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An Empirical Assessment of the Real Exchange Rate and Poverty in Nigeria

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Abstract

This paper investigated the influence of the real exchange rate on poverty within the framework of a dependent economy model. Using data covering 1980 to 2010, the result of a Vector Error Correction model (VECM) showed that the volatility of the real exchange rate has significant influence on the level of poverty in Nigeria. Thus, government policies that targets real exchange rate could play significant role in reducing the level of poverty in Nigeria, particularly if supported by basic institutions, such as those of human capital development.

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Introduction

The increased awareness of the need to tackle poverty in Nigeria has directed attention towards the role of macroeconomic policy in achieving social as well as macroeconomic objectives. The preservation of macroeconomic stability is important not as an end in itself, but a necessary precondition for sustained economic growth which is the single most important factor influencing poverty reduction (Greg, 2006).

Macroeconomic policies are those that directly or indirectly impact on key variables such as the real exchange rate (RER), inflation rate, current account balance, fiscal deficit and the level of international reserves. Over the years, frequent exogenous shocks, including volatility of terms of trade and resource flows as well as capricious weather conditions have taken a heavy toll on the internal and external balances of many developing countries and as a result some of these counties, particularly those in Africa adopted Structural Adjustment Programmes (Oumar, 2007).

In Nigeria, the Structural Adjustment Programme (SAP) was adopted in 1986. Changes in the exchange rate change the relative price of goods in two countries. However, the nominal exchange rate is not the only variable that affects the relative price of goods in two countries. The price levels in each country matter as well. This is why the RER defined as:

$$q = \frac{eP^*}{p} = \frac{\$\text{ Price of foreign goods}}{\$\text{ price of domestic goods}},$$

is used to compare prices in two countries, where q is the RER, while P* and P represent prices of foreign and domestic goods respectively, and e is the nominal exchange rate. Thus, an increase in q is known as a depreciation of the RER (foreign goods become more expensive) and a decrease in q is an appreciation of the RER (foreign goods become cheaper). However, nominal exchange rate appreciation can cause RER appreciation, all things remaining equal; also changes in prices can cause the RER to fluctuate without changes in the nominal exchange rate. In the dependant economy model, clearing internal and external imbalances requires an increase of the RER which implies depreciation and a reduction in domestic absorption. Policies aimed at reducing fiscal deficits and privatizing state owned enterprises are therefore supposed to contain domestic absorption, while measures gearing towards promoting trade, such as slashing of tariff on exports are expected to depreciate the RER.

In Nigeria, the real purchasing power of household incomes has been reduced due to the worsening economic situation compounded by the complete removal of kerosene and diesel subsidies and the partial removal of subsidies on petroleum motor spirit (PMS) without basic infrastructures. Although depreciation of the RER is expected to enhance export competitiveness and raise the local currency income of exporters, this is not necessarily so because of the high cost of imported inputs and consumables as well as the high cost of infrastructures. The increased cost of imported inputs (medicines, machines, books, raw materials, laboratory equipment, etc.) may have worsened the poverty level in Nigeria. Thus, the changes in the RER have a price raising effects which has been detrimental to the Nigerian economy.

The worsening state of poverty in Nigeria has been attributed to various factors which include, amongst others: poor and inconsistent macroeconomic policies, weak diversification of the productive base, gross economic mismanagement, weak inter-sectoral linkages, persistence of structural bottlenecks in the economy, high import dependence and heavy reliance on crude oil exports (Greg, 2006). Others include unemployment, inadequate access to assets such as land and capital by the poor, inadequate access to markets due to bad road and communication networks, low level of human capital development and paucity of health and sanitation facilities. These material and non-material deprivation has made poverty to be endemic in Nigeria. Data reveal that only 50% of Nigerians have access to clean water, while 38% cannot afford primary health care. The most worrisome is the decline in the Human Development Index for Nigeria from 0.400 in 1996 to 0.39 in 1997, thus placing Nigeria in 137 out of 141 countries ranked in order of affluence. Nearly 50% of the total national income is owned by just about 20% of the highest income earning group (James, 2008).

The aim of this paper is thus to empirically investigate the influence of the RER on the level of poverty in Nigeria. The relevance of human capital development to this relationship will also be assessed. Although the relationship between real exchange rate and output has been well canvased, same cannot be said of the link between real exchange rate and poverty in Nigeria. This paper is an attempt to fill such gap. The paper will illuminate the links between real exchange rate and income on the one hand and between income and poverty on the other. It will also reveal the implications of continuous depreciation of the naira on poverty levels in the domestic economy.

Other than this introductory section, the rest of the paper is divided into three sections. The second section presents a review of empirical literature and theoretical framework. The third section is on the econometric procedure, while section four concludes.

A Note on the Empirical Literature and Theoretical Anchorage

Theoretical Framework

The inherent failure of traditional economic models (Keynesian and monetarian) to capture the reality of the developing world gave prominent role to the 'dependant' economy model which is adopted for this study. The dependant economy model provides the theoretical background for policies designed to reduce internal and external imbalances in developing countries, Nigeria inclusive. The dependant economy model was initially developed in the area of international trade theory (Salter, 1959, Swan, 1960) and subsequently found numerous applications in developing economies because of the ability to capture dynamics in small open economies, especially developing economies. The model is built on the assumption that the country is a price-taker, meaning that the country has no significant market power to influence world prices. Another salient feature of the model is the distinction made between tradable and non-tradable goods. The model assumed that the price of tradable goods is determined by the world market, the prevailing nominal exchange rate and trade policy, especially tariff and export subsidies, while non-tradable price depends on the domestic effective demand and domestic supply. The model could be summarized by the following equations:

$$Qt = e{*}Q{*}t \ {*} \ (1 + h) \qquad \text{…………1}$$

$$Q = Q(Qt, Qn) \qquad \text{……..2}$$

$$E = \frac{Qt}{Qn} \qquad \text{…………..3}$$

$$EDn = Nd\ (E,G) - Ns\ (E) \qquad \text{……..4}$$

$$EDt = Td\ (E, G) - Ts\ (E) \qquad \text{……5}$$

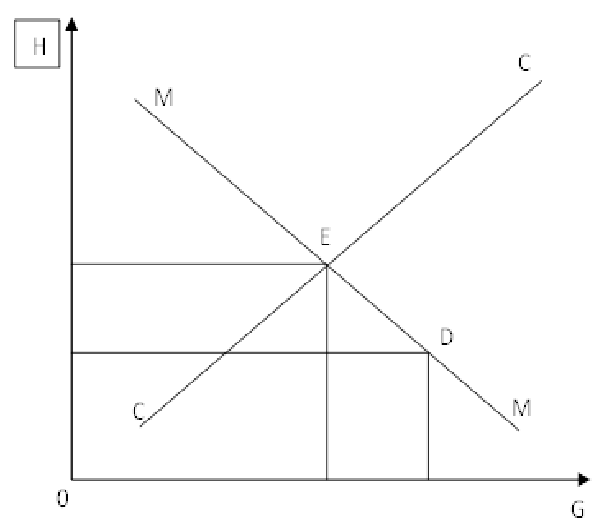
$\frac{\partial EDn}{dE} < 0$ $\frac{\partial EDn}{dG} < 0$; $\frac{\partial EDt}{dE} > 0$; $\frac{\partial EDt}{dG} > 0$………6

Equation 1 indicates the determinants of tradable prices, Qt, which are the nominal exchange rate, e, the international price of tradable goods, Q*t, and the trade policy represented by a tariff, h. Equation 2 captures the general level of prices, which is assumed to be a linearly homogenous function of the prices of tradables, Dt, and non-tradables, Qn. Equation 3 defines the RER, E, as the relative price of non-tradables to tradables. Equation 4 and 5 represent excess demand of non-tradable and tradable goods. These equations also carry two public policy variables; the public spending, G, and the RER, E. Equation 4 indicates that any appreciation of the RER results in the decline of the excess demand of tradables as they become relatively expensive. On the other hand, an increase in public spending leads to higher excess demand for non-tradables. Equation 5 shows that an appreciation of RER, by both boosting the demand and restricting the supply of tradables, increases the excess demand of this particular good. The same equation suggests that an increase in government expenditures or an augmentation in absorption widens the excess demand of tradable goods.

Equations 4 and 5 can be used to illustrate the conditions for internal and external balance, which requires excess demands for non-tradables and tradables to equal zero. In this regard, (E, G) which represents internal equilibrium, is represented by a curve with negative slope, (MM). This highlights the idea that a RER appreciation is key in restoring equilibrium in the non-tradable market when public spending goes up. In other words, a rise in absorption, which is the same as an increase in public expenditure, triggers an excess in the demand of non-tradables. The relative price of non-tradable has to go up for the imbalance to be eradicated, implying that the RER has to appreciate. The external equilibrium is represented by an increasing curve (CC), implying that if public expenditure increases (so does the absorption), relative price of tradable must rise in order to eliminate the external imbalance. The simultaneous internal and external equilibriums are represented in point at E in Figure 1:

The point D represents a condition where there is an external imbalance, such as a trade deficit. D can also be described as a situation where the RER is below the equilibrium level, or overvalued. This is indicative of the conditions that prevailed in many African countries after the second oil shock (Oumar, 2007). One way of clearing this external imbalance, moving from D to E, consists in both reducing the absorption and depreciating the relative price of tradables to non-tradables. Economic policies are therefore designed to achieve these two objectives and such policies are usually qualified as good economic policies. These policies include prudent fiscal, monetary and exchange rate policies with the focus of avoiding the overvaluation and excessive absorption. Obviously, economic policies in the dependant economy model's framework tend to primarily impact on the RER and absorption. As a result, analyzing the impact of sound economic policies on poverty, amounts to assessing the impact of RER and absorption on poverty.

Figure 1: Dynamics in a dependent economy model



Empirical Literature

In the empirical literature investigating the relationship between RER and poverty are linked with the level of output. In this regard Modey (1992) analyzed the effect of RER on output for 28 devaluing countries using a regression framework. After the introduction of controls, he found that depreciation of RER induce changes in output. Rodriguez and Diaz (1995) estimated a six variable VAR-output, growth, real wage growth, exchange rate depreciation, inflation, money supply and the Solow residuals in an attempt to decompose the movements of Peruvian output. They observed that output growth could mainly be explained by "own" shocks but was negatively affected by increases in exchange rate depreciation as well. Rogers and Wang (1995) obtained similar results for Mexico. Using a 5-variable VAR model-output, government spending, inflation, RER and money growth-they found that most variations in the Mexican output resulted from "own" shocks. They however added that exchange rate depreciation led to a decline in output.

Kamin and Khan (1998) used error correction mechanism in assessing the link between output and the RER for a group of 27 countries. Their result showed that devaluation is not contractionary in the long term. After controlling for spurious correlation, reverse causality appeared to alternate the measured contractionary effect of devaluation in the short term, although the effect persisted even after the introduction of controls.

Antonopoulos (1999) tested the so-called "Shaikh hypothesis", which states that the RER is fundamentally determined by the ratio of relative real unit labour costs (as a proxy for productivity differentials) of tradable goods between two countries. However, Antonopoulos's model added capital flows to the "Shaikh hypothesis" and employed cointegration methodology on Greece's data covering the period 1960-1990. The study provided evidence that RER movements cannot be explained by the PPP hypothesis, that there was a strong role of the productivity of the export sector of Greece *vis-à-vis* that of the rest of the world, and that there is a less important role of net capital inflows. The evidence in this study suggested that an improvement in the relative productivity of Greece's export sector and in capital inflows appreciated the country's RER.

Ubok-Udom (1999) highlighted the contentious issue that surrounded the implementation of the SAP stating that the peculiar features of the Nigerian economy would lessen the efficacy of currency depreciation in producing desirable effects. He examined the relationship between exchange rate dynamics (and currency depreciation) and the growth of domestic output in the Nigerian economy over a 25 year period (1971-1995). He expressed the growth of domestic outputs (total GDP, non-oil GDP and oil-GDP) as a linear function of variations in the average nominal exchange rate, while a dummy variable was used to capture the period of currency depreciation and a time variable which may reflect the influence of any time trend effect on output growth. This equation was estimated using the naira valued output respectively. The empirical results of this study showed that all the coefficients of the major explanatory variables have negative signs in all the estimated equations. He explained this result by stating that the rate of growth of total and non-oil GDPs tend to decline or rise with a fall or a rise in the nominal naira / US dollar exchange rate. Further, the results revealed that the coefficients of these major explanatory variables in the equations estimated with the naira-valued GDP were statistically insignificant. Moreover, it was shown that in the dollar-valued GDP, the coefficients of the major explanatory variables were statistically significant at 5.0 and 10.0 percent levels and that they have negative signs as stated earlier. He concluded that the results were generally in contrast with the theoretical expectations that currency depreciation promotes domestic output growth. He also stressed the need for further investigation so as to be sure of the exact relationship between devaluation or currency depreciation and GDP growth in Nigeria.

Ogun (2004) examined the impact of RER on growth of non-oil export in Nigeria. Specifically, he analyzed the effects of real exchange rate misalignment and volatility on the growth of non oil exports. He employed the standard trade theory model of determinants of export growth and two different measures of real exchange rate misalignment, one of which entailed deviations of purchasing power parity (PPP) and the other was model based estimation of equilibrium RER. He reported that, irrespective of the alternative measures of misalignment adopted, both RER misalignment and volatility adversely affected growth of Nigeria's non-oil export.

Kempa (2005) identified two distinct sources driving exchange rates: one arising in financial markets and the other in the real economy. Nominal shocks were measured as changes in money supply and money demand and aggregate supply shocks were measured by a series on industrial production, while the rate of domestic absorption and elasticity of the current account were used as proxies for aggregate demand shocks. The decomposition suggested that nominal shocks accounted for less than 33 per cent of overall RER variability, aggregate supply shocks explained less than 10 per cent of overall variability and the remaining variability were accounted for by aggregate demand shocks, particularly at longer forecast horizons. Thus, the evidence in this study suggested that exchange rate fluctuations appeared to be predominantly equilibrium responses to real shocks, rather than volatility in financial markets.

Oumar, (2007) assessed the relationship between the RER and poverty in a group of countries using panel data and the System General Method of Moments. He found that the RER depreciation favoured the poor, provided that income is fairly distributed and institutions are sound.

Akpan and Udoma (2008) investigated exchange rate policies and economic growth in Nigeria using annual time series data covering 1970 to 2006. They found no strong evidence of a significant relationship between exchange rate and gross domestic product (GDP). Rather, Nigerian economic growth has been influenced more by fiscal and monetary policies and other economic variables like export.

From the short review of literature undertaken here, we found that most of the studies focused on Latin America and other developed countries. Only few studies had been conducted on the issue in Sub-Sahara Africa, particularly Nigeria. The idea of reverting to intermediate policy indicators in this paper rather than final policy outcomes has two advantages. First it makes the model specification less cumbersome as the analysis relies on fewer factors. Second, the method helps to effectively address model uncertainty concerns and the parsimonious choice of explanatory variables because the approach is based on a theoretical model (Oumar, 2007). The relationship between the intermediate policy variables and poverty come to play through direct and indirect channels. Thus, in line with vast empirical literature on poverty reduction, economic growth is considered as the major indirect channel through which economic policies, RER and absorption in this paper influence poverty. Direct channels were also highlighted.

Econometric Procedure

The Vector Error Correction Model (VECM) was used for the analysis because it restricts the long run behaviour of the endogeneous variables to converge to their cointegrating relationships while allowing for a short run adjustment (Gujaratti, 2003). The VECM is of the form:

$$\Delta y_t = \alpha\beta' y_{t-1} + \sum_{i=1}^{j=1} \Gamma_j \Delta y_{t-1} + \pi + \varsigma_t, t = 1, \dots, T$$

Where y_t is a vector of endogenous variables which include exchange rate, domestic price, interest rate and money supply. The α parameters measures the speed of adjustment through which the variables adjust to their long run values and the β' vectors are estimates of the long run cointegrating relationships among variables in the model. π is the drift parameter and is the matrix of the parameters associated with the exogenous variables. The stochastic error term is also included in the specification.

The model to be estimated has poverty, measured by per capita income as the left hand variable, while the Real Effective Exchange Rate (REER), absorption (represented by government spending) and human capital development represented by primary school enrolment are the right hand variables. The model could be linearly stated as:

$$LPCY = C_0 + C_1REER + C_2GSP + C_3PE + U_t$$

Where:

PCY = Poverty, measured by per capita income

REER = Real Effective Exchange Rate

GSP = Absorption represented by government spending

PE = Human capital development represented by primary school enrolment

L = Natural logarithm

Ut = Random variable

The first step in the analysis was to estimate the descriptive statistic. The result of the descriptive statistic is presented in table-1. The skewness which measures the asymmetry of the distribution of the series around its mean has values greater than zero which indicates that the series is skewed to the right. This insinuates that the distribution has a long right tail. The kurtosis measures the peakedness or flatness of the distribution with an expected value of 3.0. The result in table 1 suggests that the human capital development and the REER satisfy the condition. However, that of poverty is leptokurtic (greater than 3), while that of absorption is platykurtic (less than 3). The Jarque-bera test is used to test whether the random variables with unknown means and dispersion are normally distributed. It measures the difference between skewness and kurtosis. The Jarque-bera test has the null hypothesis of normally distributed residuals. The probability values indicate a validation of the null hypothesis that the errors are normally distributed.

The Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) unit root tests were used to test whether the series is stationary and their order of integration. The results of both the ADF and PP tests are shown in table 2.

Table -1 Descriptive Statistic

	LPCY	LGSP	LPE	LREER
Mean	5.548058	12.09556	15.45704	4.919301
Median	5.598422	12.42428	15.20979	4.655388
Maximum	6.659294	15.43041	18.74115	6.428622
Minimum	2.484907	9.118104	14.17566	4.051263
Std. Dev.	0.815082	2.163242	1.065264	0.672823
Skewness	2.582394	2.042719	0.940633	1.952515
Kurtosis	7.512071	1.499202	3.802939	2.645543
Jarque-Bera	0.123395	2.918772	1.404169	4.849926
Probability	0.610322	0.232379	0.707066	0.088481
Sum	171.9898	374.9624	479.1684	152.4983
Sum Sq. Dev.	19.93077	140.3884	34.04364	13.58071
Observations	31	31	31	31

Table-2 Summary of ADF and PP Unit Root Tests Results

Variables	**ADF**			**PP**		
	Level	**1st Difference**	**Order of Integration**	**Level**	**1st Difference**	**Order of integration**
REER	-2.512380	-4.452675*	I(1)	-1.718632	-3.731692*	I(1)
PE	-3.008101**	-6.071994	1(0)	-3.112086**	-11.74115	I(0)
PCY	-2.170383	-2.994388**	I(1)	-1.475572	-3.147922**	I(1)
GSP	2.588982	3.024763**	I(1)	1.983226	3.491276**	1(1)

NB: * & ** Indicate statistical significance at the 1% & 5% levels respectively

Table-3 Summary of Johansen Cointegration Test

Hypothesized No. of CE(s)	**Eigen Value**	**Trace Statistic**	**5% CV**	**1% CV**	**Max-Eigen Statistic**	**5% CV**	**1%CV**
None**	0.818194	74.64199	47.21	54.46	49.43959	27.07	32.24
At most 1	0.353649	25.20240	29.68	35.65	12.5596	20.97	25.52
At most2	0.292228	12.54644	15.41	20.04	10.02337	14.07	18.63
At most3	0.083325	2.523074	3.76	6.65	2.523075	3.76	6.65

Both trace and max-eigen statistics tests indicate 1 cointegrating equation at both the 5% and 1 % level

The ADF and PP unit root test results in table 2 shows that all the variables except human capital development were I(1). Human capital development was I(0). Following Gujarrati (2003) and Harris (1995) both I(1) and I(0) variables can be tested for cointegration. We thus proceed to test for cointegration using the Johansen methodology. The summary of the Johansen cointegration test is presented in table 3 below:

The results from table 3 insinuate the existence of a long run equilibrium relationship among poverty, human capital development, absorption and the

REER. Under this condition, favouring a VAR in level or first difference as opposed to VECM could lead to misspecification because cointegration is established. The number of cointegrating relationship and the number of lags provided a guide for the specification of the VECM. The first step is the identification of the cointegrating relationships that have been suggested in the last section. Table 4 presents the results from the VECM.

Table-4 Summary of Vector Error Correction Result

Vector Error Correction Estimates
Date: 02/04/12 Time: 10:52
Sample(adjusted): 1983 2010
Included observations: 28 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1			
LPCY(-1)	1.000000			
LGSP(-1)	0.453401			
	(0.09449)			
	[4.79830]			
LPE(-1)	0.494609			
	(0.20049)			
	[2.46694]			
LREER(-1)	1.296603			
	(0.19432)			
	[6.67267]			
C	-25.11304			
Error Correction:	**D(LPCY)**	**D(LGSP)**	**D(LPE)**	**D(LREER)**
CointEq1	-0.195344	-0.210107	0.217518	-0.265590
	(0.06008)	(0.26337)	(0.25801)	(0.11663)
	[-3.25144]	[-0.79776]	[0.84306]	[-2.27725]
D(LPCY(-1))	-0.012228	-0.364998	0.652676	-0.051036
	(0.09514)	(0.41706)	(0.40857)	(0.18468)
	[-0.12853]	[-0.87517]	[1.59746]	[-0.27634]
D(LPCY(-2))	0.006877	-0.092466	0.765375	-0.025394
	(0.06592)	(0.28898)	(0.28309)	(0.12797)
	[0.10432]	[-0.31998]	[2.70361]	[-0.19845]
D(LGSP(-1))	0.083340	-0.470924	-0.077179	-0.025050
	(0.05415)	(0.23738)	(0.23255)	(0.10512)
	[1.53907]	[-1.98383]	[-0.33189]	[-0.23831]
D(LGSP(-2))	0.033038	-0.133878	0.025509	0.106885
	(0.05347)	(0.23440)	(0.22963)	(0.10380)
	[0.61788]	[-0.57114]	[0.11108]	[1.02973]
D(LPE(-1))	0.065458	0.132162	-0.448380	0.229635
	(0.05380)	(0.23584)	(0.23104)	(0.10443)
	[1.21673]	[0.56039]	[-1.94072]	[2.19883]
D(LPE(-2))	0.075707	0.319125	-0.137672	0.167673

	(0.05101)	(0.22364)	(0.21908)	(0.09903)
	[1.48401]	[1.42697]	[-0.62840]	[1.69313]
D(LREER(-1))	0.032316	0.352843	0.045222	0.377782
	(0.11315)	(0.49601)	(0.48591)	(0.21965)
	[0.28561]	[0.71136]	[0.09307]	[1.71997]
D(LREER(-2))	0.156104	0.107385	-0.229550	0.135178
	(0.11684)	(0.51220)	(0.50178)	(0.22682)
	[1.33604]	[0.20965]	[-0.45748]	[0.59598]
C	0.013037	0.423674	-0.187981	0.005230
	(0.03792)	(0.16624)	(0.16286)	(0.07362)
	[0.34377]	[2.54850]	[-1.15425]	[0.07105]
R-squared	0.427979	0.379216	0.411694	0.424749
Adj. R-squared	0.141969	0.068823	0.117541	0.137124
Sum sq. resids	0.466295	8.960981	8.599844	1.757176
S.E. equation	0.160951	0.705572	0.691208	0.312443
F-statistic	1.496378	1.221731	1.399592	1.476743
Log likelihood	17.60169	-23.77973	-23.20383	-0.971326
Akaike AIC	-0.542978	2.412838	2.371702	0.783666
Schwarz SC	-0.067191	2.888625	2.847490	1.259453
Mean dependent	0.019986	0.215863	-0.067232	-0.026328
S.D. dependent	0.173757	0.731182	0.735803	0.336354
Determinant Residual Covariance		0.000205		
Log Likelihood		-15.25060		
Log Likelihood (d.f. adjusted)		-39.99324		
Akaike Information Criteria		5.999517		
Schwarz Criteria		8.092981		

A comparative assessment of the error correction term (coint eq1) at the bottom of table 4 for the first vector shows that poverty has a t- value of -3.25144 with the right negative sign. The other variables except the REER either have a wrong sign or are not significant. This suggests that the poverty equation constitutes a cointegrating relationship in the first vector. The REER is also significant with a t-value of -2.27725 and coefficient of -0.265390. The results thus suggest that about 20 percent of the disequilibrium in poverty is corrected each year, while about 27 percent of the disequilibrium in the REER is corrected yearly. The error correction term for absorption has the right sign and falls within the acceptance region of -1<error term<0 but it is not statistically significant, while that of human capital development measured by primary school enrolment is statistically flawed. The result thus shows how poverty responds to variations in the REER as well as absorption and human capital development.

The next step in the empirical results is on the variance decomposition which shows the percentage of variance explained by the shock from the variable itself and the shocks from the other variables in the model. The results of the variance decomposition are shown in tables 5 to 8.

A Proper assessment of the result of the variance decomposition reveals that majority of the variances in the variables have been as a result of their ‘own’ shocks. However, human capital development, REER and poverty had significant impact on the variances of the other variables through the share of their shocks to these variables. For example, the share of per capita income to variances in other variables which explain the impact of poverty has been highly significant during the study period. Apart from ‘own’ shock which was as high as 100 percent in the first period, the contribution of poverty to variances in REER was as high as 42 percent in the first period and increased to 48 percent in the 5^{th} period before declining to about 42 percent in the last period. The share of poverty to the variances in human capital development is also significant. It was about 29 percent in the first period but declined to about 12percent in the last period. The contribution of poverty to absorption was however not significant hovering between 2 to 4 percent. Following the variance decomposition of REER, shocks in poverty explained almost equal variance to the REER as REER contribution to shocks in itself. The contribution of REER to shocks in poverty was also significant. It increased from about 4 percent in the second period to about 13 percent in the last period. Other than the significant contribution of human capital to shocks in itself, which is about 85 percent in the last period? The contribution of human capital development to variances in poverty increased from about 2 percent in the second period to about 18 percent in the last period. The contribution of human capital development to variances in REER was about 4 percent in the first period and increased to about 9 percent in the 9th period. The contribution of absorption to variances in all the variables and that from all the variables to absorption is insignificant. Thus, the volatility of the REER has significant effect on the level of poverty in Nigeria. The implication of the result is that government policies which targets RER could play significant role in reducing the level of poverty in Nigeria.

Table-5 Variance decomposition of LPCY

Period	S.E.	LPCY	LGSP	LPE	LREER
1	0.160951	100.0000	0.000000	0.000000	0.000000
2	0.251153	94.62923	0.206525	1.518983	3.645263
3	0.325546	90.70838	0.123980	3.253821	5.913817
4	0.437775	81.97619	0.543469	8.821594	8.658745
5	0.553931	76.35704	0.374786	12.40398	10.86420
6	0.663635	72.38024	0.347826	15.41558	11.85635
7	0.752883	70.39491	0.321492	16.87222	12.41138
8	0.825491	69.40638	0.297627	17.72594	12.57005
9	0.883762	69.07216	0.279501	18.06218	12.58616
10	0.932225	69.04442	0.265495	18.14524	12.54484

Table 6: Variance Decomposition of LGSP

Period	S.E.	LPCY	LGSP	LPE	LREER
1	0.705572	0.105902	99.89410	0.000000	0.000000
2	0.775518	2.076752	97.79874	0.073871	0.050636
3	0.887526	4.436219	92.90897	2.615676	0.039130
4	0.971733	3.716829	93.90674	2.306864	0.069569
5	1.053011	3.177762	94.57545	1.978680	0.268107
6	1.122780	2.911113	95.01500	1.741789	0.332100
7	1.186474	2.620359	95.42071	1.564901	0.394030
8	1.251674	2.384450	95.76605	1.406115	0.443384
9	1.311948	2.229655	96.03599	1.281929	0.452423
10	1.369343	2.113862	96.24977	1.184780	0.451588

Table 7: Variance Decomposition of LPE:

Period	S.E.	LPCY	LGSP	LPE	LREER
1	0.691208	28.64643	0.794008	70.55956	0.000000
2	0.820974	24.58177	0.701010	73.96894	0.748285
3	0.941116	19.64720	1.480585	78.26106	0.611157
4	1.072284	17.77463	1.901708	79.77677	0.546885
5	1.163807	16.37995	1.719913	81.41084	0.489293
6	1.234988	15.04856	1.780358	82.71180	0.459280
7	1.291745	14.03074	1.851201	83.62676	0.491304
8	1.342889	13.19754	1.858960	84.39030	0.553206
9	1.391837	12.49071	1.898150	85.01032	0.600819
10	1.440387	11.89225	1.933328	85.55673	0.617694

Table 8: Variance Decomposition of LREER:

Period	S.E.	LPCY	LGSP	LPE	LREER
1	0.312443	42.21212	6.077503	3.470507	48.23987
2	0.531918	46.46659	13.06131	6.052919	34.41918
3	0.659095	49.64020	11.74371	7.106961	31.50913
4	0.716959	48.44019	15.11831	6.007952	30.43354
5	0.750803	47.61107	17.64410	5.673202	29.07163
6	0.782706	45.59788	20.34874	6.588101	27.46528
7	0.812837	43.69992	22.65136	7.657076	25.99165
8	0.842597	42.43160	24.33542	8.362657	24.87033
9	0.873596	41.73168	25.64508	8.506780	24.11646
10	0.905987	41.56488	26.52207	8.243623	23.66942
Cholesky Ordering: LPCY LGSP LPE LREER					

The result of the parsimonious Error Correction Model shown in the appendix had similar findings. The result showed that the coefficient of the REER is statistically significant and displays a positive sign which indicates that a RER depreciation is potentially beneficial to the poor. Our result also showed that human capital development proxied by primary school enrolment has a positive and significant impact on poverty. This is an indication that the quality of human capital development has the tendency of enhancing the positive impact of an appropriate RER policy on poverty alleviation. This result is in agreement with Oumar (2007) who found in his study on poverty and RER in some selected countries using panel data and the System General Method of Moments estimator that both secondary and primary school enrolments are positively and significantly related to the income of the poorest fifth of the population in some selected countries. The statistical insignificance of absorption does not mean a complete absence of a relationship between absorption and poverty but it rather insinuates that absorption play indirect role because of its impact on economic growth.

Conclusion

The Nigerian economy has undergone structural reforms over the years due to both internal and external instability. The dependant economy model which encompasses the reduction in absorption via fiscal adjustment and RER depreciation was adopted for this paper. However, in this paper we focused more on assessing the relationship between poverty and the RER. The main focus of the theory is that a deprecation of the RER is needed to curtail the surge of poverty on the ground that basic institutions are sound. The findings from both the VECM and the variance decomposition suggests that the RER could be an important instrument for poverty reduction provided other policies such as good effort towards human capital development are put in place.

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Appendix

Dependent Variable: DLPCY
Method: Least Squares
Date: 02/05/12 Time: 02:02
Sample(adjusted): 1982 2010
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLGSP(-2)	-0.134848	0.223164	-0.417276	0.6799
DLPE	0.241573	0.040659	5.941504	0.0000
DLREER	0.330277	0.080050	4.125869	0.0002
ECM(-1)	-0.445799	0.116786	-3.817234	0.0008
C	0.091222	0.075330	1.210960	0.2377
R-squared	0.839167	Mean dependent var		0.098697
Adjusted R-squared	0.819028	S.D. dependent var		0.456922
S.E. of regression	0.384932	Akaike info criterion		1.084083
Sum squared resid	3.556136	Schwarz criterion		1.319824
Log likelihood	-10.71921	F-statistic		33.86311
Durbin-Watson stat	2.343383	Prob(F-statistic)		0.000000