FOREIGN EXCHANGE MARKET AND THE NIGERIA ECONOMY

***DR. OFURUM CLIFFORD OBIYO (ACA)**
****TORBIRA, LEZAASI LENEE**

***Department of Accounting, Faculty of Management Sciences, University of Portharcourt, Nigeria**
***Department of Finance Banking, University of Portharcourt, Nigeria.**

ABSTRACT

Prompted by the need to argue Akpan's earlier study and findings, this paper attempts to empirically examine the effect of the demand and supply of foreign exchange on the gross domestic product of the Nigerian economy over a fourteen (14) year-period (1995-2008). Employing the use of vector auto regression (VARs) models on the time series data, the result reveal that supply of foreign exchange has a positive and significant relationship with output level of Gross Domestic Product while the demand for foreign exchange has a negative relationship with gross demand product. This implies that the growth in supply of foreign exchange has resulted in an increase in the Gross Domestic Product in Nigeria. Finally, the study recommends that the determinants of the demand for foreign exchange should be analized in order to understand what occasioned the negative relationship with Gross Domestic Product.

INTRODUCTION

As the main engine of globalization, international finance relies heavily on the operations of the foreign exchange market. This operation includes the buying and selling of foreign goods, services or financing assets that leads to the exchange of domestic currency or bank deposit for foreign currency or bank deposit denominated in different currencies. Like any good or asset in a free market, the trading of currency and bank deposit denominated in particular currencies is determined by the interaction of supply and demand. Allocation efficiency is achieved when the foreign exchange market, through the interaction of the forces of demand and supply succeeds in solving financial imbalances that exists between countries. It is the role of the foreign exchange market to continue to strive and reduce trade deficit through the demand-supply mechanism. The domestic economy will feel the effect of the trading activities more positively when the Gross Domestic Product (GDP) is on the increase. The evolution of the foreign exchange market in Nigeria up to its present states was affected by the changing pattern of international trade, institutional changes in the economy and structural shifts in production. These suggest that when a country's currency appreciates (rises relative to the other currencies) due to increase in production, the country's goods abroad become more expensive and foreign goods in that country become cheaper (holding domestic prices constant in the two currencies). Conversely, when a country's currency depreciates as a result of decrease in production, its goods abroad become cheaper and foreign goods in that country become more expensive. Appreciation of a currency can make it harder for domestic manufacturers to sell their goods abroad and can increase the competition at home from foreign goods because they cost less.

To perform its trading function optimally, the foreign exchange market must impact the economy appropriately to cause an increase in production. Two market activities: Demand and supply of foreign exchange are cardinal for our purposes. The manner in which Gross Domestic Product (GDP) changes is a function of the degree of impact of the forces of demand and supply.

Gross Domestic Product is employed as proxy for economic growth in this study. It is conceptualized as the total monetary value of all goods and services produced in an economy over a specific period of time, usually one year. For the purpose of this paper, we are concerned with the interaction of the forces of demand and supply in the foreign exchange market that brings about corresponding impact on the economy.

By definition, the foreign exchange market is organized as an over-the-counter market in which several dealers (banks, companies and government) stand ready to buy and sell deposits denominated in foreign currencies. (Mishkin, 1997). In order to chart future paths for the Nigeria economy's responses to the activities of the foreign exchange market, it is essential to first find out it responses in the past. It is necessary however, to determine the effect of important foreign exchange market indicators such as the demand for and supply of foreign exchange on the Gross Domestic Product of the Nigeria economy. (Mishkin, 1997).

Previous studies have attempted to demonstrate that the activities of the foreign exchange market influence the economic growth of Nigeria. In this context, economic growth is defined as a sustained rise in the output of goods, services and financial assets with the sole purpose of improving the economic and financial welfare of the citizens.

While they appear to agree on the significant effect of foreign exchange market activities, there seems to be disagreement in the relative effects on production. For instance, in Akpan's (2009) study, only exchange rate (EXCHR) representing the foreign exchange market in Nigeria was discovered to exert significant influence on the economics growth. Other factors such as labour force and technology were not found to statistically affect economic growth. Unique in its approach, this study seek to focus on the critical response of Gross Domestic Product (GDP) to stimuli provided by the activities of the foreign exchange market in Nigeria. The point of departure is to determine the relationships between the demand and supply of foreign exchange (foreign exchange market operation) and the Gross Domestic Product (economic growth indicator). Finally, the paper attempts to answer the question of whether or not foreign exchange market activities significantly and positively affect the economy.

LITERATURE REVIEW

Several studies have been conduced on the efficiency of foreign exchange market operations in predicting economic growth. According to Nnamdi, (2009), trading offers opportunities for international exchange of commodities and services. This tends to boost national economic growth when it is appreciably driven by relative advantages arising from the factor endowments prevailing in the producing regions and economies. From this premise, the foreign exchange process offers nations the opportunity to produce goods for wider markets and consequently realize higher prices compared to the prevailing domestic prices for goods and services. Greater opportunities also exist because the same country could take advantage of trade to import at lower prices, goods which under normal circumstances would attract higher prices if produced locally, Nnamdi, (2009). Jhingan (2008) opine that even for emerging economies like Nigeria which produces more of raw materials, efforts to export these products tend to widen their markets. As such, existing resources are employed more productively and resources allocation becomes more efficient with attendant appreciable increase in domestic investment.

In a study of China, Malaysia, Thailand, Brazil, Chile, Taiwan, Singapore and South Korea, Todaro and Smith (2009) demonstrated that trade can serve as an important stimulus to rapid economic growth. They stated that: "Access to the markets of developed nations (bent on export promotion) can provide an important stimulus for the greater utilization of idle human and capital resources. Expanded foreign exchange earnings through improved export performances also provide the wherewithal by which less developed countries can augment their scarce physical and financial resources. In short, where opportunities for profitable exchange arise, foreign trade can provide an important stimulus to aggregate economic growth".

Sadan's (2005) tested for validity of exchange rate determination for 17 countries using Johanson co-interaction methodology and Larsson et al panel co-integration technique. He observed a significant relationship between exchange rate and most determining variables. Ogawa and Kawasaki (2003) and Cloudhry (2005) utilized and generalized the foreign exchange rate theory to explain the non-man reverting behaviour of real exchange rates in East Asia. They found that the real exchange rate will share common trends if fundamental variables are sufficiently interrelated. Krichene (1998) studied the exchange rate determination and price interdependence in five African

countries. He employed monthly data of bilateral real exchange rate for the period from 1979 to 1996. The finding of the study was that bilateral real exchange rates revert to long-term equilibrium. Smith and Wickens (1986) analyzed possible reason why the monetary model fails to test a random walk hypothesis for the exchange rate in a paper, "An Empirical Investigation into the Cause of Failure of the Monetary Model for Exchange Rate" for the period of 1973-1982. Frankel (1982) added real financial wealth, which is stock, as financial variable in the money demand function into both flexible price and sticky price version of his paper, "The Mystery of the Multiplying Marks: A Modification of the Monetary model." Auwal Umar and Hamzat Soliu used distributed lag model to show whether or not foreign exchange rate in Nigeria converge or diverge from its long run equilibrium. The findings show that the exchange rate under DAS converges to long run equilibrium while it does not under international foreign exchange market (IFEM). Isard (2007) found that alignment of exchange rates in the market has a critical influence on the rate of growth of per capital output in low income countries.

Apart from those identified above, other related studies have been conducted to evaluate or examine the impact of respective foreign exchange market activities. Akpan (2009), for instance, studies the impact of exchange rate movement on economic growth and found a significant relationship between exchange rate volatility and economic growth in Nigeria. He posits that exchange rate policy should be designed to increased and sustained economic growth.

In another study that introduces more variables and slightly expanded the data make-up of exchange rate determinant (from 1970-2005) the result revealed that besides the basic macroeconomic variables like import, external reserves, inflations, and current account balance, which are acknowledged as determinants of exchange rate instability, a realistic exchange rate is capable of accelerating economic growth, reducing import and also stemming the tide of inflation in a developing economy and should be maintained. (Simeon, Inyang and Akpang; 2009). Uma (2009) attempt to ascertain whether or not foreign private investment has assisted in developing manufacturing capacity utilization in Nigeria. He found that a significant role is contributed by foreign private investors in capacity utilization in Nigeria.

METHODOLOGY

The paper construct a single trade economic growth model patterned after multivariate regression model of linear formulation. We choose this type of model in this study, since it appears to capture the prevailing activities in the foreign exchange market as well as Nigeria economic growth indicator (Gross Domestic Product) of the country of study.

For the purpose of estimation, we employ the use of vector autoregression models (VARs) to times-series annual Nigerian data denominated in Naira from 1995 through 2008. The relevant data were obtained from the statistical bulletin of the Central Bank of Nigeria, (various issues). Analyses of the estimated models are directed to determining the relative effects of the correlates. The detailed specifications of the model are done hereunder.

THE MODEL

Following the arguments in Akpan (2009) and the empirical review earlier made in this study, we can hypothesize that gross domestic product is a positive function of the demand for and supply of foreign exchange. We specify the model as follows:

Economically,

GDP = F(DFE, SFE)

Econometrically,

GDP = a + a2 DFE + a3 SFE + Ut .....(1)

Equation 1 can be used to determine the relationship existing between gross domestic product and the demand and supply of foreign exchange in Nigeria.

DATA ANALYSIS AND INTERPRETATION

This section shows the empirical analysis of this study. It entails the analysis of data on the foreign exchange market and Nigeria economy. This analysis is based on testing the basic assumptions about the relationship between foreign exchange market and Nigeria economy.

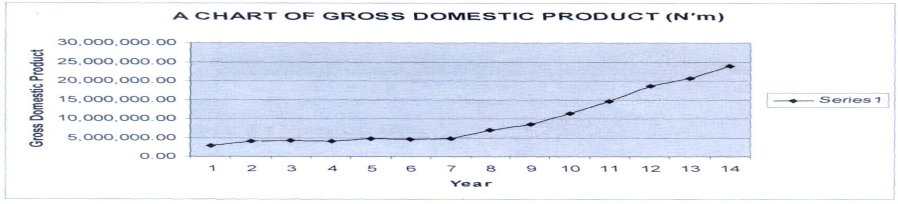
Year	Gross Domestic product	Demand Foreign Exchange	Supply Foreign Exchange
1995	2,907,358.18	4,449,118	4,357,901.40
1996	4,032,300.34	1,083,882.80	1,040,800.00
1997	4,189,249.77	4,439,647.90	4,348,295.30
1998	3,989,450.28	7,644,998.60	7,600,944.00
1999	4,679,212.05	24,090,643.90	30,863,667.20
2000	4,582,127.30	70,698,099.90	71,297,029.90
2001	4,725,086.00	85,982,047.90	84,399,404.80
2002	6,912,381.30	95,109,626.10	75,052,779.10
2003	8,487,031.60	104,213,697.00	85,657,468.30
2004	11,411,066.90	92,103,301.00	77,568,017.80
2005	14,572,239.10	61,881,093	65,690,598.40
2006	18,564,594.70	179,578.19	261,755,663.40
2007	20,657,317.70	129,530.85	180,932,982.20
2008	23,842,170.70	578,314.95	916,723,558.80

Source: **Central Bank of Nigeria, Statistical Bulletin, Various Issue.**
Source: **National Bureau of Statistics, National Account of Nigeria, Various Issues**

Annual time series data for the period of 1995-2008 are used in the present study. This study employs the use of vector autoregressive models (VARs) in examining the effectiveness of the foreign exchange market on the Nigeria economy. VARs have in recent years emerged as the most widely used technique for studying foreign exchange in both developed and developing economies. A VAR is essentially an n-equation, n-variable linear model, in which each variable is in turn explained by its own lagged values (plus current, depending on the variant of the VAR) and past values of the remaining n-1 variables. This simple framework provides a systematic way of capturing rich dynamics in multiple time series, while the statistical tool offered by VARs is easy to use and interpret.

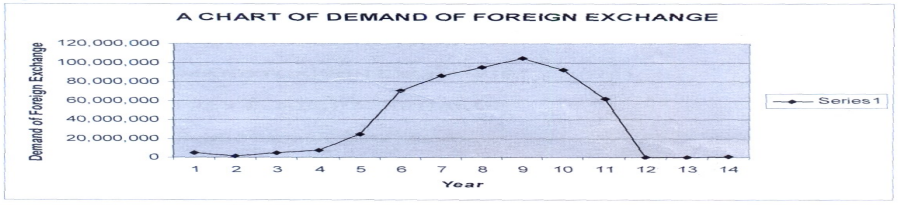
To proceed with the test, graph of each series is first visually examined to see whether a trend is present or not as shown in figure below.

Figure 1



Source: Researcher's Computation

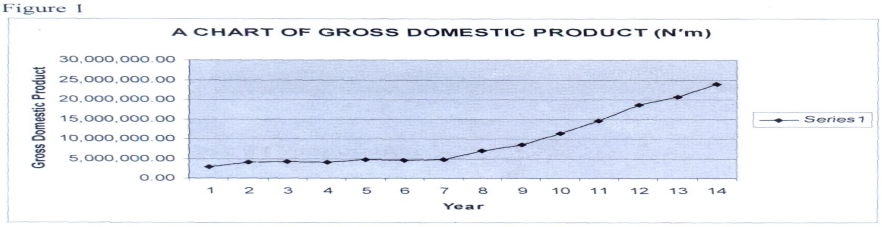
Figure 2



Source: Researcher's Computation

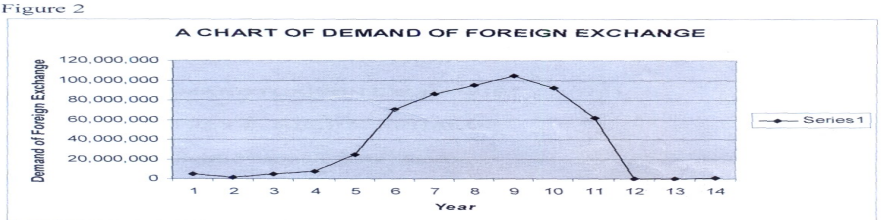
Figure 3

Figure 1



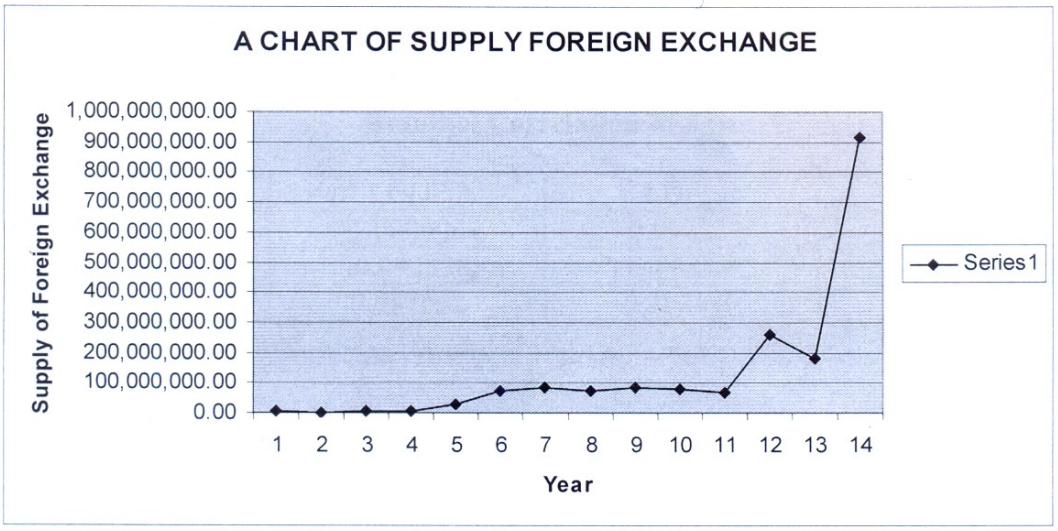
Source: Researcher's Computation

Figure 2



Source: Researcher's Computation

Figure 3



Source: Researcher's Computation

MODEL SPECIFICATION

GDP = + DFE + a3 SFE + Ut …… (1)

Where:

GDP = GROSS DOMESTIC PRODUCT
DFE = DEMAND FOREIGN EXCHANGE
SFE = SUPPLY FOREIGN EXCHANGE
Ut = Stochastic variable (error term)
A1 = Intercept
A2, a3 a4 a5= Slope

Table 2: Residual Correlation Matrix

	LGDP	LDFE	LSFE
LDGP	1.000000	-0.092338	0.087662
LDFE	-0.092338	1.000000	-0.742248
LSFE	0.087662	0.282195	1.000000

Source: **Self-computed**

The vector autoregression estimates and the multiple impulse response functions generated from the basic model, shows that the supply of foreign exchange respond positively to gross domestic product while the demand for foreign exchange shows a downwards trend to gross domestic product.

EMPIRICAL RESULTS AND DISCUSSION

The results of model estimation and the various diagnostic tests are presented below. *Equation 1* is estimated using the output level of Gross Domestic Product (GDP) as the dependent variable. The results of parameter estimate along with the standard errors, t-values and the corresponding critical values are given in the tables. The signs of all estimated coefficient are expected in the VAR model in the table. The parameters of all variables in *Table 3* are significant at 90% confidence interval.

VECTOR AUTOREGRESSION ESTIMATES (BASIC MODEL)

Vector Autoregression Estimates
Date: 18/02/10 Time: 11: 06
Sample (adjusted): 1995-2008
Included observations: 13 after adjustments
Standard errors in ( ) & t -statistics in [ ]

Variable	LGDP	LDFE	LSFE
LGDP (-1)	0.104617	0.122608	0.068902
	(10.1365)	(0.10017)	(0.16531)
LDFE (-1)	-2.354100	0.247249	0.816736
	(10.9163)	(0.10788)	(0.17803)
LSFE (-1)	1.300465	0.000548	0.001678
	(0.11038)	(0.00109)	(0.00180)
C	-12.43069	0.737580	0.019008
WAD	-1.707047	-0.048978	0.032115
R-squared	0.902356	Mean Dependent var	23.40968
Adjusted R-squared	0.874624	S.D. dependent var	16.88810
S.E. of regression	5.979385	Akaike info criterion	6.552436
Sum squared resid	2824.490	Schwarz SC	6.933687
Log likelihood	290.6883	Determinant resid (dof adj)	5.29E-06
Schwarz criterion	1.278616	Determinant resid conar	2.75E-06

In *Table 3*, demand for foreign exchange market has a downward trend relationship with output level of Gross Domestic Product. The VAR model result shows that demand for foreign exchange market is negative in relation to the growth of Nigeria economy; hence we accept the alternative hypothesis and reject the null hypothesis. Supply for foreign exchange market has a positive and significant relationship with output level of gross domestic product. The implication of this finding is that the growth in supply for foreign exchange market up to 2008 has resulted to increase in impulse response function of Gross Domestic Product in Nigeria. The co-efficient of determinant show that 90% of the total

variations in output level of gross domestic product are explained by the explanatory variables.

REFERENCES

Akpan, P.L. (2006) *Exchange Rate Volatility and Macroeconomic Performance in Nigeria* (1970-2003): An unpublished Ph.D dissertation presented to the department of economics and graduate school, University of Calarbar, Nigeria.

Akpan, P.L. (2009) *"Exchange Rate Instability and Economic Manangement of an Emerging African Economy:* A case of Nigeria". 2010 social science Electronic publishing Inc. Cross Rivers University of Technology, Calabar, Nigeria.

Akpan, P.L. (20090 "*Foreign Exchange Market and Economic Growth in an Emerging Petroleum Based Economy:* evidence from Nigeria". 2010 social science Electronic Publishing Inc. Cross Rivers University of Technology, Calabar Nigeria.

Aktar, M.A. and Hilton R. S. (1984) *"Exchange Rate Uncertainty and international Trade:* Some conceptual issues and New Estimate for Germany and United States". Federal research bank of New York, Research paper. 84 (3) 19-27.

Central Bank of Nigeria (2006), *International Operations Report:* The oreign exchange market in Nigeria.

Cushman, D.D. (1983), *The Effect of Real Exchange Rate Risk on International Trade:* Journal of International economics 15, 28-32.

Jhingan, M.L. (2008), *The Economics of Development and Planning, (39th ed), Delhi, Vrinda Publications (p) Ltd, P. 427.*

Mishkin F.S. (1997), The Economics of Money, Banking and Financial markets (5th ed), New York, Addision-Wesley Longman Inc. 165-191.

National bureau of Statistics, National Account of Nigeria, Various Issues.

Nnamdi, I.S. (2009) *A Virile Commodity Exchange and Futures market for Nigeria:* Good Intentions and Hard Realities. Department of Finance and Banking, University of Port Harcourt, Nigeria.

Tadaro, M.P. and Smith, S.C. (2009), *Economic Department,* (10th ed), New York, Addision- Wesley/Pearson Education, P. 615.