Purchasing Power Parity Between Zambia and South Africa

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Abstract

This study tested the validity of the long-run purchasing power parity between Zambia and South Africa for the period 1997 to 2011. The study employed the following techniques unit root, cointegration, Granger-causality, impulse response and variance decomposition. The unit root tests showed that all relevant variables were integrated of order one. Cointegration test did support the existence of a long-run equilibrium relationship between the consumer price ratio and the nominal exchange rate for the two countries. The error correction model was constructed and the results provide evidence of some weak form of PPP holding in the long-run.

Keywords: Purchasing power parity, nominal exchange rate, consumer price index, Zambia and South Africa, unit-root, cointegration modelling

JEL Classification: E43
1. Introduction

In the long-run, the relative price behaviour of any two countries is the most powerful determinant of the exchange rate between their currencies (Kreinin, 2006). Purchasing power parity (PPP) is a condition that states that if international arbitrage is unhindered the price of a good or service in one nation should be the same as the exchange-rate-adjusted price of the same good or service in another nation (Daniels and Vanhoose, 2002). This means that the exchange rate between two countries should equal the ratio of two countries’ price levels of a fixed basket of goods and services. Carlsson, Lyhagen and Osterholm (2007) states that the basic idea behind the long-run purchasing power parity is that since any international goods market arbitrage should be traded away over time, it is expected that the real exchange rate will return to a steady equilibrium value in the long-run.

The theory further assumes that the actions of importers and exporter, motivated by cross country price differences induces changes in the spot exchange rate. In another vein, PPP suggests that transactions on a country’s current account affect the value of the exchange rate on the foreign exchange (Forex) market. This is in contrast with the interest rate parity theory, which assumes that the actions of investors (whose transactions are recorded on the capital account) induce changes in the exchange rate (Suranovic, 2010).

The general idea of PPP is that a unit of currency should be able to buy the same basket of goods in one currency as the equivalent amount of foreign currency at the going exchange rate so that there is parity in the purchasing power of the unit of currency across the two economies. Therefore, the basis for purchasing power parity is the “law of one price” which states that in competitive markets and in the absence of transaction costs and official barriers to trade, identical goods sold in different countries must sell for the same price when prices are expressed in terms of the same currency (Krugman and Obstfeld, 2003). However there is a difference between PPP and the law of one price. The law of one price applies to individual commodities while PPP applies to the general price level which is a composite of the prices of all the commodities that enter into the reference basket (Krugman and Obstfeld, 2009).

In the theory of the law of one price, when the price of a good differed between two countries markets there is an incentive for profit making individuals to buy the good in the low price market and resell it in the high price market to make profits. If the law of one price leads to the equalization of the prices of a good between two markets then it seems reasonable to conclude that PPP, describing the equality of market baskets across counties should also hold, (Suranovic, 1999).

Purchasing power parity (PPP) theory therefore, predicts that a fall in a currency’s domestic purchasing power (as indicated by an increase in the domestic price level) will be
associated with a proportional currency depreciation in the foreign exchange market. Similarly, PPP predicts that an increase in the currency’s domestic purchasing power will be associated with a proportional currency appreciation. This means that the exchange rate must depreciate or appreciate to return to purchasing power parity. This is to say, a unit of the domestic currency (Zambian kwacha) should be able to buy the same basket of goods and services in one country (i.e. South Africa) as the equivalent amount of foreign currency, at the going exchange rate so that there is parity in the purchasing power of the unit of currency across the two economies.

In spite of its usefulness, the validity of the long-run purchasing power parity remains a controversy as stated in a number of studies. Few, if any studies have found evidence for the theory in the short-run; while the results on purchasing power parity in the long-run have been more varied. This has generated a lot of interest and it goes for Zambia, especially the trade relation between Zambia and South Africa. Furthermore, exchange rate is a price hence it affects the agent both at micro and macro level. Therefore this study ought to investigate the validity of purchasing power parity between the kwacha and the rand. The article is organized as follows: the next section presents a literature review. Section 3 discusses the methodology. The empirical analysis and results are presented in section 4. Section 5 concludes the study.

2. Literature Review

The theory of purchasing power parity is usually expressed by a long-run relationship between the nominal exchange rate and the relative price levels. The theory was first formalized in Spain during the sixteenth century and brought back into use by Gustav Cassel after the end of world war one to restore the world financial system after large-scale periods of inflation during and after the war (O’Brien, 2007).

Theory states that the exchange rate between two countries equals the ratio of the countries price levels. PPP thus asserts that all countries price levels are equal when measured in terms of the same currency (Krugman and Obsetfeld, 2003). There are two types of purchasing power parity theory- Absolute and Relative purchasing power parity. Absolute power parity postulates that the equilibrium exchange rate between two currencies is equal to the ratio of the price levels in the two countries.

$$\varepsilon = \frac{P}{P^*}$$

Where $\varepsilon$ is the equilibrium exchange rate, $P$ is the domestic price level and $P^*$ is the foreign price level. By contrast, relative purchasing power parity postulates that the percentage change in the exchange rate between currencies over any period equals the
difference between the percentage changes in national price levels (Krugman and Obsetfeld, 2009).

\[ \Delta \epsilon = \Delta P - \Delta P^* \]  

Ray (2012) states that the basic building block of PPP is known as “Law Of One Price” (LOP). The LOP demonstrates that in the absence of trade barriers, such as transportation costs, and tariff, competition will equalize the price of an identical and traded good across countries when prices are expressed in the same currency. PPP is the earliest and simplest version of exchange rate determination by looking on the relationship between prices (or inflation) in two countries. It is possible to specify the PPP theory into the following absolute model (restricted version):

\[ E_t = \alpha + \beta \left( \frac{P_t}{P_{t*}} \right) + \nu_t \]  

where \( E_t \) is nominal exchange rate (home currency / foreign currency), \( P_t \) and \( P_{t*} \) are price indexes in home country and foreign country, respectively. Equation 3 implies that PPP holds when the estimated coefficient of price ratio is equal to unity (\( \beta = 1 \)). The second version of PPP, unrestricted version can be obtained by log transform and rearrange equation 3 as follows.

\[ \ln E_t = \alpha + \beta_1 \ln P_t + \beta_2 \ln P_{t*} + V \]  

Where \( \ln E_t \) is the logarithm of the nominal exchange rate, defined as domestic price of foreign currency, \( \ln P_t \) is the logarithm of domestic prices, \( \ln P_{t*} \) the logarithm of foreign prices, \( \alpha, \beta_1 \) and \( \beta_2 \) are the parameters, and \( V \) is the error term. The restriction commonly imposed on the parameters are \( \alpha = 0, \beta_1 = 1 \) and \( \beta_2 = -1 \). Taking the first difference of the absolute PPP yields \( \Delta \ln E_t = \alpha + \Delta \beta_1 \ln P_t + \Delta \beta_2 \ln P_{t*} + V \), the relative PPP.

Merwe and Mollentze (2010), The absolute purchasing power parity has other important shortcomings namely:

- The price level of the two nations that are being compared could be based on different baskets of goods. This means that arbitrage can not take place.
- There are many non-traded goods included in the price index of counties that cannot be equated with international trade.
- theory disregards financial flows, which are far more important than current-account transactions.
• The theory does not take transactions costs, tariffs, or obstruction to the flow of goods into account.

However, a weakness of the relative purchasing power parity theory is that it does not take structural changes into considerations. Therefore, the validity of absolute purchasing power parity implies the validity of relative purchasing power parity theory, but not vice versa (Bundesbank, 2004). Literature also mentions weak and strong purchasing power parity. Weak PPP implies that price ratios move together over long periods; therefore, they are cointegrated. Weak PPP can be explained by transportation costs, measurement errors and differences in price indices that make cointegrating coefficient differ from unity. Nominal exchange rates and aggregate price ratios may move together over long periods, but the movements may not be directly proportional due to these factors (Pedroni, 2004).

Theoretical literature suggest that all countries price levels are equal when measured in terms of the same currency. In determining the validity of purchasing power parity, the results from several empirical studies have been mixed. Few, if any studies have found evidence for the theory in the short-run while the results on purchasing power parity in the long-run have been more varied.

The test results for PPP by Cooper (1994), and by Ramirez and Khan (1999) are encouraging and provide empirical evidence for purchasing power parity in the long-run. Cooper (1994) in his paper found evidence that PPP does not hold in the long-run for Australian, New Zealand, and Singaporean currencies. Cointegration test did not support the existence of a long-run equilibrium relationship between the consumer price ratio and nominal exchange rate vis-à-vis the US dollar for any of the three countries. While Ramirez and Khan (1999) testes the validity of purchasing power parity for five industrial countries using cointegration and error-correction model and showed that all relevant variables were integrated of order I(1). They found that the diagnostic tests showed that purchasing power parity holds in the long-run. There are further empirical findings for PPP, for example, Tshipinare (2005) does not find any evidence to support purchasing power parity in the long-run between the Botswana and South African CPI’s and exchange rate using the analysis of cointegration. An error correction model could not be constructed because the variables were not cointegrated.

Raut and Drine (2007) in their study on purchasing power parity for developing and developed countries stressed that according to the numerous reviews of literature on this subject this renewal interest for the PPP is essentially due to three factors: (1) the necessity to reinterpret the PPP theory, (2) the availability of long-run time series and (3) the development of panel data econometrics. They analyzed the purchasing power parity concept for a sample
of 80 developed and developing countries and found that strong PPP is verified for OECD countries and weak PPP for MENA counties but however, in Africa, Asian, Latin America and in CEE countries PPP did not seem relevant to characterize the long-run behavior of the real exchange rate.

A test of purchasing power parity using SADC real exchange rates provides evidence indicating that the purchasing power parity (PPP) puzzle is becoming less of a puzzle (Mokoena, 2008). He applied Augmented Dickey-fuller test, nonlinear tests of nonstationarity and Bayesian unit root tests to ten SADC countries. It is argued that nonlinear approaches to exchange rate adjustments are likely to provide a firmer basis for inference and stronger support for the purchasing power parity in the long-run.

Olayunbo (2011) tested the validity of purchasing power parity hypothesis for 16 sub Saharan African counties for the period of 1980 to 2005 using panel root test and found that real exchange rate among Sub-Saharan countries except for Ghana and Uganda where stationary, which is in favor of validity of purchasing power parity.

Tsai, Weng and Lin (2012) applied this ARDL test for threshold cointegration to test the validity of long-run PPP for three countries of Southern Africa (i.e, Botswana, South Africa, Swaziland) over the January 1970 to January 2011 and the empirical results indicate that PPP only holds true for South Africa.

Empirical study shows that the long-run purchasing power parity holds true in some countries and does not in other countries. The literature further shows evidence that the purchasing power parity puzzle is becoming less of a puzzle. Therefore, this study intends to test the long-run purchasing power parity position between Zambia and South Africa.

3. Methodology
3.1 Econometric Framework and Model Specification

In analyzing the data, the model used by Tshipinare (2005) will be adopted in this paper namely absolute PPP which is stated as:

$$ E = \frac{P}{P^*} $$ ...5

Where $E$ is the exchange rate, $P$ and $P*$ are domestic and foreign price indices, respectively. To account for the shortcomings of the absolute PPP an alternative referred to as relative PPP is often specified.

$$ \Delta E = \Delta P - \Delta P^* $$ ...6
Where $\Delta E$ is the percentage change in the exchange rate while $\Delta P$ and $\Delta P^*$ represents the rate of change in domestic and foreign price levels. However, the model used is the following PPP model in standard logarithmic form.

$$\ln EX_t = \beta_0 + \beta_1 \ln \left( \frac{P_t^*}{P_t} \right) + \epsilon_t \quad \ldots 7$$

Where $\ln EX_t$ is the logarithmic of the actual exchange rate (foreign currency to domestic currency – Zambian Kwacha being the domestic currency and the South Africa Rand is the foreign currency), and $P_t^*$ and $P_t$ are the foreign and domestic CPIs, respectively. For the purchasing power parity relationship to hold the coefficient $\beta_1$ should be equals to one ($\beta_1 = 1$).

The estimations in this study will be done under the Vector Autoregressive (VAR) framework. Vector autoregression model is one of the most successful, flexible and easy to use models for the analysis of multivariate time series. A VAR system can be expressed in the following form:

$$Z_t = A_1 Z_{t-1} + A_2 Z_{t-2} + \cdots + A_p Z_{t-p} + \epsilon_t \quad \ldots 8$$

Where $Z_t$ is a vector of endogenous variables of time $t$, $A_i (i = 1, \ldots, P)$ are coefficient vectors, $P$ is the number of lags included in the system, and $\epsilon_t$ is a vector of residuals. The standard linear, simultaneous equations model is a useful starting point for understanding the structural vector autoregression (VAR) approach. The dynamic relationship between endogenous and exogenous variables is modelled under the simultaneous system of equations. A vector representation of this system is:

$$AY_t = C(L)Y_{t-1} + DZ_t \quad \ldots 9$$

Where $Y_t$ is a vector of endogenous variables and $Z_t$ is a vector of exogenous variables. $A$, is a square matrix and its elements are the structural parameters on the contemporaneous endogenous variables. The matrix $D$ measures the contemporaneous response of endogenous variables to the exogenous variables. $C(L)$ is the $k$th degree matrix polynomial in the lag operator $L$:

$$C(L) = C_0 + C_1 L + C_2 L^2 + \cdots + C_k L^k$$

where the $C$ matrices are all square. Theory stresses that some exogenous variables are observable while others are not because all variables enter the model endogenously. The vector $Z$ is assumed to consist of unobservable variables, which are interpreted as disturbances to the structural equations and $Y_t$ and $Z_t$ are vectors with length equal to the number of structural equations in the model.
A reduced form for this system is

\[ Y_t = A^{-\tau} C(L) Y_{t-1} + A^{-\tau} D Z_t \] ...10

The commonly used assumptions are that shocks have either temporary or permanent effects though they are not as restrictive as they might appear. If \( Z_t \) equals \( \varepsilon_t \), a vector white noise, shocks have temporary effects. That is:

\[ Z_t = \varepsilon_t \] ...11

Alternatively can be modelled as a unit root process, that is:

\[ Z_t - Z_{t-1} = \varepsilon_t \] ...12

This implies that \( Z \) equals the sum of all the past and present realization of \( \varepsilon \). Hence shocks to \( Z \) are permanent. Under the assumption that shocks have only temporary effects, equation (10) can be written as:

\[ Y_t = \beta(L) Y_{t-1} + \varepsilon_t \] ...13

Where \( \beta(L) = A^{-\tau} C(L) \) and \( \varepsilon_t = A^{-\tau} D Z_t \), and under the assumption that shocks are permanent the VAR model can be obtained by applying the first difference operator \((\Delta = 1 - L)\) to equation (10) and inserting equation (12) results in the following expression:

\[ \Delta Y_t = \beta(L) \Delta Y_{t-1} + \varepsilon_t \] ...14

Because each variable is a function of lagged values of all the variables, the vector autoregression is, therefore, a general dynamic specification. This generality however comes at a cost. Because each equation has many lags of each variable the set of variables must not be too large. Otherwise, the model would exhaust the available data.

Prior to vector autoregressive estimations, various steps should be conducted first.

1. Testing for unit root and determine the order of integration for two variables by employing tests devised by Augmented Dickey - Fuller (ADF), Philips and Peron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS).
2. Testing for cointegration and if there is cointegration relationship among the variables can be re-parameterised as an Error-Correction Model (ECM) which will contain both short and long-run effects. The Johansen cointegration can be applied in this respect.
3. Granger- causality. That is if there is cointegration there should be Granger-causality in at least one direction.
4. Impulse response and variance decomposition
3.2 Data and Data Source

The study contains monthly time series data which was collected for the period 1997 to 2011. The data used in this paper is quantitative. This is because the three time series variables of interest which are the nominal exchange rate (EX) and the Zambian and South African consumer price indices (CPI’s) being analyze are in figures terms. Collection of data for the purpose of this study is from the central bank of Zambia data base and the South Africa Reserve Bank data base.

4. Empirical Analysis And Results

4.1 Unit Root Test

The integration order of the variables is investigated using the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests for unit roots. The results of the unit root test in levels and first difference are presented in table 1 below.

Table 1: Unit root tests: ADF and PP in levels and first difference

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model specification</th>
<th>ADF</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Levels</td>
<td>First Difference</td>
</tr>
<tr>
<td>EX</td>
<td>Intercept and trend</td>
<td>-2.26</td>
<td>-10.04**</td>
</tr>
<tr>
<td></td>
<td>Intercept</td>
<td>-2.02</td>
<td>-10.04**</td>
</tr>
<tr>
<td>P*/P</td>
<td>Intercept and trend</td>
<td>-2.25</td>
<td>-11.70**</td>
</tr>
<tr>
<td></td>
<td>Intercept</td>
<td>-1.86</td>
<td>-11.72**</td>
</tr>
</tbody>
</table>

*Source: Author’s compilation using Eviews*

*Notes: (a)** means the rejection of the null hypothesis at 5%

Table 1 shows the results of estimating the ADF and PP tests on the CPI (P*/P) and the nominal exchange rate (EX) in level form and first difference. Results suggest that the null hypothesis cannot be rejected at 5% level and the series were all non-stationary in level form. The variables were therefore differenced once and both the ADF and PP tests results show that all the series become stationary. Both the ADF and the PP statistics are greater than the critical values in absolute terms. After formulating the statistical properties of the time series, a VAR model was estimated and then test for stability. The stability condition determines at which level VAR will be estimated. If stable all the roots (dots) are in the circle and VAR is estimated at level form and if not stable not all the dots are in the circle and VAR is estimated in first difference. The convergence lag length suggested is two. The results for the lag length structure and roots of characteristic polynomial are presented in tables 2 and 3 respectively.
Table 2: Lag length Criteria for PPP

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-233.2087</td>
<td>NA</td>
<td>0.052825</td>
<td>2.734984</td>
<td>2.771583</td>
<td>2.749834</td>
</tr>
<tr>
<td>1</td>
<td>266.4456</td>
<td>981.8788</td>
<td>0.000166</td>
<td>-3.028438</td>
<td>-2.918641</td>
<td>-2.983890</td>
</tr>
<tr>
<td>2</td>
<td>278.3816</td>
<td>23.17798</td>
<td>0.000151*</td>
<td>-3.120716*</td>
<td>-2.937722*</td>
<td>-3.046471*</td>
</tr>
<tr>
<td>3</td>
<td>279.9187</td>
<td>2.949042</td>
<td>0.000156</td>
<td>-3.092078</td>
<td>-2.835886</td>
<td>-2.988134</td>
</tr>
<tr>
<td>4</td>
<td>280.7180</td>
<td>1.515087</td>
<td>0.000162</td>
<td>-3.054861</td>
<td>-2.725472</td>
<td>-2.921219</td>
</tr>
<tr>
<td>5</td>
<td>283.4818</td>
<td>5.173976</td>
<td>0.000164</td>
<td>-3.040486</td>
<td>-2.637899</td>
<td>-2.877146</td>
</tr>
<tr>
<td>6</td>
<td>290.7764</td>
<td>13.48649*</td>
<td>0.000158</td>
<td>-3.078795</td>
<td>-2.603011</td>
<td>-2.885757</td>
</tr>
</tbody>
</table>

Source: Author’s compilation using Eviews

Table 3: Roots of Characteristic Polynomial for PPP

<table>
<thead>
<tr>
<th>Root</th>
<th>Modulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.962475</td>
<td>0.962475</td>
</tr>
<tr>
<td>0.947029</td>
<td>0.947029</td>
</tr>
<tr>
<td>0.219490 - 0.081238i</td>
<td>0.234042</td>
</tr>
<tr>
<td>0.219490 + 0.081238i</td>
<td>0.234042</td>
</tr>
</tbody>
</table>

Source: Author’s compilation using Eviews

Figure 1: Inverse Roots of AR Characteristic Polynomial

Source: author’s compilation using Eviews

No roots lie outside the unit circle. Therefore, VAR satisfies the stability condition.

4.2 Testing for Cointegration

Table 4 below gives the Johansen test for cointegration results based on trace and maximum Eigen value test statistics. The test results among the price levels (P*/P) and the nominal exchange rate (EX) for both the trace and eigen values show that at most 1, there are cointegrating vectors present because the test statistics are greater than the critical values. Therefore, the null hypothesis of no cointegration of variables is rejected at 5% critical value.
The presence of a cointegrating equation among variables results in estimating the Vector Error Correction Model (VECM), which is a Restricted VAR form for the simulated data.

Table 4: Johansen cointegration Test Based on Maximum Eigen Value and Trace for the Stochastic Matrix for PPP

<table>
<thead>
<tr>
<th>Maximum Eigen Test</th>
<th>Trace Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_o$ rank = r</td>
<td>$H_o$ rank = r</td>
</tr>
<tr>
<td>$H_o$ rank = r</td>
<td>$H_o$ rank = r</td>
</tr>
<tr>
<td>Statistic</td>
<td>95% critical value</td>
</tr>
<tr>
<td>r = 0</td>
<td>r = 1</td>
</tr>
<tr>
<td>r ≤ 1</td>
<td>r = 2</td>
</tr>
</tbody>
</table>

Source: Author’s compilation using Eviews

4.3 Granger Causality Test

Table 5: Granger Causality tests for PPP

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Dependent Variable in Regression</th>
<th>EX</th>
<th>P*/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX</td>
<td>0.00</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>P*/P</td>
<td>0.71</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author’s compilation using Eviews

Table 5 presents the Granger causality results of the two countries price ratio and nominal Exchange rate. The results suggests that the P-values are greater the 5% level of significant hence accepting the null hypothesis. Therefore, the exchange rate does not granger cause the price ratio (CPI) and also CPI does not granger cause the exchange rate. This suggests a no directional causal relationship among the variables (exchange rate and CPI’s) from either side. In other words there is no deviation by variables as it was indicated by the cointegration test.

4.4 Impulse Response Function

An IRF traces the effects of a one-time shock to one of the innovations on current and future values of the endogenous variables. Hence, the total effects (temporary and permanent) that these variables have on each other are of great interest. Figure 2 below presents the response of the nominal exchange rate to innovations in the ratio of the two countries price levels and the response of the price levels to the innovations in the nominal exchange rate, with time horizon (period) on the horizontal axis and response on the vertical axis. There is a temporary (transitory) effect on nominal exchange rate for the first 3 months. After 3 months, however, there is a convergence towards the steady state (equilibrium or base line) which is slightly above the base line. These effects remained permanent or constant even after the first 24 months. The IRF also shows that the foreign consumer price level decreases due to the appreciation of the nominal exchange rate. The temporary effects vanished after 4 months while the permanent effects remained persistently moving towards the base line even after 24
months. This shows the presence of what could be called a weak form of PPP holding as shown by the response of the nominal exchange rate to changes in the price ratio.

Figure 2: Impulse responses of purchasing power parity

Source: Author’s compilation using Eviews

4.5 Forecast Error Variance Decomposition

Table 6 presents the forecast error variance decomposition for each of the two variables in the model over a 24-months forecast time horizon. Table 6 shows that during the first month fluctuations in the exchange rate were caused by itself. After 24 months it is seen that 0.203 per cent of the fluctuations in the exchange rate were caused by the price levels (CPI’s) and 99.797 per cent by itself. In comparing the two, it shows that the fluctuations in the exchange rate are dominated by itself. The errors in the price levels are also dominated by itself that is fluctuations in the first month were 99.100 per cent caused by price levels and 4.67 per cent by the exchange rate. Even after the 24 months period, the errors in the forecast of the price level are still dominated by itself.

Table 6: Variance Decomposition for PPP

<table>
<thead>
<tr>
<th>Month</th>
<th>EX</th>
<th>P*/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td>99.761</td>
<td>0.239</td>
</tr>
<tr>
<td>12</td>
<td>99.759</td>
<td>0.241</td>
</tr>
<tr>
<td>18</td>
<td>99.778</td>
<td>0.222</td>
</tr>
<tr>
<td>24</td>
<td>99.797</td>
<td>0.203</td>
</tr>
<tr>
<td>Month</td>
<td>EX</td>
<td>P*/P</td>
</tr>
<tr>
<td>-------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>4.67</td>
<td>99.100</td>
</tr>
<tr>
<td>6</td>
<td>5.759</td>
<td>94.241</td>
</tr>
<tr>
<td>12</td>
<td>6.735</td>
<td>93.265</td>
</tr>
<tr>
<td>18</td>
<td>6.969</td>
<td>93.031</td>
</tr>
<tr>
<td>24</td>
<td>7.035</td>
<td>92.963</td>
</tr>
</tbody>
</table>

Source: Author’s compilation using Eviews

5. Conclusion

This study tested the theory of the long-run purchasing power parity between Zambia and South Africa using cointegration modelling. The study used the ADF and PP tests and showed that all relevant variables were integrated of order I(1). Cointegration tests did support the existence of a long-run equilibrium relation between the consumer price ratio and the nominal exchange rate for the two countries, that is the null hypothesis of no cointegration could be rejected and an error correction model was constructed because the variables were cointegrated- have a stable long run relationship. The results are very encouraging and provide evidence of some weak form of PPP holding in the long-run. Since the exchange rate reflect transaction values for traded goods between Zambia and South Africa, the presence of a weak form PPP between the Zambian kwacha and the South African rand is due to differences in the transportation costs and governmental trade restrictions which makes it expensive to move goods between markets located in the two countries. As transportation costs increases, the higher the range of exchange rate fluctuations. The result of this study is relevant to the Zambian policy makers who desire to understand trade relations between the Zambian kwacha and other currencies. Thus, the regulatory authorities should do all they can to stabilize (minimize) transaction costs and trade restrictions e.g. to introduce a uniform tariff. This enhances trade harmonisation between the two countries and there will be minimal trade impediments which will result in stronger purchasing power parity basis. If strong PPP holds true it means more trade between Zambia and South Africa and stable transaction costs and governmental trade regulations.

References


