, or any linear combinations of them, held for their data set. They identified two long-run equilibrium relations: (1) the relation imposing a long-run homogeneity restriction on the domestic and foreign inflation and the domestic interest rate and (2) the relation that brings together the domestic real interest rate and the foreign inflation. Juselius and MacDonald (2003) found out that the joint modeling of international parity conditions, namely Purchasing Power Parity (PPP) and the Uncovered Interest Parity (UIP), produces stationary relations showing an important interaction between the goods and the capital markets. Franco (2006) found results consistent with those of Juselius and MacDonald (2003). Frankel (1993) discusses the relationship between the different theories and assumptions, while Meese and Rogoff (1988) probably provides the classic derivation of the relationship between real exchange rates and real interest rates investigated here.

The relationship between exchange rates and nominal interest rates is captured in two propositions: one the covered interest parity theorem (CIP) which deals with a no-arbitrage equilibrium in international financial markets, and the speculative efficiency hypothesis and the resulting uncovered parity theorem (UIP) which deals with a speculative equilibrium in international financial markets. The three parties have been analyzed very extensively using various methods; theoretical and empirical studies in this field are discussed at length in the meta-studies of MacDonald (1998) and Sarno (2002). The general upshot of this literature is that the parities, taken alone, seldom hold empirically in typical data samples. Only for very long time series, spanning a century or so, or for panel data of large dimensions can the parities be empirically verified the empirical methodology in this paper follows the approach put forward by Juseliusand MacDonald (2004a), who jointly scrutinize the international parity relations between

Germany and the USA.Their analysis strongly rejects the stationarity of single parities, but by allowing the latter to be interrelated it recovers their stationarity. The authors also argue that the apparent nonstationary of the simple parities is due to very slow adjustment to sustainable exchange rates

Locallythere have been few studies that have investigated the determinants of the real exchange rate of the Kenyan shilling include the pioneering work of Mwega (1990). Musyoki, Pokhariyaland Pundo (2000) were reviewed in the previous sub-section on empirical literature from other developing and emerging markets. As noted there, the main finding in this study is that, in the long run, only real variables affect long run equilibrium real exchange rates of a panel of 12 developing countries, including Kenya, while in the short run the real exchange rate is driven by both real and nominal factors. However, since the study employed panel methods, it did not provide a specific result for Kenya.

Ndung'u (2001) employed a co integration framework with single equation equilibrium error correction models to investigate the short and long run determinants of the quarterly real effective exchange rate for Kenya, over the period 1970:1 – 1995:1. Ndungu found a co integrated equilibrium from a theoretical model characterizing equilibrium as the attainment of both internal and external balance for sustainable capital flows and trade tax regimes, given terms of trade and technology. Specifically, they estimate an equation based on the following explanatory variables

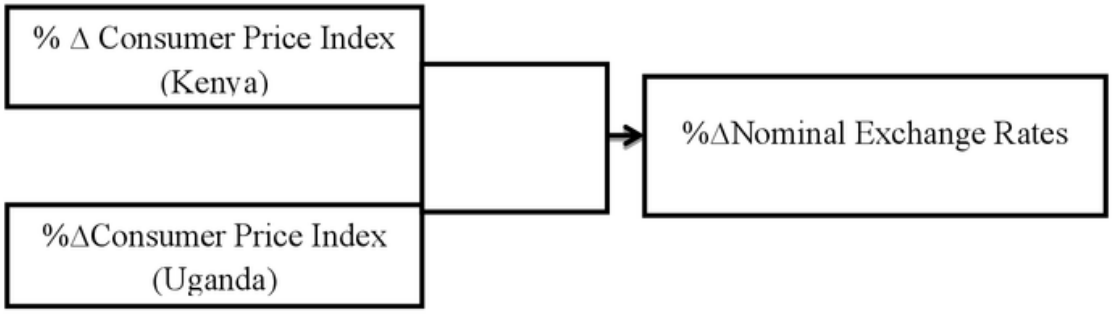
Finally, Kiptoo (2003) also estimate the equilibrium real exchange rate for Kenya using the Johansen co integration estimation procedure and data spanning from 1970:1 – 2002:1. The explanatory variables included in their model include real interest rate differential, real GDP per capita relative to trading partners (productivity), real commodity prices, openness, the ratio of fiscal balance to GDP and the ratio of net foreign assets of the banking system to GDP.

2.5Summary Of Literature Review

The main objective of this chapter will be to investigate the potential determinants of the real exchange rate test on relative purchasing power parity. There are several theoretical models of the determination of the real exchange rate, let alone of its measurement, but the so-called fundamentals models have emerged as the most popular in empirical analysis on this subject. These models combine several other models to come up with potential fundamental international parity relation between Kenya and Uganda. In other words, they provide a unified dynamic framework for analyzing the behavior of the real exchange rate and interest rates. Howeveronly one empirical studies have been found in Kenya conducted specifically on the purchasing power parity. There is a research gap in studies focusing on whether purchasing power parity really hold between Kenya and Uganda The only study that has been done in this area utilizedVAR integrated vector autoregressive approach methodology to analyze the international parity relations. This study was only short term as it focused on only parity relations without the determinants of real exchange rates. It is hence important to understand the determinants of real exchange rates a test of purchasing power parity between Kenya and Uganda since the two countries are engaged in trade which brings forth a positive impact to the economy

Conceptual Framework

Independent Variable Dependent Variable



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the method that was utilized, the research design, target population and sample, data collection method, as well as data analysis approach

3.2Research Design

Burns and Grove(2003)define a research design as a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings.Parahoo(1997) describes a research design as a plan that describes how and whendata was collected and analysed. The study was a descriptive case study and it utilizedsecondary data.According to Burns and Grove (2003), descriptive research is designed to provide a picture of situations as it naturally happens.It may be used to justify current practice and make judgement and also to develop theories.

3.3Data Collection

Data collection is regarded as the procedure for collecting particular information, which is supposed to provide or reject the facts at hand. Consequently, the researcher obtained the prerequisite data to attain the set objectives. Secondary data was employed in this study. To test PPP in this research, Kenya-Uganda case study the researcher utilized the monthly secondary data. The consumer price index (CPI) will be taken from Central Bank of Kenya and Central Bank of Uganda. Data that has been collected by IMF in the last 15 years will be used to obtain information on nominal exchange rates for the entire period.

The latter acted as the foundation for computing the inflation rate differential between Kenya and Uganda. Consumer Price Index, Nominal Exchange Rates, Price Indices Secondary data on a monthly basis covering the period January 2010 and December 2015 was utilized in the estimations.Here Kenya was the Home country.

3.4Data Analysis Techniques

Data was analyzed through both quantitative and qualitative method. It was then presented using several statistical tools including tables percentages charts as well as graphs. This research utilized the Ordinary Least Square (OLS), which is a Linear model. This method enabled this research to test if relative purchasing power parity holds between Kenya and Uganda by using Multivariate regression analysis. The preference of the linear model accompanies its ability to allow a systematic way of capturing numerous dynamics in multiple linear regression. This multiple linear regression model was able to define the relationship for the changes in inflation rates (change in price indexes) and changes in the Nominal exchange rates in Kenya and Uganda. Multiple linear regression formula was employed to model the relationship between the explanatory variables and a response variable by fitting a linear equation to observed data.

3.5The Analytical Model

The research explored the vital macroeconomic variables' relationship and their effect on parity between Kenya and Uganda. Basically, the regression modeling technique is extensively utilized to estimate coefficients for independent variables, to test hypotheses, as well as, evaluate the importance of the independent variable in the model. Thus, multiple linear regression analysis was utilized to assess the link between the dependent variable and the independent variable of the study holding all other variables constant, and also to assess whether confounding exists. It offereda way of adjusting for (or accounting for) potentially confounding variables that have been included in the model. The study employed the test of goodness of fit and the Coefficient of determination R2.

The content of analysis are defined as follows:

$\%\Delta E=\beta 0+\beta 1\%\Delta P-\beta 2\%\Delta P^{*}+u$

Where

Y=$\%\Delta E$= Dependent Variable (the change of nominal exchange rate)

$\%\Delta P$ = Percentage change of the home (Kenya) price level (consumer price index)

$\%\Delta P^{*}$=Percentage change of the foreign (Uganda) price level. (consumer price index)

$\beta 0$=The arbitrary constant term (the intercept)

$\beta 1$--$\beta 2$=The coefficientsof the regressors

u=The error (residual) term

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter analyses data collected from the Kenya's and Uganda's central banks and relates to the market equilibrium between the two countries.

4.2 Data Presentation

The independent variables were the rate of change of the consumer price index of Kenya and that of Uganda predicting how they affect the dependent variable, exchange rate between the two countries to find the points of stationarity. The figures are the logarithmic equation of the variables to have normal distribution of the mean.

4.2.1 Nominal Exchange Rate

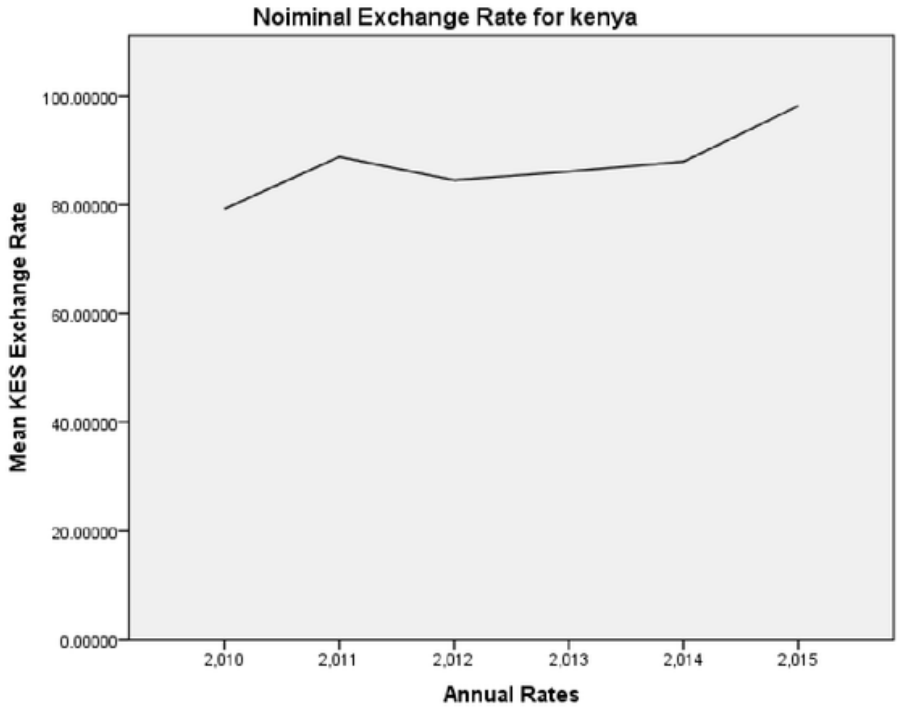


Figure 4.2.1 Showing depreciation in Kenya shilling as compared to the US dollar.

The figures were computed from the mean monthly averages of the currency from 2010 to 2015. Kenya has experienced a continuous gradual depreciation in the currency exempt 2012 where Kenya shilling appreciated to 84 shillings per USD**FIG 4.2.1**. 2014 to 2015 was a period of sharp increase in depreciation of the Kenyan currency which can be attributed to the expansive government borrowing locally and internationally to finance mega structural programs and also sustain the devolution which was has a huge current expenditure.

4.2.2 Inflation Pattern.

		Inflation Rate	
	ER	Kenya	Uganda
2010	5.56	5.27	5.38
2011	5.69	6.56	6.81
2012	4.94	5.26	17.82
2013	5.04	5.58	5.45
2014	5.39	5.49	5.18
2015	6.04	5.68	5.7

Figure 4.2.2 A comparison of the inflation rates in Kenya and Uganda and the change in exchange rates in the Kenyan currency for the same period.

There is close distribution of the mean for the two countries.A comparison of the mean exchange rates for every year from 2010 to 2015 shows results as per the table above shows that the average mean for every year in the two countries was relatively close apart from 2012 where Uganda had extremely high rate of inflation. The consumer price indices were used instead of the price indices of tradable and non-tradable goods because of its uniformity in the available data and also it was not feasible to get separate prices for the tradable and non-tradable goods in the two countries.

The figures are computed from the monthly Consumer Price Indices for Kenya and Uganda and inflation rates are calculated from the changes in the consumer price indices for the same period. The Inflation rate for the two countries is distributed close to the change in the nominal exchange rate for Kenya, **FIG 4.2.2** further supporting the theory of purchasing power parity between the two countries, which states that in the absence of trade restrictions, tariffs and arbitrage of goods, the real exchange rate between two countries is equal to one, the cost of a basket of goods in Kenya will cost the same in Uganda when converted into Kenyan shillings. However, there are periods of unstable inflation in the region between the two countries which shows spikes in the price of goods in Kenya and Uganda. Since 2013 the two countries have been recording high inflation rates which can be associated with economic restructuring and developmental projects in the region that have seen the countries into huge debts which have to be paid through taxation.

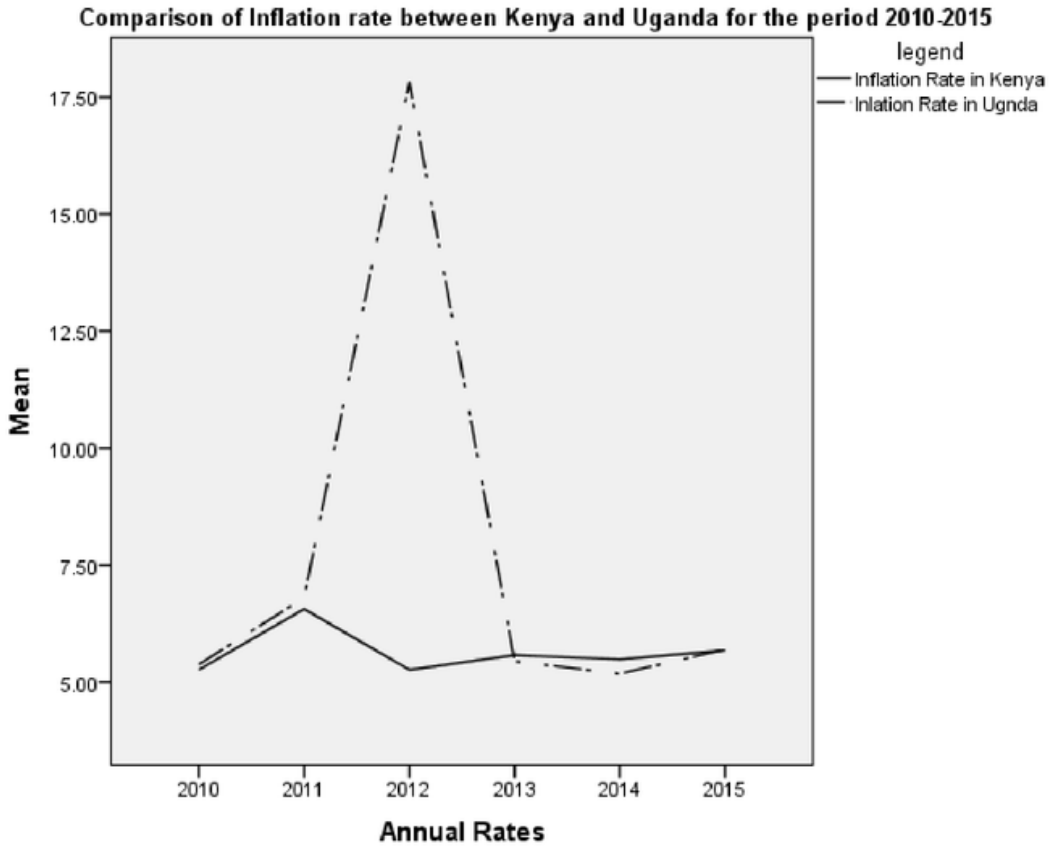


Figure 4.2.3 Shows the variation of the inflation rate in Kenya and Uganda from 2010 to 2015

The inflation rates in the two countries are fairly closely rated which supports the parity between the two countries. Year 2012 had a higher inflation rate compared to that of Kenya which can be attributed to stronger Kenyan shilling compared to that of Uganda in relation to the USD. Towards 2015 Kenyan shilling depreciated contributing to a market equilibrium between Kenya and Uganda as shown in the **FIG 4.2.3**.

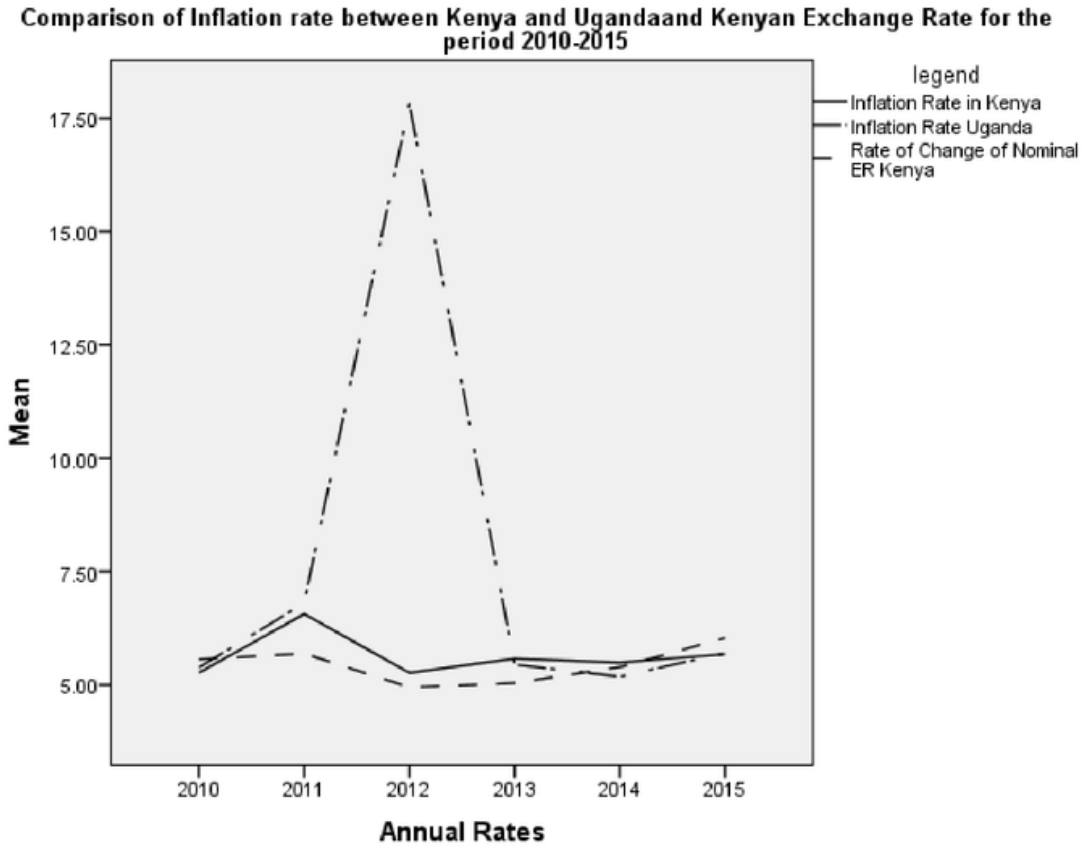


Figure 4.2.4 Showing the comparison of inflation rate between Kenya and Uganda and the Kenya Exchange Rate for the period 2010 to 2015

A comparison of the Change in Kenya Nominal Exchange rate and the inflation rate for the two countries shows that the nominal exchange rate appreciates with decrease in inflation rate in Kenya and increase in inflation rate in Uganda. For example,in 2012 when inflation rate in Uganda was averaging 17 points the nominal exchange rate depressed by close to 5 points in Kenya.

According to the purchasing power parity, $R = EP^* / P$ the real exchange rate is inversely proportional to the price of commodities in the home country and directly proportional to the price of similar goods in the foreign country. Kenya showed a fairly stable prices in its goods and

services as compared to Uganda which had exponential changes in its consumer price indices especially in the year 2012. However, its clear from the figure above that if the PPP theory holds, the exchange rates will keep adjusting in order to accommodate changes in consumer price indices in the tradable goods. The comparison of change in exchange rate for Kenya and its inflation rate shows a direct relationship between the two, for example increase in inflation rate in Kenya in 2011 was accompanied by a corresponding increase in rate of change in the exchange rate. Periods of stationarity in the determinants of real exchange rates was associated with a fairly constant change in the exchange rates.

The iconic increase in the inflation rates and the change of exchange rate in Kenya towards 2014 and 2015 can be attributed to the remarkable higher inflation rates in Uganda in the period 2012 and 2013 in order to maintain international arbitrage if the theory of PPP holds between the two countries.

4.3 Descriptive Statistics

Discuss the means, standard deviations, coefficient of variation, kurtosis and skewnes for each study variable.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Inflation rate in Kenya	71	4.1432	8.2019	5.645646	.6951150	1.051	.285
Inflation rate in Uganda	71	2.1015	10.1710	5.629393	1.0814219	1.171	.285
Inflation differentials	71	.8454	95.6751	6.242824	10.8085878	8.321	.285
Valid N (listwise)	71						

Figure 4.3.1 Showing Inflation rates for the period 2010 to 2015 in mean logarithmic forms

The mean inflation rate in Kenya for the study period was at 5.6, Uganda 5.6 and the mean differential in Inflation rate between the two countries was at 6.2.

The standard deviation from the mean for Kenya and Uganda was 0.7 and 1 respectively which supports the mean to be a true representation of the entire frequencies.

The differential mean for the entire period is close to the mean of the inflation rate which further supports the purchasing power parity which proposes that trade between two countries will adjust itself in order to maintain prices at equilibrium prices at a given exchange rate in relation to the USD.

4.3.1Relative prices and Inflation Differentials

Year	Relative change in prices	Inflation Differentials
2010	0.98	-1.14
2011	0.96	-2.44
2012	3.39	-125.55
2013	1.02	1.33
2014	1.06	3.07
2015	1	-0.22

Figure 4.3.2 The table shows that the inflation differentials were all positive apart from 2013 and 2014.

A positive inflation rate shows depreciation of the Kenyan currency in relation to that of Uganda while a negative differential shows appreciation in Kenyan currency in relation to that of Uganda.

A comparison of the changes in the prices indices between Kenya and Uganda; %change in the Kenya consumer price index, %change in the Uganda consumer price index, shows values that are close to 1. This indicates that the consumer price indices between the two countries are closely related and this can further be supported by the variation in the nominal exchange rates between the two countries.

4.4 Regression Analysis and Hypothesis Testing

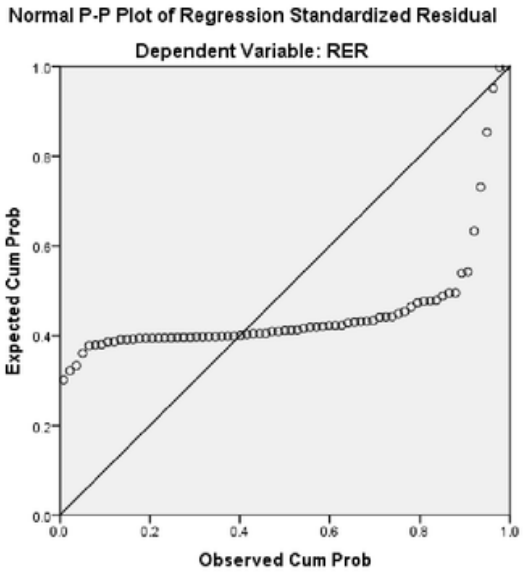


Figure 4.4.1 Showing Linear relationship between Kenya Inflation rate against that of Uganda

The scatter plots graph above shows the relationship between the inflation rate in Kenya Against the Exchange rate in Uganda. The plots show concentration along the line of best fit which suggests that the rates of inflation are adjusted to keep the two countries in Equilibrium

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.848[a]	.720	.711	.13361

a. Predictors: (Constant), Inflation rate in Uganda, Inflation rate in Kenya

Figure 4.4.2 shows model summary

The Summary Model shows that the there is strong degree of relationship between the variables, R=0.848 R square of 0.720. Change in the rate of exchange independent on the changes in the prices of goods in the home and foreign countries which accounts for over 72 % in variation.

This further affirms that there are other factors that determine the real exchange rates apart from the purchasing power of the countries in comparison. Other factors include terms of trade and trade policy between Kenyan and Uganda, controls of capital inflows, government consumptions and growth in real gross domestic product and technological progress.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.116	2	1.558	87.268	.000[b]
	Residual	1.214	68	.018		
	Total	4.330	70			

a. Dependent Variable: RER
b. Predictors: (Constant), Inflation rate in Uganda, Inflation rate in Kenya

Figure 4.4.3 Showing Analysis of Variance in independent variables change in consumer price index, inflation rates and the change in nominal exchange rate.

There is a linear relationship between the rate of inflation in Kenya and that of Uganda as can be deduced from the Analysis of Variance above, regression, 3.116, $p<0.05$

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.077	.137		7.887	.000
	Inflation rate in Kenya	.193	.025	.539	7.849	.000
	Inflation rate in Uganda	-.201	.016	-.874	-12.720	.000

a. Dependent Variable: RER, Independent Variables: Inflation Rates in Kenya and Uganda

Figure 4.4.4 Showing the coefficients analysis for the best model fit.

Given the model of this paper,

The relevant variables for this analysis were defined as shown below:

$\%\Delta E=\beta 0+\beta 1\%\Delta P-\beta 2\%\Delta P^{*}+u$

Where

Y=$\%\Delta E$= Dependent Variable (the change of nominal exchange rate)

$\%\Delta P$ = Percentage change of the home (Kenya) price level (consumer price index)

$\%\Delta P^{*}$ = Percentage change of the foreign (Uganda) price level. (consumer price index)

$\beta 0$= The arbitrary constant term (the intercept)

$\beta 1$--$\beta 2$= The coefficients of the regressors

u=The error (residual) term

Therefore, our regression equation

Y=$1.077+0.193\%\Delta P-201\%\Delta P^{*}$+.0137

4.5 Discussion of Research Findings

Kenya has experienced a continuous gradual depreciation in the currency exempt 2012 where Kenya shilling appreciated to 84 shillings per USD**FIG 4.2.1**. 2014 to 2015 was a period of sharp increase in depreciation of the Kenyan currency which can be attributed to the expansive government borrowing locally and internationally to finance mega structural programs and also sustain the devolution which was has a huge current expenditure.

The Inflation rate for the two countries is distributed close to the change in the nominal exchange rate for Kenya, **FIG 4.2.2** further supporting the theory of purchasing power parity between the two countries, which states that in the absence of trade restrictions, tariffs and arbitrage of goods, the real exchange rate between two countries is equal to one, the cost of a basket of goods in Kenya will cost the same in Uganda when converted into Kenyan shillings. However, there are periods of unstable inflation in the region between the two countries which shows spikes in the price of goods in Kenya and Uganda. Since 2013 the two countries have been recording high inflation rates which can be associated with economic restructuring and developmental projects in the region that have seen the countries into huge debts which have to be paid through taxation.

The inflation rates in the two countries are fairly closely rated which supports the parity between the two countries. Year 2012 had a higher inflation rate compared to that of Kenya which can be attributed to stronger Kenyan shilling compared to that of Uganda in relation to the USD. Towards 2015 Kenyan shilling depreciated contributing to a market equilibrium between Kenya and Uganda as shown in the **FIG 4.2.3**.

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According to the purchasing power parity, $R = EP^* / P$the real exchange rate is inversely proportional to the price of commodities in the home country and directly proportional to the price of similar goods in the foreign country. Kenya showed a fairly stable prices in its goods and services as compared to Uganda which had exponential changes in its consumer price indices especially in the year 2012. However, its clear from the figure above that if the PPP theory holds, the exchange rates will keep adjusting in order to accommodate changes in consumer price indices in the tradable goods. The comparison of change in exchange rate for Kenya and its

inflation rate shows a direct relationship between the two, for example increase in inflation rate in Kenya in 2011 was accompanied by a corresponding increase in rate of change in the exchange rate. Periods of stationarity in the determinants of real exchange rates was associated with a fairly constant change in the exchange rates.

The iconic increase in the inflation rates and the change of exchange rate in Kenya towards 2014 and 2015 can be attributed to the remarkably higher inflation rates in Uganda in the period 2012 and 2013. This happens in order to maintain international arbitrage if the theory of PPP holds between the two countries. Kenyan Currency appreciated in 2010 to 2012 and 2015 as compared to the Ugandan shilling which also appreciated in 2013 and 2014 as compared to the Kenyan shilling. According to Fun & Resnick (2010), absolute PPP holds if the exchange rate between two countries equals the ratio of the price levels in the two countries. Hence, if the conditions from above hold, identical products or services should be sold in two different markets at the same price in both markets when converted into a common currency. The analysis of the inflation rate differentials indicates that the exchange rate varies with the price variation in the two east African markets in order to maintain a state of equilibrium. However just as literature has disagreed with the theory of absolute PPP between two countries our findings indicates deviation from the equilibrium,1, across the continuum of time. This can be associated with factors such as differences in cost of production, profit margins, transportation costs, differences in brands, trade restrictions and policies and government borrowing and consumption.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter provides brief explanation of the findings chapter four, a conclusive remark from the study findings, recommendation arising from the study and limitations that were encountered in the course of this study.

5.2 Summary of Findings

The highest inflation rate was recorded in Uganda in 2012 which was associated with a relative depreciation in the Kenyan shilling. The Kenyan shilling appreciated in 2012 which could have contributed to the remarkable change in the consumer price index Uganda since the two countries are trading partners. It was found out that the inflation rate or changes in the local price indices is a reflection of the changes in the nominal indices as shown in **FIG 4.2.2.**Kenyan Currency appreciated in 2010 to 2012 and 2015 as compared to the Ugandan shilling which also appreciated in 2013 and 2014 as compared to the Kenyan shilling.

The regression equation, $Y=1.077+0.193\%\Delta P- 201\%\Delta P^{*}+.0137$, indicates that other factors that determine the real exchange rate play a bigger role in determining the price of goods across two countries. Previous literature has shown that it is almost impossible for absolute parity to hold given other determinants of real exchange rates such as a government consumption, trade terms and capital inflows.

5.3 Conclusion

This paper suggests that Kenya and Uganda been able to maintian a competitive biateral traing zone with each other in the long run. This can be an integrated trading zone if arbitrage works efficiently and each country succeeds in preserving its competitive position in terms of production of goods and services. However there are many policy implications that have to be followed in order to avoid deviations from the PPP:

First in oder for each country not to loose ground of its trading partners, wage and cost structure should remain in line with productivity levels and labor markets should remain competitive. Second, there must be a convergence in the structural and macroeconomic policies between the two countries. Reforms must be timely for economic efficiency and trade between Kenya and Uganda. In addition, a high degree of flexibility is required in the nominal exchange rate for the purposes of insulating both economies against lossses in real income that would otherwise emanate from slippages in macroeconmic policies.

Lastly, liberal traing regimes and econonmic integration will further promote interdependence and auto-correction mechanismbetween the two markets. As Adams Smith notes that wider markets promote growth, encouraging trade between Kenya and Uganda through inter alia, elimination of non tariff barriers and reduced tariffs, the two countries will be able to foster private sector growth and improve their economic levels. Private sector development and economic growth rely on the volume of trade and levelof integration between the two markets which can be achieved by integrating the traing and economic reforms between Kenya and Uganda.

5.4 Recommendations

This paper recommends integrated economic policies between the two countries given close relationship in their inflation rates and stability in the long run.

Differences in the sociopolitical and socioeconomic factors between the two countries should be further assessed in order to get a convergence in the macroeconomic and structural policies between the two countries. Factors such as government consumption and real gross domestic product and core pillars in determining fluctuations in the nominal exchange rate and therefore the two countries will have to address these disparities in order to clear deviation from the market equilibrium.

This study recommends other studies done on the parity testing in the four major economies of eastern African that tries to analysis purchasing power parity, fisher effect parity, interest rate parity and international rate parity amongst Kenya, Uganda, Tanzania, Rwanda, Burundi.

5.5 Limitations to the Study

The research concentrated on comparison of the change in the nominal exchange rate of Kenya alone. However, the change in the consumer price indices do not provide a clear picture of the exchange rates variation in response to inflation rates. It relied on secondary data which was extracted from CBK, CBU and statistics from IMF. These information was prepared by the management of the regulatory authorities, and that makes it subject to errors. Given that there is no any other independent data source to compare with the one from the regulatory authority, the data can be challenged because it may not be representative of a uniform market situation.

The % changes in consumer price indices was too small and this might have interfered with data distribution and mean calculation.

Use of the logarithmic estimates of the mean do not represent the exact original data

Accessibility of data from a foreign country was tedious and limited and this is why this paper was not able to consolidate data on nominal exchange rate of Uganda.

Another limitation is the methodology used does have its shortcomings. There are more advanced methodologies that give a more a more accurate test of PPP (See Serletis and Gogas, 2004). In addition, there may be factors (in the residual term) that may have affected or obscured the lack of existence of PPP in the Kenya-Uganda case study. These factors can include GDP growth rate, relative openness to trade during the time period selected and difference in exchange rate policy (Alba and Papell, 2007).

5.6 Suggestions for Further Research

There exist other factors that affect the exchange rates between the two countries and therefore more studies on the relative factors affecting trade between the two countries need to be studied and how they affect the rate of exchange between the two countries.

Exchange rate can also have effects on inflation of the economy. Here, there should be research to establish to what extend the fluctuation affects inflation. Floating of currency and putting controls on currency trading can have effects on the economy. This should be established by doing a research that can put comparison between the period when Kenya had currency market controls and when it floated its currency.

Empirical studies on the international fisher effect and fisher effect between the two countries as a test of parity need to be carried out to find out where the two countries converge in the long run.

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APPENDIX I

Montly Consumer Price Index for Kenya and Uganda from 2010 to 2015

Month	Year/currency	CPI KENYA(P)	CPI UGANDA (P*)
1	2010	104.89	99.36
2	2010	105.18	99.78
3	2010	104.97	100
4	2010	105.56	101.2
5	2010	105.79	101.3
6	2010	105.61	101.5
7	2010	105.98	101.8
8	2010	106.25	101.9
9	2010	106.74	102.7
10	2010	106.97	102.5
11	2010	107.86	102.6
12	2010	108.01	103.6
1	2011	110.57	105.2
2	2011	112.06	106.6
3	2011	114.62	109.3
4	2011	118.29	111.8
5	2011	119.48	112.7
6	2011	120.91	114.5
7	2011	122.44	119.1
8	2011	123.97	119.9
9	2011	125.23	126.1
10	2011	127.2	127.5
11	2011	129.13	127.7
12	2011	130.09	128.3
1	2012	130.82	129.4
2	2012	130.76	132.7
3	2012	132.51	132.6
4	2012	133.74	133.4
5	2012	134.09	133.1
6	2012	133.06	131.7
7	2012	131.92	131.5
8	2012	131.51	131.8
9	2012	131.89	132.5
10	2012	132.46	1335

11	2012	133.33	1338
12	2012	134.25	134
1	2013	135.62	134.1
2	2013	136.59	135.5
3	2013	137.96	136.6
4	2013	139.28	137.6
5	2013	139.52	138.93
6	2013	139.59	138.9
7	2013	139.87	139.6
8	2013	140.29	142.1
9	2013	142.28	142.5
10	2013	142.75	141.5
11	2013	143.14	141.6
12	2013	143.85	141.3
1	2014	145.4	141.2
2	2014	145.95	142
3	2014	146.61	143.7
4	2014	148.2	143.5
5	2014	149.7	143.2
6	2014	149.91	142.5
7	2014	150.6	143
8	2014	152.02	144
9	2014	152.24	144.8
10	2014	151.92	144.8
11	2014	151.85	144.6
12	2014	152.51	144.4
1	2015	153.43	145.8
2	2015	154.14	146.5
3	2015	155.14	148.8
4	2015	158.7	150.6
5	2015	159.98	150.4
6	2015	160.46	149.9
7	2015	160.57	151.2
8	2015	160.9	152.5
9	2015	161.33	154.6
10	2015	162.13	156.1
11	2015	164.72	156.6
12	2015	165.37	157

APPENDIX II

Montly Nominal exchange Rates for Kenya per USD

Nominal Monthly Average Exchange Rates (local currency per USD)

Month	Year/currency	Shillings
		E
1	2010	75.786
2	2010	76.731
3	2010	76.947
4	2010	77.254
5	2010	78.541
6	2010	81.018
7	2010	81.426
8	2010	80.440
9	2010	80.912
10	2010	80.714
11	2010	80.460
12	2010	80.568
1	2011	81.029
2	2011	81.473
3	2011	84.206
4	2011	83.890
5	2011	85.433
6	2011	89.049
7	2011	89.898
8	2011	92.786
9	2011	96.357
10	2011	101.270
11	2011	93.676
12	2011	86.663
1	2012	86.343
2	2012	83.176
3	2012	82.897

4	2012	83.188		
5	2012	84.385		
6	2012	84.789		
7	2012	84.140		
8	2012	84.075		
9	2012	84.613		
10	2012	85.112		
11	2012	85.629		
12	2012	86.010		
1	2013	86.900		
2	2013	87.446		
3	2013	85.818		
4	2013	84.189		
5	2013	84.146		
6	2013	85.489		
7	2013	86.860		
8	2013	87.493		
9	2013	87.413		
10	2013	85.310		
11	2013	86.103		
12	2013	86.309		
1	2014	86.214		
2	2014	86.278		
3	2014	86.489		
4	2014	86.716		
5	2014	87.412		
6	2014	87.612		
7	2014	87.769		
8	2014	88.106		
9	2014	88.836		
10	2014	89.227		
11	2014	89.963		
12	2014	90.444		

1	2015	91.358		
2	2015	91.489		
3	2015	91.727		
4	2015	93.438		
5	2015	96.389		
6	2015	97.705		
7	2015	101.196		
8	2015	102.431		
9	2015	105.275		
10	2015	102.779		
11	2015	102.168		
12	2015	102.187		

APPENDIX III

Percentage changes of Nominal Exchange Rates and Consumer Price Indexes.

Month	Year/currency				
		% CHANGE E	% CHANGE(P)	% CHANGE(P*)	% CHANGE (P-P*)
1	2010				
2	2010	1%	0.002764801	0.004227053	-0.001462252
3	2010	0%	-0.001996577	0.002204851	-0.004201428
4	2010	0%	0.005620654	0.012	-0.006379346
5	2010	2%	0.002178856	0.000988142	0.001190713
6	2010	3%	-0.001701484	0.001974334	-0.003675818
7	2010	1%	0.003503456	0.002955665	0.000547791
8	2010	-1%	0.002547651	0.000982318	0.001565332
9	2010	1%	0.004611765	0.007850834	-0.003239069
10	2010	0%	0.002154769	-0.00194742	0.004102188
11	2010	0%	0.00832009	0.00097561	0.00734448
12	2010	0%	0.001390692	0.009746589	-0.008355897
1	2011	1%	0.023701509	0.015444015	0.008257494
2	2011	1%	0.013475626	0.013307985	0.000167642
3	2011	3%	0.022844905	0.02532833	-0.002483426
4	2011	0%	0.032018845	0.022872827	0.009146018
5	2011	2%	0.010060022	0.008050089	0.002009933
6	2011	4%	0.01196853	0.015971606	-0.004003076
7	2011	1%	0.01265404	0.040174672	-0.027520632
8	2011	3%	0.012495916	0.006717045	0.005778872
9	2011	4%	0.010163749	0.051709758	-0.041546009
10	2011	5%	0.015731055	0.0111023	0.004628755
11	2011	-7%	0.015172956	0.001568627	0.013604329
12	2011	-7%	0.007434368	0.004698512	0.002735856
1	2012	0%	0.0056115	0.008573655	-0.002962156
2	2012	-4%	-0.000458645	0.025502318	-0.025960964
3	2012	0%	0.013383298	-0.00075358	0.014136877
4	2012	0%	0.009282318	0.006033183	0.003249136
5	2012	1%	0.002617018	-0.002248876	0.004865894
6	2012	0%	-0.007681408	-0.010518407	0.002836999
7	2012	-1%	-0.008567564	-0.001518603	-0.007048961

8	2012	0%	-0.003107944	0.002281369	-0.005389313
9	2012	1%	0.002889514	0.005311077	-0.002421563
10	2012	1%	0.004321783	9.075471698	-9.071149915
11	2012	1%	0.006568021	0.002247191	0.00432083
12	2012	0%	0.006900173	-0.899850523	0.906750696
1	2013	1%	0.010204842	0.000746269	0.009458573
2	2013	1%	0.007152337	0.01043997	-0.003287633
3	2013	-2%	0.010030017	0.008118081	0.001911936
4	2013	-2%	0.009567991	0.007320644	0.002247347
5	2013	0%	0.001723148	0.009665698	-0.00794255
6	2013	2%	0.00050172	-0.000215936	0.000717656
7	2013	2%	0.002005874	0.005039597	-0.003033722
8	2013	1%	0.003002788	0.017908309	-0.014905521
9	2013	0%	0.014184903	0.002814919	0.011369984
10	2013	-2%	0.003303346	-0.007017544	0.010320889
11	2013	1%	0.002732049	0.000706714	0.002025335
12	2013	0%	0.004960179	-0.002118644	0.007078823
1	2014	0%	0.010775113	-0.000707714	0.011482827
2	2014	0%	0.003782669	0.005665722	-0.001883054
3	2014	0%	0.004522097	0.011971831	-0.007449734
4	2014	0%	0.010845099	-0.001391788	0.012236888
5	2014	1%	0.010121457	-0.002090592	0.01221205
6	2014	0%	0.001402806	-0.004888268	0.006291074
7	2014	0%	0.004602762	0.003508772	0.00109399
8	2014	0%	0.009428951	0.006993007	0.002435944
9	2014	1%	0.001447178	0.005555556	-0.004108378
10	2014	0%	-0.002101944	0	-0.002101944
11	2014	1%	-0.000460769	-0.001381215	0.000920447
12	2014	1%	0.004346394	-0.001383126	0.00572952
1	2015	1%	0.006032391	0.009695291	-0.0036629
2	2015	0%	0.004627517	0.004801097	-0.00017358
3	2015	0%	0.006487609	0.015699659	-0.00921205
4	2015	2%	0.022947016	0.012096774	0.010850241
5	2015	3%	0.008065532	-0.001328021	0.009393554
6	2015	1%	0.003000375	-0.003324468	0.006324843
7	2015	4%	0.000685529	0.008672448	-0.007986919
8	2015	1%	0.002055178	0.008597884	-0.006542705
9	2015	3%	0.002672467	0.013770492	-0.011098024
10	2015	-2%	0.00495878	0.009702458	-0.004743678

11	2015	-1%	0.015974835	0.003203075	0.01277176
12	2015	0%	0.00394609	0.002554278	0.001391812

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