Bernhard O. Ishioro, Ph. D.

Department of Economics
Delta State University, Abraka
E-mail:ben_ishioro@yahoo.co.uk

THE DYNAMICS OF EXCHANGE RATE EXPECTATIONS FORMATION: THE NIGERIAN PERSPECTIVE

UDK / UDC: 336.748(669)
JEL klasifikacija / JEL classification: E44, F31
Izvorni znanstveni rad / Original scientific paper
Primljeno / Received: 10. srpnja 2014. / July 10, 2014
Prihvaćeno za tisak / Accepted for publishing: 19. studenog 2014. / November 19, 2014

Abstract

This paper examines the nature of exchange rate expectations formation (whether it is static, forward or backward looking) and the major macroeconomic determinants of exchange rate expectations formation process in Nigeria. Based on a robust review of both empirical and theoretical evidences, the paper applied unit root test, the Johansen cointegration and Error Correction Mechanism (ECM) in the validation of the nature of exchange rate expectations formation in Nigeria. The paper found that in the context of inflationary expectations, exchange rate expectations formation follows the structuralists' inflationary expectations. The paper also found that depending on the definition of exchange rate adopted, real income is significant in expectations formation and expectations formation does not follow the portfolio and chartists approaches. Previous changes in exchange rate were found to be significant in expectations formation depending on the definition of exchange adopted. The paper recommends that inflationary expectations should be incorporated into the policies of exchange rate expectations formation surveillance.

Key words: Exchange Rate, Financial Assets, Rational Expectations, Unit Root

1. INTRODUCTION

Exchange rate and expectations formation have been core and central issues in macroeconomic analysis from the very foundation of the subject (Moosa, 2000).But the formal analytical treatment of expectations formation has only occurred over the last 34 years. During this period it has, however, been one of the most important areas of advance in terms of research. Exchange rate according to Claassen (1997) does not only reflect the relative price of domestic and foreign goods, it also reflects the relative price of domestic and foreign financial assets. The principal financial role of exchange rate among others is to equilibrate the financial asset markets within an open economy with international capital movements. When international capital flows dominate the foreign market, they act as the determinants of short run movements of exchange rate. But without capital flows , that is, strict capital controls , the exchange rate would cease to be a financial asset price as a parallel exchange market will emerge in which the exchange rate will diverge from the official one.

As financial asset price (equilibrating financial asset markets), the foreign exchange rate has to be interpreted as implying that a change in the exchange rate is the major factor influencing the expected rate of return on financial assets (Claassen,1989; 1991). Rates of return are the dominant incentives for international financial capital flows where the domestic and foreign assets have the same maturity and are exposed to the same risk, the return on the domestic asset must therefore equal the expected return on the foreign assets (where the assets are perfect substitutes with respect to their returns) or the link could be less strict (i. e. where they are imperfect substitutes).

The need for the study of exchange rate expectations formation primarily arises because economic agents in deciding which course of action to follow are constantly faced with an uncertain environment prevalent in most developed and developing countries' financial sectors and markets. This is dependent on the source and nature of the uncertainty involved in a particular exchange rates decision .Uncertainty exists whenever individuals are not completely aware of the potential *n* consequences of their actions (Peasaran, 1981). Also, exchange rate expectations play a pivotal role in almost all monetary models especially for the open economy.

The breakthrough that allowed a more general approach to exchange rates expectations modeling came with the realization that expectations could be treated as an unobserved component. This means that expectations could be substituted by their determinants (exchange rates as financial assets and other domestic assets) once an explicit rule of expectations formation is assumed (see Nerlove 1958 and Cagan 1956).But a major disadvantage of this approach is the inability to efficiently assess the exchange rates on the long run. That is the reason why one of the major focuses of this paper is to assess the dynamics of exchange rates expectations formation using the macroeconomic determinants of exchange rates in the short-run. But for our purpose and within the dimension of

our interest, the dynamics of exchange rates expectations formation shall be examined from the point of view of economic theories such as: the monetary, the portfolio including the fundamentalists and the Chartists approaches to enable us form a modified mixed model with a wide spectrum of theoretical and empirical support.

Therefore, this study is directed at exploring how economic agents form exchange rates expectations using domestic financial assets such as commercial banks deposits and treasury bills. This is important for a number of reasons. No study has been carried out in this aspect for the Nigerian economy. These domestic financial assets are the most demanded in the Nigerian economy and as such would act as credible representative financial indicators in the context of a modified mixed model. Through this avenue, this study would contribute to the debate on the formulation and implementation of a macro-financial model. Furthermore, the study hopes to test the perfect substitutability hypothesis using macroeconomic and financial fundamentals from the Nigerian economy by applying both the monetary and portfolio perspectives. The economic theory for determining the foreign exchange rate which assumes perfect substitutability is known as the monetary approach to exchange rates expectation formation (Claassen, 1997).

Therefore, one of our aims (apart from the one stated above) is to examine the dynamics of foreign exchange rates expectations formation basically from the point of view of the monetary and portfolio approaches. This paper is therefore an attempt at assessing the dynamics of foreign exchange rate expectations formation based on the fundamental financial and macroeconomic variables in the Nigerian context.

Following the introduction, the rest of the paper is organized as follows: A review of theoretical and empirical literature is given in section two. Section three provides the methodology and data issues of the study while the fourth section presents the results of our estimated equations. Section five concludes the paper and examines the policy implications arising from the results of the study.

2. THEORETICAL AND EMPIRICAL REVIEW

2.1. Theoretical Review

Following the macroeconomic perspective, there are two major approaches with two supportive views to the theory of exchange rate expectations formation. The major approaches include the monetary and Portfolio approaches with the *fundamentalists* and *chartists* approaches as supportive views. The major theoretical studies were made by Frankel and Froot (1987a, 1987b, and 1987c); De Long *et al*., (1990); Lux (1998); Barberis *et al*., (1998) and more recently Ellen *et al*., (2011).These studies focused on the Chartists' and Fundamentalists' role in exchange rate expectations formation. Although there may be other approaches and views, the approaches mentioned above suffice for our purpose.

2.1.1. The Monetary Approach

According to Claassen (1997), the monetary approach when compared to the Portfolio approach is the first and simplest perspective of the financial approach to exchange rate expectations formation. The major assumption of the monetary approach is known as perfect substitutability of financial assets. This assumption is sometimes called the uncovered interest parity which states that the expected rate of depreciation of the local currency must equal the difference between the domestic and foreign rates of interest, Jha (2003). Other assumptions of the monetary approach include: Portfolios adjust instantaneously to disequilibrium; and the absence of any foreign exchange controls.

The perfect substitutability of domestic and foreign financial assets simply means that the rates of return on both asset categories are equal; this concept of equality of rates of returns is referred to as interest rate parity in the literature. A major issue relating to measurability is that, if the rates of returns are measured according to the units of the domestic currency (such as the Nigerian Naira), the rate of return on short –term domestic financial assets (such as the commercial banks deposits) is defined as the domestic returns on these assets.

But the monetary approach has been attacked severely on the grounds of both perfect substitutability and the uncovered interest rate parity because with perfect substitutability between domestic and foreign financial assets, any return differential between the two types of assets is immediately eliminated by exchange rate movements. Any divergence in the expected rates of return gives rise to incipient capital flows. The immediate reactions of the current exchange rate cancel the return differential so that the expected rates of return on domestic and foreign financial assets are equalized (interest rate parity).

Furthermore, we argue in line with Jha (2003) that even if domestic and foreign assets are similar (which is certainly not the case in Nigeria and in most developing countries) investors may perceive differences in risk caused by differences in liquidity, tax treatment, exchange risk, political risk and default risk.

Another important reason why investors might see domestic and foreign financial assets as imperfect at any point is that, international business cycles and national policies (domestic monetary policies) are not perfectly synchronized with respect to time, (Cumby and Obstfeld, 1981; Loopesko, 1984).

Nevertheless, in line with Isard (1991); some descriptive aspects of the monetary approach have been retained on pragmatic grounds.

2.1.2. The Portfolio Approach

The Portfolio approach to exchange rate expectations formation was primarily designed to overcome the inherent defects associated with the monetary approach. Both the Monetary and Portfolio approaches are summarized below in table 1.

Table 1

Summary of the Monetary and Portfolio Approaches to Exchange Rate Expectation Formation

Major Characteristics of the Approach	**APPROACHES**	
	Monetary Approach	**Portfolio Approach**
Mobility of Capital	Capital mobility is assumed to be unrestricted	Capital mobility is assumed to be either restricted or unrestricted
Substitutability of Financial Assets	Assumes perfect substitutability of foreign and domestic financial assets which also means risk neutrality.	Assumes imperfect substitutability of domestic and foreign financial assets connoting risk aversion.

Source: Adapted from Claassen (1997).

From table 1 above, the portfolio approach assumes that domestic and foreign financial assets are imperfect substitutes because financial asset holders are currency risk or exchange rate risk averse. The principal thematic assumptions of the Portfolio approach include: there is imperfect substitutability between domestic and foreign financial assets;

the investor is risk averse, and the uncovered interest rate parity with currency risk premium amongst others.

The reduced form of exchange rate determination under the assumption of imperfect substitutability of domestic and foreign financial assets according to the risk-premium-augmented uncovered interest rate parity paradigm can be mathematically stated as:

$$I_d = I_f + \frac{EXR^e - EXR_t}{EXR_t - CcR_t} \tag{1}$$

Where I_d is domestic interest rate on financial assets.

I_f is foreign interest rate.

EXR^e is the expected exchange rate

EXR_t is the current exchange rate.

CcR_t is the currency risk premium.

The adoption of equation (1) above deserves some explanations. As noted above in section 2.1.1 on monetary approach to exchange rate expectation formation, one of the major weaknesses as often explained in the literature is the uncovered interest rate parity which inversely means that if exchange rate risks are covered , the expected rates have to be replaced by the forward market rate for foreign exchange. But since the systematic failure of the rate as a reliable determinant of the future spot rates also has implications for the uncovered interest rate parity and uncovered interest rate cannot be tested directly; one of the ways of handling this systematic bias is to introduce a currency risk premium variable (CcR_t) as a negative term, (Claassen, 1997).

From equation (1), with static exchange rate expectations it can be deduced that;

$$\frac{\left(EXR^e - EXR_t\right)}{EXR_t} = 0\,, \tag{2}$$

The foreign interest rate is higher than the domestic interest rate by the amount of risk premium.

However, equation (1) is written as:

$$EXR_t = \frac{EXR_t^e}{1 + I_{d_t} - I_{f_t} + CcR_t} \tag{3}$$

Where EXR_t is the exchange rate prevalent at the beginning of period t.

EXR_t^e is the expected exchange rate for the end of period t.

An implicit assumption in equation (3) is that it took account of one period (where t denote either one month, three months or one year) and not of several periods to enable us form a link between the short-run and the long-run period. For the future period t+1, the exchange rate at the beginning of period t+1, that is EXR_{t+1}, will be determined by this equation:

$$EXR_{t+1} = \frac{EXR_{t+1}^e}{\left(1 + I_{d_{t+1}} - I_{f_{t+1}} + CcR_{t+1}\right)} \tag{4a}$$

The differences between equation (3) and (4a) are the periods of exchange rates expectations formation either (t) at the current period or the (t+1) for the future period. For equation (5) to satisfy our condition for expectations formation, EXR_{t+1} must be consistent with the expected exchange rate EXR_{t+1}^e such that:

$$EXR_t^e = EXR_{t+1} \tag{4b}$$

If EXR_t^e is substituted into equation (4a), we obtain:

$$EXR_t = \frac{EXR_{t+1}^e}{\left(1 + I_{d_{t+1}} - I_{f_{t+1}} + CcR_{t+1}\right)\left(1 + I_{d_{t+1}} - I_{f_{t+1}} + CcR_{t+1}\right)} \tag{5}$$

For $t+n^{th}$ expectations formation, we can transform equation (5) to obtain:

$$EXR_t = \frac{EXR_{t+n}^e}{\left(1 + I_{d_t} - I_{f_t} + CcR_t\right)\left(\left(1 + I_{d_{t+1}} - I_{f_{t+1}} + CcR_{t+1}\right)\right)...\left(1 + I_{d_{t+n}} - I_{f_{t+n}} + CcR_{t+n}\right)} \tag{6}$$

Equation (6) has been extended to contain an erratic number of periods where the last and longest periods are represented by $t+n$ for all categories of variables of interest whose behavioral pattern could be whimsical. This means the present exchange rate contains all information about the probable future values of $I_{d,}I_{f,}CcR$ and the long-run exchange rate EXR_{t+n}^e which is the anchor of the current exchange rate. Furthermore, Claassen (1997) argued that factors that can influence the expected future exchange rate EXR_{t+n}^e can also influence the current exchange rate (EXR_t). The current exchange rate depends on both next year's expected domestic and foreign interest rates and on the expected exchange rate *n* years from now.

2.1.3. The Fundamentalists Expectations Formation Models

Both the monetary and portfolio approaches considered above are of the fundamentalist's type. The fundamentalists look at the macroeconomic framework of exchange rates expectations formation based on interest rate differentials, etc. Based on the fundamentalists view, it is conceivable and even probable, that investors, given short horizons, tend to forecast by extrapolating from current trends (Metzler, 1941; Goodwin 1947 and more recently Marey, 2004) while over longer horizons, they predict a return to fundamental variables (such as relative prices).

This type of exchange rates expectations formation can be written as:

$$EXR^e = EXR_t + a\left(EXR_{1t} - EXR_t\right) \tag{7}$$

Where EXR_{1t} is the long run exchange rate. The coefficient *a (*where $a \leq 1$) indicates the time profile of expectations.

2.1.4. The Chartists Expectations Formation Model

The Chartists tend to forecast by extrapolating current trends if they have *bandwagon expectations* (trend following expectations mechanism). The most essential elements of the Chartists model are the perfect substitutability and uncovered interest rate parity (Marey, 2004; Frankel and Froot, 1987, 1989); the other element is the process of exchange rate expectation formation that rejects rational expectations in favor of extrapolative, adaptive (learning from forecast errors) and regressive expectations. However, the Chartists look at the past behaviors of exchange rates and extrapolate the past trend into the future. This simply implies that expectations are formed on the basis of past evolution of exchange rate with its previous value summing up the expected information. This is expressed as:

$$EXR^e = EXR_t + b\left(EXR_{1t} - EXR_{t-1}\right) \tag{8a}$$

OR

$$EXR^e - EXR_t = b\left(EXR_{1t} - EXR_{t-1}\right) \tag{8b}$$

Where EXR^e is the logarithm of the exchange rate that is expected at the current period. EXR_t is the logarithm of the nominal exchange rate observed at time t. EXR_{t-1} is the exchange rate of the previous period. Many other previous periods may be taken into account ($EXR_{t-2,\ldots,}EXR_{t-n}$). Three cases emerge from equation (8a) and (8b) based on the value and nature of *b*.First, if *b>0*, it implies that the expected exchange rate is a distributed lag of the observed nominal exchange rate (EXR_t).An asset holder that adopts the distributed expectations usually expects exchange rate increase to be followed by future decrease. Second, if *b<0*, the financial assets holder expects an exchange rate increase to be linked to a future increase. This follows the *bandwagon* expectations. Third, if *b=0*, the financial asset holder expects exchange rate to be static at the current period. This follows the static expectations paradigm.

Bénassy-Quéré *et al*., (1999) argued that the regressive model (mean-reverting expectation mechanism) could be classified as the Chartists model.

From equations (7) and (8a, 8b) we could establish a weighted average of expectations formation as suggested by Camen and Genberg (1990), and adapted by Claassen (1997) as:

$$\begin{aligned} EXR^e &= \left[\rho EXR + \rho a\left(EXR_{1t} - EXR\right)\right] + \left[(1-\rho)EXR + (1-\rho)b\left(EXR_t - EXR_{t-1}\right)\right] \\ &= EXR + \rho a\left(EXR_{1t} - EXR\right) + (1-\rho)b\left(EXR - EXR_{t-1}\right) \end{aligned} \tag{9}$$

If ρ is high, expectations are mainly formed on the basis of fundamentals. In which case, both the expected and the actual exchange would mainly reflect its fundamentals. But if ρ equals one, it reflects the framework of rational expectations. All the models of exchange rates that work with rational expectations are of the fundamentalists' type.

2.2. Empirical Review

There are two major perspectives to the empirical study and analysis of exchange rate expectations formation: the microeconomic and macroeconomic perspectives. The microeconomic perspective is mainly concerned with the behavior of individual investor, speculator and other market actors. This perspective is essentially determined by the analysis of the presumed behavior of the financial assets holder using surveys and laboratory experimental investigations. Studies that adopt the microeconomic perspective are often concerned with issues relating to irrational behavior of the economic agents, market heterogeneity, categories of actors and traders (trend followers, model followers and portfolio managers) and the rules guiding the behavior and actions of the market participants.

For instance, Bénassy-Quéré *et al*., (1999) studied the nature of exchange rate expectations formation of 40 leading foreign exchange forecasters/dealers. The extrapolative, adaptive, regressive and mixed models were used as the expectational structures for the determination of the process of expectation formation. Survey data sourced from the Consensus Forecasts of London for 3 and 12 months expectations of the US Dollar bilateral rates of the Deutsch Mark (Germany), Yen (Japanese) and Pound Sterling (England) for the period January 1990 to December 1994 were applied for the estimation of their models. Panel estimation technique (fixed and random effects) was adopted. The study found among others that: exchange rate expectations were found to be stable at the 3 and 12 months horizon. The study also found that the behavior of economic agents in the foreign exchange market is heterogeneous; and that agents rely more on public forecasts in most cases for expectation formation. A major criticism of this study is that the time span is too short to make meaningful policy recommendations. Macroeconomic aggregates were excluded from the study. This is a perilous and lamentable omission as exchange rate expectations are not only formed based on previous changes in exchange rate and non-macroeconomic variables. Other studies that used survey data include: Takagi (1991), Dominguez (1986), Frankel and Froot (1987a,1987b), Bank of Japan (1989), Froot and Frankel (1990), Ito (1990), MacDonald and Torrance (1988), Cavalgia *et al*., (1993), Chinn and Frankel (1994), Pratt and Uctum (1996), Kim (1997), MacDonald and Marsh (1996), Elliot and Ito (1999), Bénassy-Quéré, Larribean and MacDonald (2003),

Cheung and Wong (2000), Evans and Lyons (2004), Dreger and Stadtmann (2006). Most of these studies found support for the extrapolative and regressive expectations formation. These studies concluded that forecasting at horizon longer than three months confirm evidence for the presence of stabilizing expectations.

On the other hand, the macroeconomic perspective primarily applies the money demand function in studying the impact of macroeconomic and financial aggregates on exchange rate expectations formation. Financial market theories are used in the analysis of the behavior of the economic agent. Results obtained by these studies lend support to extrapolative, regressive, rational and adaptive expectations, and reveals that expectations regressive under hyperinflation. Most of these studies were specifically conducted on either the assumption of covered interest rates parity like Claassen and Wyplosz (1985), Frenkel and Levich (1975), (1977), Frenkel (1976), Clinton (1988), Taylor (1987), Fama (1984) or uncovered interest rate parity like Driskill (1981), Smith and Wickens (1990), Mussa (1984) and Taylor (1995). These studies focused on the investigation of the monetary, portfolio, the fundamentalists and Chartists hypotheses.

3. DATA AND ESTIMATION ISSUES

3.1. Source and Description of Data

This study used time series data on the variables obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin from 1970 to 2012. The series include exchange rate (*EXR*) defined as the official rate of the US Dollar to Naira (usually expressed as units of foreign currency per unit of domestic currency) while EXR_{t-1} is the one period lagged value of the current exchange rate. Also, we defined exchange rate in terms of the Naira cross exchange rate for the US Dollar ($EXRD$) and Pounds Sterling ($EXRP$).

The rate of returns on the demand deposits (*rorDMD*) is defined as three (3) months deposits rate. This is used as a representative variable for short time horizon and short term domestic financial asset.

The rate of returns on savings deposits (*rorSVD*) is defined as six (6) months deposits rate and,

The rate of returns on time deposits ($rorTMD1_t$ and $rorTMD2_t$) are defined as twelve (12) months and over twelve (12) months rates of return on time deposits. The time deposit is categorised into two to

represent long and longer time horizons. These deposits categories are measured as the domestic deposits rates (interest rates) on them. The rate of returns on the deposits indicate the relative yields on financial instruments denominated in the naira (measured in own currency terms). The rate of return on treasury bills (ror*TRB*) is defined as the Treasury bill rate. The deposits of commercial banks and treasury bills were used as proxies for domestic financial assets. Also, they serve as the financial indicators in the exchange rate model.

The income of the investor and financial assets holder (GDP_t) is defined as Gross Domestic Product (GDP) per capita deflated by inflation.

The rate of inflation (*INFL*) was also included as a macroeconomic fundamental that is essential in the exchange rate expectations formation process. The definitions and inclusion of income and inflation were adopted in consonance with the pragmatic practice of Dreger and Stadtmann (2006) and Mussa (1982) that referred to inflation and the income of the investor or financial assets holder as major macroeconomic fundamentals in exchange rate expectations formation. They argued that the current exchange rate is a function of the path taken by these macroeconomic fundamentals.

3.2. Model Specification

In the specification of the exchange rates expectations formation model, we took cognizance of the theoretical positions of Muth (1961), Sargent (1973), Leiderman (1982) and more recently Nyong (2001), that is, exchange rate expectations are conditioned on all the available information in the context of the rational expectations.

From equation (4) the reduced form of equations (3), (5), (6) and (7); a stylized specification of the determinants of exchange rate expectations formation is formulated assuming that: $EXR_t = EXR_t^e$.

So that the functional form is stated as:

$$EXR_t = a\left(EXR_{t-1}, INFL_t, GDP_t, rorSVD_t, rorDMD_t, rorTMD1_t, rorTMD2_t, rorTRB_t\right) \quad (10)$$

where α represents vector of the coefficients of the regressors.

$INFL_t$ represents rate of inflation at time t.

GDP_t represents a proxy for income of the investor at time t.

$rorSVD_t$ represents one to six(6) months rate of return on savings deposit at time t.

$rorDMD_t$ represents three (1-3) months rate of return on demand deposits at time t.

$rorTMD1_t$ represents twelve (12) months rate of return on time deposits at time t.

$rorTMD2_t$ represents above twelve (12) months rate of return on time deposits at time t.

$rorTRB_t$ represents rate of return on treasury bills at time t.

EXR_{t-1} = Exchange rate at time $(t-1)$ i.e. previous one year period. Three definitions of exchange rates were used in this study: the Naira cross exchange rate on the US Dollars; the Naira cross exchange rate on the British Pounds Sterling, and the official exchange rate.

The determinants of exchange rate were summarily presented by Salemi (1984), Oaikhenan and Edo (2000), and Obadan (2007, 2012). These studies noted that exchange rate expectations formation react as any other price of financial assets to its demand and supply while over the long-run, its value may be dominated by fundamental economic factors. From the substitutability (of foreign and domestic financial assets) clause of both the portfolio and the monetary approaches, the determinants of the demand for domestic financial assets *vis-a-vis* the foreign assets can be incorporated into the short-run approach as determinants since the short-run takes into cognizance one month, three months, or one year as applied by Bénassy-Quéré *et al*., (1999) and, Dreger and Stadtmann (2006). The determinants are expressed in an econometric model (a modified mixed model) as:

$$EXR_t = a_0 + a_1 * EXR_{t-1} + a_2 * INFL_t + a_3 * LGDP_t + a_4 * rorDMD_t + a_5 * rorTMD1_t + a_6 * rorTMD2_t + a_7 * rorSVD_t + a_8 * rorTRB_t + \varepsilon_t \quad (11a)$$

$$EXRD_t = \Phi_0 + \Phi_1 * EXRD_{t-1} + \Phi_2 * INFL_t + \Phi_3 * LGDP_t + \Phi_4 * rorDMD_t + \Phi_5 * rorTMD1_t + \Phi_6 * rorTMD2_t + \Phi_7 * rorSVD_t + \Phi_8 * rorTRB_t + \varepsilon_t \quad (11b)$$

$$EXRP_t = b_0 + b_1 * EXRP_{t-1} + b_2 * INFL_t + b_3 * LGDP_t + b_4 * rorDMD_t + b_5 * rorTMD1_t + b_6 * rorTMD2_t + b_7 * rorSVD_t + b_8 * rorTRB_t + \varepsilon_t \quad (11c)$$

The expected signs of the coefficients for equation (11a) are: $a_1, a_3 \rangle 0,\ a_2, a_4, a_5, a_6, a_7, a_8 \langle 0$

The expected signs of the coefficients for equation (11b) are: $\Phi_1, \Phi_3 \rangle 0,\ \Phi_2, \Phi_4, \Phi_5, \Phi_6, \Phi_7, \Phi_8 \langle 0$

The expected signs of the coefficients for equation (11c) are: $b_1, b_3 \rangle 0, \quad b_2, b_4, b_5, b_6, b_7, b_8 \langle 0$

The coefficient for the previous period(one year) exchange rate (EXR_{t-1}) is expected to be positive connoting the fact that current expectations are formed based on the nature of the previous period exchange rate. Also, the sign of the coefficient of Income is positive reflecting the transactionary money income which is expected to increase the current demand for exchange rate as it increases (akin to Nyong, 2001; and Leiderman, 1981).

The negative signs of the coefficients of the rates of returns of banks demand, savings, time deposits and Treasury bill rate are anchored on the hypothesis of financial assets substitutability based on the Portfolio theory (Claassen, 1997 and Nnanna, 2002). The Nigerian economy is an open economy, therefore, it is expected that the portfolio of the investor be made of both domestic and foreign financial assets. As the returns on the domestic assets become more attractive, foreign financial assets in the portfolio of the investor reduces as posited by the assets substitutability hypothesis. Hence, negative signs are attached to the coefficients of these domestic assets.

The coefficient of the rate of inflation is negative based on the *structuralists'* perspective that the scarcity of foreign exchange is synonymous with high inflationary rate, that is, inflation results from the presence of structural rigidities of exchange rate leading to exchange rate depreciation (Nyong, 2001; Oaikhenan and Edo, 2000). A single model was specified for all categories of financial assets holders based on the assumption of the coexistence of different types of financial assets holders as suggested by Bénassy-Quéré *et al*. (1999).

Equation (11a, 11b and 11c) can be specified in four degenerate and specific forms:

$$EXR_t = b_0 + b_1 * EXR_{t-j} + b_2 * INFL_{t-j} + \varepsilon_t \qquad (12)$$

Equation (12) is specified to test the impact of inflationary expectations on exchange rate expectations formation.

$$EXR_t = c_0 + c_1 * EXR_{t-1} + c_2 * GDP_{t-1} + c_3 * rorTRB_{t-1} + c_4 * INFL_{t-1} + \varepsilon_t \qquad (13a)$$

$$EXR_t = d_0 + d_1 * EXR_{t-1} + d_2 * GDP_{t-1} + d_3 * rorTMD1_{t-1} + d_4 * rorTRB_{t-1} + d_5 * INFL_{t-1} + \varepsilon_t \qquad (13b)$$

$$EXR_t = \Theta_0 + \Theta_1 * EXR_{t-1} + \Theta_2 * GDP_{t-1} + \Theta_3 * rorTMD2_{t-1} + \Theta_4 * rorTRB_{t-1} + \Theta_5 * INFL_{t-1} + \varepsilon_t \qquad (13c)$$

$$EXR_t = e_0 + e_1 * EXR_{t-1} + e_2 * GDP_{t-1} + e_3 * rorDMD_{t-1} + e_4 * rorTRB_{t-1} + e_5 * INFL_{t-1} + \varepsilon_t \qquad (13d)$$

Equation (13a) is specified to ascertain the impact of income of the investor and treasury bills on exchange rate expectations formation. Equation (13b), (13c) and (13d) were specified based on the financial assets substitutability hypothesis. Models were specified for only two categories of deposits (with time deposit having two variants) because of the nature of returns. Demand deposits incur a cost for the financial asset holder while time deposits or saving deposits yields a positive return (income) for the financial asset holder. In equation (11a, 11b and 11c), (12), (13a, 13b, 13c and 13d); the signs of the coefficients of the regressors and their impacts are expected to be in line with standard theories of exchange rate determination (Dreger and Stadtmann, 2006).

3.3. Estimation Techniques

3.3.1. Stationarity and Unit Root Tests

Serious problems are often encountered in econometric analysis if the time series are non-stationary. A study like Phillips (1986) has shown that the statistical properties of regression analysis that applies non-stationary time series are unreliable and at best dubious (Charemza and Deadman, 1993). Furthermore, stationarity (unit root) tests will help us avoid the implicit danger often emanating from interpreting regression outcomes for time series variables that are deterministically trended(almost always diverging in time).

We applied the Augmented Dickey Fuller (ADF) unit root test. We tested for the stationarity of our series with a view to ascertaining their order of integration (whether the rates of returns on the deposits categories are persistent or not as reported by Perron (1988) and, Stock and Watson (1988)). These studies reported the presence of unit root at levels showing that the rate of returns were persistent. Issues relating to stationarity and determination of the order of integration are exhaustively treated in (Omotor 2007, 2008a, 2008b, 2008c and 2009; Banerjee *et al*., 1986 and 1992; Domowitz and Elbadawi, 1987; Engle and Granger (1987); Hendry (1989); Johansen and Juselius (1990); Hendry and Ericsson (1991); Granger and Newbold (1974, 1986); Said and Dickey (1984); Podvinsky (1990) and Blangiewicz and Charemza (1990) amongst others.

3.3.2. Cointegration/Long-Run Relationship

The Johansen cointegration test was applied in the determination of the long-run equilibrium relationship among the variables of interest. According to Engle and Granger (1987) and, Charemza and Deadman (1993) two time series variables X_t and Y_t are cointegrated of order *d* or *b*

given that $d \geq b \geq 0$. This is specified as: $X_t, Y_t \sim CI(d,b)$. This is subject to the condition that both series must be necessarily integrated of order d (the same order; and there exists a linear combination of the two variables such that $\alpha_1.X_t + \alpha_2.Y_t$ is integrated of order $d-b$.

If there is a long- run relationship between two (or more) of the series that are $I(d)$; any deviation from the long-run path becomes $I(0)$ implying that the series are cointegrated.

3.3.3. Error Correction Mechanism (ECM)/Short-Run Relationship

The short-run analysis based on the Error Correction Mechanism (ECM) is adopted in this study. The ECM was adopted in this study for the following reasons. Whelan (2013) argued that models used to analyzed rational expectations must move from the structural form to the reduce form. Rational expectations models are usually formulated by assuming that the driving variables are generated by backward looking time series models such as ECM. The ECM usually permits the modelling of the short-run adjustments that lead to a long-run equilibrium, that is, it incorporates both changes in short-run adjustment and long-run equilibrium. Furthermore, the ECM when adopted in the estimation of exchange rate expectation formation permits the integration of short-term fluctuations around the long-run equilibrium.

In order for the model to incorporate the ECM, Charemza and Deadman (1993) posited that the two (or more) series in the long-run relationship must be integrated of the same order and the error term must necessarily be I (0). This is why Engle and Granger (1987) argued that any cointegrated series have an error correction representation implying that cointegration is a necessary condition for error correction to hold (see Engle and Granger 1991). A corollary to that argument is that, if all the series are I(0) and the error term I(0) then cointegration analysis is not necessary.

4. ANALYSES OF RESULTS

4.1. Results of Unit Root Test

The results of the Augmented Dickey Fuller tests are presented in table 2 below. Eight series employed in this study are shown using their representative symbols.

Table 2

Unit Root Tests Results

Variable	LEVEL			FIRST DIFFERENCE	ORDER OF INTEGRATION
	Intercept	Intercept/Trend	None		
EXR	-1.1697	-1.8273	-0.7519	-4.0884*	I(1)
EXRD	0.1221	-2.3319	1.6213	-5.5641*	I(1)
EXRP	-0.2123	-2.5011	1.0954	-6.0251*	I(1)
INFL	-2.7914	-3.5222	-1.7079	-5.3706*	I(1)
GDP	-0.01188	-1.9055	1.3758	-1.6104***	I(1)
rorDMD	-2.8611	-2.8609	-0.3005	-2.5124**	I(1)
rorSVD	-2.2620	-2.5664	0.7654	-4.9450*	I(1)
rorTMD1	-2.3892	-3.4211	-0.3952	-6.2582*	I(1)
rorTMD2	-2.4159	-2.6730	-0.7907	-7.0416*	I(1)
rorTRB	-2.4381	-2.6434	-0.8311	-6.7516*	I(1)

Source: Author's computation

Note: * and ** connote 1 percent and 5 percent level of significance respectively.

All the variables were stationary at first difference (integrated of order one). Therefore, it is obvious from Table 2 above that the null hypotheses of no unit roots for all the time series are rejected at their first differences since the ADF test statistic values are less than the critical values at the different levels of significances.

4.2. Cointegration Result

4.2.1. Cointegration Result for All Series

The cointegration results are presented in two categories. The first category covers the series in the study. The first category is also reported in two forms (see tables 3a and 3b): Trace statistic and Maximum Eigen value tests. The second category focused on exchange rates and the rate of inflation (see table 3c below)

Table 3a

Results of the Johansen Cointegration Analysis (Trace Statistic)

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Probability
None **	0.8975	254.03	159.53	0.0000
At Most 1 **	0.8652	183.42	125.62	0.0000
At Most 2 **	0.7639	121.29	95.75	0.0003
At Most 3 **	0.6536	76.54	69.82	0.0132
At Most 4	0.4636	43.68	47.36	0.1169
At Most 5	0.3650	24.37	29.79	0.1853
At Most 6	0.2821	10.29	15.47	0.2591
At Most 7	0.00041	0.0137	3.84	0.9067

Source: Author's Computation

Note: *(**) denotes rejection of the hypothesis at 5 percent (1 percent) significance level. Trace statistic test indicates four (4) cointegrating equations at 5 percent significance level.

We established based on the result of the Johansen cointegration test that there are four cointegrating equations for exchange rate, demand deposits, saving deposits, time deposits, treasury bills rate, income and rate of inflation. The existence of cointegrating equations means that there is long-run relationship among the variables in the model. Furthermore, the existence of a long-run equilibrium relationship simply means that if any of the variables used in the model deviate from its long-run mean value as a result of a disturbance, it will return to the common long-run equilibrium as soon as the disturbance weakens and is over.

Table 3b

Results of the Johansen Cointegration Analysis (Maximum Eigen Statistic)

Hypothesized No. of CE(s)	**Eigen Value**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Probability**
None **	0.8975	70.60	52..36	0.0003
At Most 1 **	0.8652	62.13	46.23	0.0005
At Most 2 **	0.7639	44.76	40.08	0.0138
At Most 3**	0.6536	33.88	30.86	0.0257
At Most 4	0.4636	19.31	27.53	0.3911
At Most 5	0.3650	14.079	21.13	0.3586
At Most 6	0.2821	10.28	14.26	0.1945
At Most 7	0.00041	0.0137	3.84	0.9067

Source: Author's Computation

Note: *(**) denotes rejection of the hypothesis at 5 percent (1 percent) significance level. Maximum Eigen statistic test indicates four (4) cointegrating equations at 5 percent significance level

The maximum Eigen Statistic confirms the existence of four (4) cointegrating equations or vectors at the 1 percent level of significance.

4.2.1. Cointegration Result for Exchange Rates and Inflation

The cointegration test examined the long–run relationship between exchange rate and rate of inflation. Table 3c presents the results of the likelihood ratio tests for the number of cointegrating vectors.

Table 3c

Results of the Johansen Cointegration Analysis (Trace Statistic)

Hypothesized No. of CE(s)	**Eigen Value**	**Trace Statistic**	**0.05 Critical Value**	**Probability**
None *	0.493	27.56	25.87	0.0200
At Most 1	0.202	6.82	12.52	0.371
Maximum Eigen Statistic				
Hypothesized No. of CE(s)	**Eigen Value**	**Maximum Eigen Statistic**	**0.05 Critical Value**	**Probability**
None *	0.493	20.70	19.39	0.0200
At Most 1	0.202	6.82	12.52	0.371

Source: Author's Computation

Note: *(**) denotes rejection of the hypothesis at 5 percent (1 percent) significance level. Trace statistic and Maximum Eigen tests indicate one (1) cointegrating equation at 5 percent significance level

Both the trace statistic and maximum Eigen statistic confirm the existence of 1 cointegrating vector or equation. This implies the existence of a long-run relationship between exchange rate expectations and rate of inflation.

4.3. Error Correction Mechanism Result

Having established the existence of a long-run relationship among the variable, we tested the residuals for stationarity to ascertain the applicability of ECM or otherwise. The results of the residuals test for stationarity are shown below in table 4.

4.3.1. Augmented Dickey Fuller Unit Root Test on Residuals

Table 4

Augmented Unit Root Tests of Residuals

Residual	ADF Statistic	Decision	Optimal Lag Length
ECM 1	-3.2604	Stationary at levels	2 with no constant
ECM 2	-4.5754	Stationary at levels	2 with no constant
ECM 3	-2.9855	Stationary at levels	2 with no constant
ECM 4	-2.4350	Stationary at levels	2 with no constant

Source: Author's Computation

Note: ECM 1 represents the residual obtained from the long-run exchange rate/inflationary expectations model. ECM 2 represents the residual obtained from the long-run exchange rate/income model. ECM 3 and ECM 4 represent the residual obtained from the long-run exchange rate/domestic financial assets model.

The results of the ADF unit root test of residuals of the long-run models (3a), (b), (c) and (d) are reported in table above. The optimal lag lengths used are also reported. Recall that if the residuals obtained from the long-run version of equation (12), (13a, b, c and d) are non-stationary; then the estimated long-run relationship connotes a spurious regression. But if the residuals are stationary, then the estimated long-run relationship implies a cointegrating relationship.

To test the stationarity of the residuals, we adopted ADF test where the critical values tabulated by Mackinnon (1996) are compared with the ADF statistic. The estimated ADF statistics were less than the Mackinnon critical value (-1.95) at the 5% significance level. The results of the ADF unit root test show that the residuals were stationary at level which implies that we reject the null hypothesis of unit root in the residual errors; implying also that the variables are cointegrated. Hence, we proceed to the ECM estimation.

4.3.2. ECM Result for Exchange Rate and Inflationary Expectation Model

The result of the ECM using exchange rate defined as the official exchange rate of the US Dollar to Naira is presented in the table shown below. Exchange rate was used as the dependent variable while the independent variables include the differenced value of income, rate of inflation, the differenced value of exchange rate with error correction parameter.

Table 5

Result of Error Correction Mechanism (ECM) for Exchange Rate and Inflationary Expectation Model

Table Variable	Coefficient	Standard Errors	t-stat	Prob.
C	91.880	10.302	8.918	0.000
DEXR (-1)	46.841	0.195	-1.733	0.019
DEXR (-2)	24.612	0.189	-1.310	0.201
DINFL (-1)	-1.273	0.384	-3.316	0.002
ECM (-1)	-0.420	0.685	1.490	0.241

Source: Author's Computation

$R^2 = 0.63$ Adjusted $R^2 = 0.59$ DW = 1.827 Prob. (F-statistic) = 0.0000

The signs of the coefficients of the regressors satisfy our *a priori* / theoretical expectations. The negative sign of the coefficient of inflation connotes that based on the immediate past period performance of inflation, financial assets holders form negative expectations about the current performance of exchange rates. The value of the R square means that about 63 percent of the variation in the regressand is explained by the variations in the regressors. The short-run analysis based on the ECM shows that in Nigeria within the period under consideration, exchange rate of the previous period that is, the lagged value of exchange rate (EXR(-1)) for the immediate past period is statistically significant in explaining exchange rate expectations formation. In consonance with Bénassy-Quéré *et al*., (1999), this implies that investors/ financial assets holders use previous period exchange rate change as a veritable instrument for predicting current/subsequent period changes in exchange rate. This means that the magnitude of a previous forecast error is offset in the current/next period by a statistically significant proportion. This is a validation of the forward looking hypothesis. The results also show that inflationary expectations of the immediate past period (one period) is statistically significant in explaining exchange rate expectations formation. The coefficient of the error correction term in the exchange rate/inflationary expectations equation is negative, but statistically insignificant. This means that the error correction term does not contribute to the explanation of the changes in exchange rates expectation formation. Furthermore, since the error term is

statistically insignificant, it suggests the existence of unidirectional causality running from the lagged value of real inflation to exchange rates. In the context of inflationary expectation, about 0.42 of the discrepancy in the equilibrium value in the previous period is eliminated in the current period. Within the framework of inflationary expectation, exchange rate expectations formation adjusts at a relatively high speed.

4.3.3. Error Correction Mechanism: Result for Exchange Rate and Real Income Model

Table 6

Results of Error Correction Mechanism: Exchange Rate and Real Income

Table Variable	Coefficient	Standard Error	t-statistic	Probability.
C	55.831	9.860	5.664	0.0000
DEXP (-1)	0.119	0.491	0.243	0.0025
DLGDPC (-1)	0.620	4.246	2.045	0.0011
DINFL (-1)	-0.265	1.185	-2.362	0.233
ECM (-1)	-0.514	0.496	1.477	0.163

Source: Author's Computation

$R^2 = 0.54$ Adjusted $R^2 = 0.49$ DW = 2.010

The hypothesis that income is fundamental to the demand for exchange rates and financial assets substitutability hypothesis under the rational expectations model is validated in all the models in this study because the coefficient of the income variable was statistically significant and had the right sign in the short-run. This means that income is fundamental to exchange rate expectations formation in Nigeria.

4.3.4. Results of Error Correction Mechanism: Exchange Rate and Rate of Returns on Demand Deposit

The results of the ECM using exchange rate defined as Naira cross exchange rate on US Dollars are presented in the table shown below. Exchange rate was used as the regressand while the regressors include the differenced value of demand deposits (three months) bank rate on deposits), income, rate of inflation, the differenced value of exchange rate with error correction parameter. This represents a short-time horizon.

Table 7

Results of Error Correction Mechanism (ECM): Exchange Rate and Domestic Financial Assets (Demand Deposits)

Variable	Coefficient	Standard Errors	t-statistic	Probability
C	142.018	23.043	0.1660	0.0000
DEXRD(-1)	0.456	0.403	1.1298	0.2688
DLGDPC(-1)	0.00077	0.0003	2.510	0.0268
DrorDMD(-1)	-7.0009	1.757	-3.990	0.0005
DINFL (-1)	-0.308	0.424	2.172	0.0047
ECM (-1)	-0.224	0.438	0.0384	0.6910

Source: Author's Computation

$R^2 = 0.49$ Adjusted $R^2 = 0.39$ DW = 1.868 Prob.(F-Statistic) = 0.0024

The results of the exchange rate expectation formation based on the hypothesis of financial assets perfect substitutability are shown in table 7 above. The domestic financial assets (demand deposits) used in this study was statistically significant. This shows that the hypothesis of perfect substitutability of financial assets between domestic and foreign assets either explain or support exchange rates expectation formation in Nigeria during the period under consideration. Conversely, the results seem to invalidate the financial assets imperfect substitutability hypothesis of the portfolio approach.

4.3.5. Results of Error Correction Mechanism: Exchange Rate and One Year Time Deposit Rate

The results of the ECM using exchange rate defined as Naira cross exchange rate on US Dollars are presented in the table shown below. Exchange rate was used as the dependent variable while the independent variables include the differenced value of time deposits (one year (twelve months) bank rate on deposit), income, rate of inflation, the differenced value of exchange rate with error correction parameter.

Table 8

Results ECM Exchange Rate and Domestic Financial Assets (Twelve Months' Time Deposits Rate)

Variable	Coefficient	Standard Errors	t statistic	Probability.
C	140.590	19.364	7.253	0.0000
DEXRD(-1)	0.475	0.375	1.267	0.0030
DLGDPC(-1)	0.000695	0.00027	2.490	0.0195
DrorTMD1(-1)	-6.697	1.417	-4.728	0.0001
DINFL (-1)	-0.305	0.391	0.780	0.0368
ECM (-1)	-0.160	0.413	-0.376	0.710

Source: Author's Computation

$R^2 = 0.56$ Adjusted. $R^2 = 0.47$ DW = 1.951 Prob. (F-Statistic) = 0.00044

The results shown in table 8 above indicate that using the 12 months time deposit rate as a proxy for domestic financial asset, the perfect substitutability of financial assets is supported in the Nigerian context Although the ECM results show that the speed of adjustment of the model is about 16 percent, the coefficient of the error correction term is not statistically significant. In reality, the results can be explained in the context of either the portfolio or monetary approach because if the financial assets holders are risk averse, they won't consider the returns on foreign financial assets as substitutable with the riskless returns on domestic financial assets. In which case, the financial assets holder will almost always require a higher yield on foreign financial assets as substitute for their risk aversion. Alternatively, the investors will hedge against the currency risk in the forward exchange market.

4.3.6. Results of Error Correction Mechanism: Exchange Rate and Over One Year Time Deposit Rate

The results of the ECM using exchange rate defined as Naira cross exchange rate on the British Pounds Sterling are presented in the table shown below. Exchange rate was used as the dependent variable while the independent variables include time deposits (defined as over one year bank rate on deposit), income, rate of inflation, the differenced value of exchange rate with error correction parameter. A single domestic financial asset version of equation (3c) was used.

Table 9

Results of ECM: Exchange Rate and Domestic Financial Assets (Over One Year Time Deposit Rate)

Variable	Coefficient	Standard Errors	t- statistic	Probability.
C	130.956	14.324	9.130	0.0000
DEXRP(-1)	0.373	0.330	1.129	0.2600
DLGDPC(-1)	0.006	0.00025	2.665	0.0130
DrorTMD2(-1)	-6.109	1.036	-5.892	0.0000
DINFL (-1)	-0.166	0.339	3.489	0.0041
ECM (-1)	-0.110	0.346	0.319	0.752

Source: Author's Computation

$R^2 = 0.64$ Adj. $R^2 = 0.58$ DW = 1.909

The Error Correction Mechanism (ECM) result shown in table 9 above denoted that the coefficients of the regressors had the expected signs. The dependent variable used for the above ECM model is the Naira cross exchange rate to the Pounds Sterling. The domestic financial asset referred to in the model in the time deposit defined as banks deposit rate of over one year a proxy for "longer time horizon". The negative sign of the coefficient of time deposit

connotes that as expectations of increase in the rate of returns of the financial asset heighten coupled with the evidence of previous increase in the rate of returns; the demand for Pounds sterling will decrease. This means that over the longer period horizon, time deposit is a key determinant of exchange rate expectations formation in Nigeria. The R square suggests that about 64 percent of the variation in the dependent variable was accounted for by the variation in the independent variables. From the results shown above, the error correction term is negative but statistically insignificant. It has a value of -0.110. This value connotes the rate of convergence to the equilibrium state per year. Explicitly, the speed of adjustment of any disequilibrium in this model towards a long-run equilibrium is about 11 percent of the disequilibrium of the previous period is corrected in the current period.

4.3.7. Results of Error Correction Mechanism (ECM): Exchange Rate and Treasury Bills

The results of the ECM using exchange rate defined as Naira cross exchange rate on Pounds Sterling are presented in the table shown below. Exchange rate was used as the dependent variable while the independent variables include treasury bills, income, rate of inflation, the differenced value of exchange rate with error correction parameter.

Table 10

Results of Error Correction Mechanism (ECM): Exchange Rate and Domestic Financial Assets (Treasury Bills)

Variable	Coefficient	Standard Error	t-statistic	Probability
C	121.709	14.638	8.315	0.0000
DEXRP(-1)	0.618	0.366	1.690	0.1030
DLGDPC(-1)	0.00051	0.000026	1.936	0.0640
DrorTRB(-1)	-5.686	1.1063	-5.140	0.0000
DINFL (-1)	-0.055	0.362	0.153	0.2430
ECM (-1)	-0.492	0.358	1.374	0.1813

Source: Author's Computation

$R^2 = 0.59$ Adjusted $R^2 = 0.51$ DW = 1.868 Prob.(F-Statistic) = 0.00016

The exchange rate of Naira on Pounds Sterling is used as regressand and Treasury bill rate is used as a proxy for domestic financial asset in ECM results are presented above. The perfect substitutability hypothesis of financial is validated by our results. All the variables had the right and expected signs and are statistically significant except the one-period differenced values of exchange rate and inflation. The negative sign of the coefficient of the treasury bill rate implies that an increase in the own rate of treasury bills leads to an increase in its demand with a decrease in the demand for alternative financial assets including the Naira on Pounds Sterling

exchange rates. This further implies that the financial assets holder considers these assets as perfect substitutes. Hence if the rate of returns on treasury bills is above the rate of returns on the foreign asset it will appreciate relative to its equilibrium value while the other depreciate in value.

The error correction term connotes the fact that about 49.2 percent of the disequilibrium in the previous period is corrected in the current period.

5. CONCLUSION AND POLICY RECOMMENDATIONS OF OUR FINDINGS

This paper used time series data of selected macroeconomic and financial fundamentals (as inflation, treasury bill rate, demand deposits, saving deposits and time deposits, and real GDP per capita) to investigate how exchange rate expectations formed in Nigeria. The paper adopted a modified mixed model based on the Portfolio, Chartists and Fundamentalists' approaches. Exchange rate expectation is linked to inflationary expectations in Nigeria depending on the exchange rate definition that is adopted. Hence, inflationary expectations are adjudged to be quintessential to exchange rate expectations formation in Nigeria in the short-run. In the long-run, it was found that a long-run equilibrium relationship exist between exchange rates and rate of inflation. Thus, exchange rate expectations can be stabilized and controlled through inflationary expectations monitoring and regulation. There is need to curtail inflation in order to restore stability to exchange rate expectations formation in Nigeria. Also, the study found that the over one year rate of returns on time deposit is a determinant of exchange rates expectations formation in Nigeria. The policy implication of this finding is that, exchange rate expectations formation should be controlled in alliance with the monetary designed and implemented to regulate commercial banks deposits. Furthermore, banks deposits should be used as potent instrument for the control of exchange rates in Nigeria. This further suggests that bank deposits especially time deposit are sensitive monetary policy weapon for the regulation of both the external and domestic economies. The hypothesis of exchange rates expectation formation based on the monetary approach's perfect substitutability of financial assets in the Nigerian context is not validated by our results. This means that exchange rate expectations formation in Nigeria follows financial assets imperfect substitutability of the portfolio model. GDP per capita (income) is statistically significant in the explanation of exchange rate expectation formation in this study during the period under consideration. This paper found support for the regressive models of exchange rate expectations formation thereby extending the results obtained by the backward looking models.

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Dr. sc. Bernhard O. Ishioro

Odjel za Ekonomiju
Delta State University, Abraka.
E-mail:ben_ishioro@yahoo.co.uk

DINAMIKA FORMIRANJA OČEKIVANJA DEVIZNOG TEČAJA: PRIMJER NIGERIJE

Sažetak

U radu se analizira priroda formiranja očekivanja deviznog tečaja (statičnog, orijentiranog naprijed ili natrag) i glavnih makroekonomskih odrednica tog procesa u Nigeriji. Temeljem jasnog pregleda empirijskih i teoretskih dokaza, u radu se primjenjuje test jediničnog korijena, Johansenova metoda kointegracije, model korekcije odstupanja (ECM) u vrednovanju prirode formiranja očekivanja deviznog tečaja u Nigeriji. Utvrđeno je da se u kontekstu inflatornih očekivanja pri spomenutome slijede inflatorna očekivanja strukturalista. U radu je također prikazano da, ovisno o definiciji prihvaćenog deviznog tečaja, realni dohodak je značajan za formiranje očekivanja, a ono ne slijedi portfelj i pristupe „chartista". Zaključeno je da su prethodne promjene deviznog tečaja značajne u formiranju očekivanja ovisno o definiciji prihvaćenog tečaja. U radu se preporuča uključivanje inflatornih očekivanja u politike nadzora formiranja očekivanja deviznog tečaja.

Ključne riječi: devizni tečaj, financijska imovina, racionalna očekivanja, jedinični korijen

JEL klasifikacija: E44, F31