THE CAUSATIVE FACTORS IN EXCHANGE RATE BEHAVIOUR AND ITS IMPACT ON GROWTH OF NIGERIAN ECONOMY

Ogunsakin Sanya, PhD

Department Of Economics, Faculty Of The Social Sciences, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

Abstract

This paper examines the causative factors in exchange rate behavior and its impact on the growth of the Nigerian economy. The study employee's con-integration and error correction as her estimation technique. The results obtained from the estimation were generally satisfactory. Specifically, they showed among others that all variables employed in the study are significant determinants growth of Nigerian Economy. The policy implications of our study are discussed. Among them are government should maintain more depreciated real exchange rate, higher saving to investment and lower expenditure relative to income.

Keywords: Exchange rate, Economic growth, Nigeria

Introduction

The literature has established that the exchange rate is the rate at which a currency is exchanged for another. This simply means that for an exchange rate to emerge, two or more countries with different currencies are involved. The exchange rate is important in the study of macroeconomic management, since it reflects the performance of both domestic and external sectors of an economy. Tawose (2009). However, Economists have long known that the poorly managed exchange rate can be disastrous for economic growth. Avoiding significant overvaluation of the currency is one of most robust imperatives that can be gleaned from the diverse experience with economic growth around the world, and it is one that appears to be strongly supported by cross country statistical evidence (Razin and Collines, 1997, Johnson Ostry and Subramamanian 2007, Rajan and Subramamanian (2007) as cited by Dani Rodrik (2008).

The exchange rate is a significant macroeconomic variable in an economy. Its behavior determines to a large extent the behavior of several other macroeconomic variables

in an economy. This is especially so in highly import dependent economies such as Nigeria. Consequently, it is hardly surprising that most countries of the world pay close attention to the behavior of the exchange rate of their currencies vis-a-vis other currencies of the world. This is on account of the fact that apart from the implication its behavior has for the competitiveness of a country's goods and services around. It also has implications for the country or otherwise of an economic as well as the strength of the economy within the comity of nations. Oaikhenana (2000). Prior to September, 1986 when the then military regime of President Ibrahim Babangida introduced structural adjustment programme (SAP) exchange rate as macroeconomic variable was little known in Nigeria. By the time the structural adjustment program was implemented, the Nigerian economy has begun to witness some strains which prompted the enunciation of an austerity package. As the cost of import was crippling local manufacturers, a new industrialization policy was promulgated that required that goods that were hitherto imported be sourced and produced domestically in order to reduce the vulnerability of the economy to negative external shocks and promote the balance of payment. This industrialization policy was also aimed at promoting the export of manufactured goods. Moreover, the post-SAP reforms period was characterized by a mixed trade policy stance while export promotion confirmed, some controls were exercised on imports. In the same vein, the foreign exchange allocation mechanism witnessed reforms especially in the determination of the official exchange rate. Thus, the rate at the Autonomous Foreign exchange market (AFEM) which subsequently changed to inter-Bank Foreign Exchange market (IFEM) rate in the late 2000 and to Dutch Auction System in 2002. Ogikhenan and Edo (2000).

The remainder of the paper proceeds as follows section 2 presents the conceptual background of the study, section 3 discuss theoretical framework and model specification. Section 4 presents data and analysis of results, section 5 concludes the paper.

Conceptual Background

Exchange Rates Reforms and Incentives Structure

Prior to SAP (1970 to 1985), banks operated under highly regulated environment, characterized by fixed exchange rate structures guided by official financial markets. In particular, an official foreign exchange market was operated by the central bank which allocated foreign exchange to end users based on import licensing procedures at predetermined rates. Incidentally, this system led to huge unpaid trade arrears and external debts coupled with exchange rate overvaluation. With the adoption of SAP, this procedure was abolished and replaced with a two-tier market structure. While the official window was

initially retained for special government transactions and debt service, the Second Tier Foreign Exchange Market, a Dutch-Auction System in which financial institutions bid to purchase foreign exchange at the market-clearing rates for their intended beneficiaries, was introduced. This system laid the foundation for exchange rate devaluation and the emergence of multiple exchange rate systems in Nigeria. However during the Reforms Lethargy era (1994 to 1998), which was characterized by adjustment fatigue with lots of policy reversals following the change in government, there was a return to regulation. The foreign exchange market was segmented into two: official window which accommodated government transactions at a special rate of $1 = N22, and the other window at $1 = N80. The market segmentation laid the foundations for the gross abuse of the markets and which seemed to defy any practical solutions even as of today. Ojo (2005), "…the malfunctioning of the foreign exchange market has made the various attempts at determining a realistic naira exchange rate prove elusive" and contributed in no small measure towards fuelling domestic inflation. He also maintained that malfunction permitted various malpractices in the market which include: spurious purchases and disbursements without complete documentation, charging of excessive fees and commissions by the dealing banks; failure to repatriate export proceeds and non-payment of interest earned to customers that operate letters of credit and domiciliary accounts.

Table 1: Average Exchange Rates, Interest Rates and Consumer Price Indices for Nigeria & US

Pre-SAP 1970-79	0.65	6709.10	4.3	n.a	3.2	4.0	6.8	15.9	0.7	30.4
Pre-SAP 1980-85	0.72	7846.26	8.0	n.a	7.2	8.3	9.4	18.0	2.2	56.2
Post-SAP 1986-93	9.70	1201.00	16.1	20.4	15.7	15.6	20.3	27.8	8.9	73.8
Refms Leth.1994-19	21.91	240.17	13.5	12.4	11.4	8.7	19.3	36.0	66.0	90.7
Pre-Soludo 1999-20(	115.44	93.90	17.3	16.5	14.1	5.0	21.6	12.9	129.2	103.4
Soludo 2004	132.58	107.74	15.0	14.3	13.7	4.4	19.2	17.6	176.1	109.7
Post Soludo 2005	131.27	123.81	13.0	8.6	10.5	3.6	18.0	15.0	227.1	112.9
Post-Soludo 2006	127.46	133.03	13.7	11.2	9.6	3.1	16.8	12.8	392.0	
Source: Computed from IFS, CBN and National Bureau of Statistics Data base.										

With the advent of civilian democracy in Nigeria in 1999, there was an apparent return to the path of economic reforms again. Although for the first two years of this period, the basic framework for foreign exchange management continued to focus on periodic changes in the rules of the inter-bank foreign Exchange Market (IFEM), by July 2002, the Dutch Auction System (DAS) which was jettisoned in 1992 for leading to rapid exchange

rate devaluation was re-introduced. The DAS has remained in operation up till today, even in the Soludo era.

In terms of incentive structures, Table 1 shows that the Naira was highly over valued in pre-SAP era, while rapid depreciation in a post SAP era narrowed the gap between the nominal and real effective exchange rates with an equilibrium attained in pre-Soludo era. Subsequently, continuous depreciation resulted in undervaluation of the Naira that was only corrected in Soludo's era. Many economic analysts believed that DAS has resulted in a nebulous exchange rate structure and has fostered abuses. Ojo (2005) supports the view that DAS is at the root cause of the problem of continuous depreciation and multiplicity of exchange rates within the economy, which hitherto, resulted in the entrenched speculation and arbitrage by the banking sector. Among the malpractices which he identified are: "spurious bidding by authorized dealers in line with their penchant to channel almost all resources to foreign exchange bidding to guarantee successful bids. This will, in turn, lead to a drying up of loanable funds and consequent return to higher and rising interest rates".

Monetary Control Techniques and Interest Rates Structure Prior to SAP and immediate post SAP, monetary management relied on direct controls of reserves and interest rate structure of the banks. However, in 1993, an important reform of the monetary management strategies was the introduction of open market operations (OMO). OMO became the dominant instrument on liquidity management complimented by reserve requirements and discount window operations. Unfortunately, the new approach was yet to find its footing when macroeconomic management returned to an era of regulation by 1994-1998.

Irrespective of the market fundamentals, the monetary authorities pegged minimum rediscount rates at 13.5 per cent, as well as specified interest rates limits to not more than 21 percent for lending rates, while the spread between savings and lending rates was expected not be more than 7.5 per cent. As it turned, the introduction of OMO followed by a return to interest rates control opened up another investment portfolio to the commercial banks. This manifested mainly in the new opportunity offered the saving public to diversify their portfolio investments from traditional savings and the stock markets into money markets. The banks were also offered the opportunity to diversify from traditional credit purveys, and foreign exchange markets transactions to trading in money market instruments especially treasury bills and repos transactions at the OMO. Table 1 shows that the yield rates on OMO and treasury bill transactions were comparatively more attractive than savings rate, while the alternative investment portfolio which would require borrowing to meet working capital

requirements were priced out of the profitability threshold of the investing public. While the low savings rate encouraged holders of idle cash balances to invest in money market instruments, it also encouraged financial institutions to shy away from the riskier lending portfolio and its associated high transaction costs to the relatively safe portfolio with little or no costs, with the guarantee of very good returns.

In the face of credit apathy, financial sector operators found investment in foreign exchange and public debt instruments especially treasury bills very lucrative as the returns on them moved in tandem with the MRR. Thus, the policy created a dilemma in the form of trade-off costs reflected in the arbitrage gains for speculators in the financial markets. Ironically, rather than serve as a penalty rate for borrowing from the central bank, the attractive treasury bill rate which followed the rise in MRR, saw the central bank borrowing from the banks and the public as part of its monetary control function. Such funds were sterilized but which upon maturity the central bank was duty bound to pay the interest rate accruing, probably via the creation of high powered money with adverse implications for inflation control. One may argue that if the CBN issued the debt instruments in favor of the government that the burden of debt service should be borne by it. Unfortunately, during this period, fiscal authorities were known to resort to ways and means advances far above the permissible limits, and which were usually written off at the end of the day.

The changes in the structure of treasury bills holdings attested to this. Prior to the commencement of SAP, CBN accounted for a significant proportion of the treasury bills outstanding. However, with the sharp rise in treasury bill rate, the situation changed, with the deposit money banks and the public now accounting for the major share. The shift in the investment portfolio of the banks to this segment of the markets is quite rational. Indeed, the banks ceased the opportunity of the permissive financial operating environment to mobilize funds cheap, and invest in relatively secure instruments.

Also, their liability structure attested to this. The main sources of funding are demand deposits, time, savings and foreign deposits, central government deposit reserve accounts and unclassified liabilities. While the costs of funds from demand deposits, reserve accounts, and central government deposits is known to be very low, that of savings deposits has also been seen to be low in recent time. Indeed, less than 30 per cent of their funds are mobilized from the more expensive sources. The point to be made is that a significant proportion of their investible funds are sourced cheap, but are channeled into securities portfolios (money market instruments).

One is not surprised that since 1999 that the financial institutions that survived the distress emerged to become very sound and have had an outstanding record of profitability, derived mainly from the defective interest rate structures.

Theoretical Consideration

From the previous studies, it was argued that when tradables are affected disproportionately by preexisting distortions, real exchange rate depreciation can be good for growth. We now develop a simple model to illustrate the mechanics behind this. We shall consider an economy in which there exist "taxes" on both traded and non-traded sectors that drive wedge between private and social marginal benefits. When the tax on tradable is larger (ad-valoren terms) than the tax on non-tradables, the economy's resources are mis-allocated, the tradable sector is too small, and the growth rate is sub-optimal. Under these circumstances real exchange rate depreciations have a growth-promoting effect.

Consumption and Growth

Consumers consume a single final good, which we shall see below is produced using a combination of traded and non-traded inputs. Their intertemporal utility function is time separable and logarithmic, and takes the form

$$u = \int \ln c_t e^{-pt} dt \qquad (1)$$

Where c_t is consumption at time t and p is the discount rate. Maximizing this subject to an intertemporal budget constraint yields the familiar growth equation.

$$\text{L}\ \frac{c_t}{c_t} = r_t - \rho \qquad (2)$$

where r is the real interest rate (or the marginal product of capital). The economy's growth is increasing at the rate of return to capital (r), which is the feature that we will exploit in the rest of this section.

Production

We assume that the economy produces the single final good using traded and non-traded goods as the sole inputs (yT and yN respectively). The production function for the final good (y) is a Cobb-Douglas aggregate of these two inputs. In addition, in order to allow for endogenous growth (while maintaining perfect competition throughout), we assume that capital produces external economies in the production of the final good. With these assumptions, the production function of the representative final good producer can be written as follows:

$$y = \bar{k}^{1-\phi} y_T^{\alpha} y_N^{1-\alpha} \qquad (3)$$

Where $\bar{k}$ is the economy's capital stock at any point in time (treated as exogenous by each final-goods producer), and α and 1-α are the shares of traded and non-traded goods, respectively, int he production costs of the final good (1<α<0). For convenience we choose the exponent on $\bar{k}$ to be a parameter (1-ϕ) that will make aggregate output linear in capital-as we will shortly and which therefore considerably simplifies the comparative dynamics of the model. I have also omitted time subscripts for ease of notation.

Trade and non-traded goods are in turn produced using capital alone and under decreasing returns to scale. These production functions take the following simple form

$$qT = A_T kT^{\phi} = A_T (\theta_T \bar{k})^{\phi} \quad (4)$$

$$qN = A_N k_N^{\phi} = A_N ((1-\theta_T)\bar{k})^{\phi} \quad (5)$$

Where k_T and k_N denotes the capital stock employed in traded and non traded sectors. θ_T is the share of total capital employed in tradables, and $0 < \phi < 1$. To justify decreasing returns to capital in the sectoral production functions (i.e. the fact that ϕ<1), we could suppose that there are other, sector-specific factors of production employed in each sector which are fixed in supply.

By definition, non traded goods that are used as inputs in the final goods sector can only be sourced domestically. And since non-traded goods do not enter consumption directly, we have

$$qN = yN \quad (6)$$

With respect to traded goods we allow the economy to receive a transfer from the rest of the world (or to make a transfer to it). Let b stand for the magnitude of inward transfer. Then, the material balance equation in tradables is given by

$$qT + b = yT \quad (7)$$

It will be more convenient to express b as a share (γ) of the total domestic demand for tradables. That is, b = γyT. The equality between demand and supply in tradables then becomes

$$\frac{1}{1-\gamma} qT = yT \quad (8)$$

When the economy makes an outward transfer, γ will be negative we will use γ as a shifter that alters the equilibrium value of the real exchange rate. Using equation (4) – (8), the aggregate production function can be expressed as

$$r = (1-\gamma)^{-\alpha} A_T^{\alpha} A_N^{1-\alpha} \theta_T^{\alpha\phi} (1-\theta_T)^{(1-\alpha)\phi} \bar{k} \qquad (9)$$

Net output defined as $\bar{y}$, differs from gross output in so far as the economy makes a payment to the rest of the wor (d for the transfer b(or receives a payment from it if b is negative). We express this payment in general form, assuming that it is a share σ of the transfer's contribution to gross output i.e. σ x (∂y/∂b) x b =σ x (∂y/$\partial$$y_T$) x γ$y_T$ = σ x (α/yT) y x γy_T = σαγy. Net output $\bar{y}$ equals y - σαγy = (1-σαγ)y. Therefore, using (9)

$$r = (1-\sigma\alpha\gamma)(1-\gamma)^{-\alpha} A_T^{\alpha} A_N^{1-\alpha} \theta_T^{\alpha\phi} (1-\theta_T)^{(1-\alpha)\phi} \bar{k} \qquad (10)$$

This way of expressing the payment for the transfer allows a wide variety of scenarios. The transfer's contribution to net output is maximized when σ=0, that is when b is a pure transfer (a grant). The contribution becomes smaller as σ increases. Note that the production function ends up being of the Ak type i.e. linear in capital. This gives us an endogenous model with no transitional dynamics. The (net) marginal product of capital (r) is $\partial \bar{y} / \partial$, or

$$r = (1-\sigma\alpha\gamma)(1-\gamma)^{-\alpha} A_T^{\alpha} A_N^{1-\alpha} \theta_T^{\alpha\phi} (1-\theta_T)^{(1-\alpha)\phi} \qquad (11)$$

Which is independent of the capital stock, but depends on the allocation of capital between tradables and non-tradables and non-tradables, θ_T (as well as on the net value of the transfer from abroad).

Since the economy's growth rate will depend on r, it is important to know how r depends precisely on θ_T. Log-differentiating this expression with respect to θ_T, we get

$$\frac{d \ln r}{d\theta_T} \alpha \left[\left(\frac{\alpha}{\theta_T} \right) - \left(\frac{1-\alpha}{1-\theta_T} \right) \right]$$

with

$$\frac{d \ln r}{d\theta_T} = 0 \Leftrightarrow \theta_T = \alpha$$

In other words, the return to capital is maximized when the share of the capital stock that the economy allocated to tradables (θ_T) is exactly equal to the input share of tradables in final production (α).

Model Specification

To successfully examine the causative factors in exchange rate behaviors and its impact on the growth of Nigerian Economy and in line with the above theoretical framework, we now specify the model below.

GDP = f(EX, INF, FER, INTR, MS, BoP, PM)

Equation (1) is a model of growth of Nigeria Economy which states that Gross Domestic Product in the non linear form is determined by seven variables. We may transform the equation into a log-linear expression to facilitate estimation, introduce lagged variables to indicate that the model is in a continuous process of adjustment and finally we incorporate an error term which is commonly called econometric models given that by their nature. They are non-deterministic the model can therefore be re-stated as follows

$lnGDP=lnA + alnEX + blnINF + clnFER + dlnINTR + lnEMS + ln\ RM + lnGPM + FGDP_{(-1)} + U(z)$

Variables Definition

GDP= Gross Domestic Product

EX= Exchange Rate

INF = Inflation Rate

FER = Foreign Exchange Reserve

INTR = Interest Rate

MS= Money Supply

BOP= Balance of Payment

PM = Propensity to import

Analysis And Presentation Of Results

Table 2.1 Unit root test for variables in levels

Variables	Untrended	Trended
LGDP	1.956568	-2.053431
EX	1.8725	-1.95625
INF	-2.221540	-2.263249
INTR	-2.5664865	-2.5326110
LMS	-0.82.4171	2.3145022
LBOP	-1.562881	1.218628
LPM	-2.25008	-2.198838
FER	-1.348129	1.193838

Mckinnon critical value for respectively of hypothesis of a unit root at 5% - 2.8806 Trended and 3.4403 for untended formulated from the table, it is obvious that none of the variables is stationary in levels. Therefore, we proceed to unit of the variables at first difference.

Table 2.2 Unit Root Test at first difference

Variables	Untrended	Trended
ΔLGDP	-4.959304	-5.059079
ΔEX	-4.87253	-5.03456
ΔINF	-4.97248	-5.134229
ΔINTR	-8.453799	-8.466849
ΔLMS	-4.034007	-4.081913
ΔLBOP	-5.733820	-5.788950
ΔLPM	-6.853816	-7.056206

Mckinon critical values for resection of the hypothesis of a unit root at 5% level of significance -2.8807 untrended -3.4403.

From the table 2.2 after taking the first differences all variables became stationary. Therefore, we can conclude that all the variables in our cointegration regression are first differentiated stationary. That each series is characterized as integrated of order 1 (1).

Cointegration Test Results

Following our findings in table 2.2 that all variable of interest are of 1(1) we therefore test for possible cointegration among these variables.

Table 2.3: Lags Interval 1 to 4

Eigen Value	**Likelihood Ratio**	**5% Critical value**	**1 Percent Critical Value**	**Hypothetized No. of CE(5)**
0.338937	206.6476	156.00	168.36	None
0.290088	144.1478	124.24	133.57	Atmost 1
0.187399	92.41312	94.15	103.18	Atmost 2
0.160190	60.98535	68.52	76.07	Atmost 3
0.0989607	34.62391	47.21	54.46	Atmost 4
0.094160	18.94798	29.68	35.65	Atmost 5
0.24309	4.015127	15.41	20.04	Atmost 6
0.001979	0.299035	3.76	6.65	Atmost 7

The above cointegration result clearly reject the null hypothesis of no con-integration in favour at least two cointegrating relationship.

Parsimonious Error Correction

Variables	Coefficient	Std. Error	E-Statistic	Prob.
C	0.075148	0.038792	1.937216	0.0548
D(GDP)(1)	-0.276175	0.102329	-2,69888	0.00781
D(GDP)(-2)	-0.151275	0.0085277	-1.773917	0.0783
D(EX(-1)	-0.018558	0.0200 45	-0.925787	0.0894
D(EX(-2)	-0.013694	0.014801	-0.691598	0.0568
D(INF)(-1)	0.069453	0.066070	1.051203	0.0478
D(INF)(-2)	-0.114472	0.067385	-1.693782	0.0917
D(INF)(-3)	-0.011531	0.032474	-0.355064	0.0789
D(FR)(-1)	0.011341	0.015607	0.219762	0.08264
D(FR)(-3)	-0.072426	0.045937	-1.576640	0.0623
D(BOP)(-2)	-0.051334	0.68932	-0.744709	0.04577
D(LMS)(-1)	-0.251407	0.249975	-1.007744	0.03154
D(LMS)(-3)	0.228318	0.223653	1.020857	0.0628
D(ITR) (-2)	0.005387	0.039688	0.135740	0.08922
D(PM)	0.023219	0.042017	0.552615	0.05814
ECM(-1)	-0.76456	0.108298	-5.245047	0.00000

R-Square	0.76452	Mean dependent Var	0.046853
Adjusted R.Square	0.68478	S.D Dependent Var.	0.539578
S.E of regression	0.745346	Akalke info criterion	1.228089
Sum Sqaure resid	40.4269	Schwaz criterion	1.547801q
Log Likehood	76.72078	F. Statistics	7.092474
Durbin-Watson Start	2.058550	Propb(F-Statistics)	0.00000

An analysis of the results shows that the estimated equations were largely satisfactory both in terms of the sign and statistical significance of the explanatory variables. However, judging from the coefficients of determinations in the model, all the explanatory variable are determinants of the causative factors in exchange rate behavior and its impact on the growth of Nigerian Economy.

Conclusion And Policy Implications

The objective of this paper is to consider the impact of exchange rate behavior on the growth of Nigerian Economy. From the above results, the poorly managed exchange rate in Nigeria has really affected the growth of the Nigerian Economy during the study period. It was observed that sustained real exchange rate depreciations increase the relative profitability of investing in tradable and act in a second best fashion to alleviate the economic cost of these distortions. This speed up structural change in the direction that promoted growth. That is why episodes of undervaluation are strongly associated with higher economic growth.

Moreover, since the real exchange rate is a policy variable, government should use variety of instruments at her disposal to influence the level of real exchange rate, maintaining a more depreciated real exchange rate which requires higher saving relative to investment, or lower expenditure relative income this can be achieved via fiscal policy (a large structural surplus) incomes policy (compulsory savings schemes and pension reform) capital account management (taxation of capital account inflows liberalization of capital outflows) are required for better Economic growth.

References:

Agene, C.E (1991): “Foreign Exchange and International Trade in Nigeria” Gene Publications, Lagos.

Ahmadu H.I. and A.B Zanma (1997): “The Impact of Parallel Market on the stability of Exchange Rate: Evidence from Nigeria” NDCI Quartely, Vol. 7 (2) June.

Bosner-Neal, C. (1996). “The Impact of Parallel Market on the stability of Exchange Rates” Federal Reserve Bank of Kansas City Economic Review. First Quarter.

Dani Rodrik, (2008): The Real exchange Rate and Economic Growth.

Easterly, W.R. (1991): "The Macroeconomic of Public Sector Deficits: A case of Columbia" PRE Working Paper Series, World Bank, No. 626.

Ghei, N and M.A. Kiguel (1992): "Dual and Multiple Exchange Rate Systems in Developing Countries: Some Empirical Evidence", Pre-Working Paper Series, World Bank No. 881. Iyoha Edo and Oaikhenan (2000) the causative factors in exchange rate behaviour in Nigerian. Benin Journal of Social Sciences.

Kiguel M, and S.A. O'Connell, (1995): Parallel Exchange Rates in Developing Countries". World Bank Research Observer Vol. 16(1) September.

Ogiogio, G. (1995): "The Behaviour of Foreign Exchange Rates in Nigeria: Determinants and Market Efficiency". Final Report of an AERC Sponsored Research, AERC Nairobi.

Olukole, R.A (1992): Exchange Rates Developments in Nigeria" CBN Bullion Vol. 16 (1) January/March.

Tawose and Oloyede (2009): Distributional Effect of exchange rate on firm's performance in Nigeria Microeconomic approach. Journal of Social Studies.