

# THE IMPACT OF EXCHANGE RATE FLUCTUATION ON CAPITAL INFLOW: THE NIGERIAN EXPERIENCE 1980 - 2003

*Dr. Unugbro, A. O.*

## **Abstract**

This paper empirically investigated the impact of exchange rate fluctuation on capital inflow to Nigeria for the period 1980-2003. From it, it was discovered that capital inflows are greatly desired and that exchange rates have shown some levels of significance in determining foreign direct investment (FDI). This effect can be detected in the manufacturing sector, which depends on and pays for imported inputs in foreign exchange. It was observed that not all the variables in the model were enough in scope to explain the effect exchange rate variations has on foreign direct investment (FDI). However, exchange rate was significant at the 1% level, thus, if the effective real exchange rate is stable, it will bring about a favourable expectation about the business climate of the nation (Bamidele and Iyoha, 1993). However, due to the inconsistencies inherent in the Ordinary Least Square (OLS) estimation model, specifically the existence of serial correlation among the explanatory variable as indicated by the value of Durbin-Watson statistics led to the use of the Cochrane-Orcutt method. The result of structural adjustment programme (SAP), met with a priori expectation signs while exchange rate and GDP were unfavoured. The results obtained were informative. In light of this, frequent policy changes and exchange strategies has implication for exchange rate and obvious consequences for sectors that depends on foreign inputs or foreign sources of capital.

## **Introduction**

The exchange rate situation in Nigeria, has been plagued by various problems in the recent past. The importance of foreign capital inflow to Nigeria, is generally perceived as something desirable. But then, capital inflows have long displayed a boom-and-burst pattern. Foreign capital inflows have been an important aspect of international trade and imports of capital goods. Foreign capital inflow contributes to a country's economic growth and development, in terms of easing the constraints of low levels of domestic savings and investment. This may have prompted many authors to be preoccupied with the determinants of capital inflows. Obadan (2004), opined that, foreign capital inflow consists of the movement of financial resources from one country to another,

This paper specifically, examined the impact of exchange rate fluctuation on capital inflow to Nigeria. It is argued that exchange rate fluctuations adversely affect capital inflow (especially to Nigeria), because Nigeria's manufacturing sector is highly dependent on the importation of inputs and capital goods. These imported inputs are paid for in foreign exchange, which is not stable. Thus, the variations in exchange rates are bound to adversely affect activities in the sector that is dependent on external sources for its productive inputs. The scope of this paper is limited to the impact exchange rate fluctuation has on capital inflow to Nigeria between 1980 and 2003.

The term "exchange rate" can be defined as the price of one country's currency in terms of another, Iyoha and Unugbro (2005), defined exchange rate as the domestic price of a unit of foreign currency. It refers to the cost of exchanging one country's currency for others. In many developing countries exchange rate issues have tended to dominate macro-economic policy discussions during the last few years. This is attributed to the amount of influence which exchange rate impacts on decisions to save and invest as well as its being a major determinant of capital inflow and external competitiveness of a country. In the pursuit of certain goals such as the achievement of balance of payments viability, the maintenance of internal payments, as well as the solutions to the problems of defining, measuring, detecting and correcting situations of real exchange rate misalignment and overvaluation, the Exchange Rate Adjustment (ERA) has been undertaken by government for a number of years (Olasadebe, 1992).

Whiting (1972), opined that, when payments for transactions in a foreign currency are to be made, or received, the rate at which the two currencies change hands will be determined in the foreign exchange, hence the market price is determined by supply and demand of foreign exchange.

### **Exchange Rate Policy in Nigeria**

The main objectives of exchange rate policy in Nigeria are to preserve the value of the domestic currency, maintain a favourable external balance without compromising the need for internal balance and the overall goal of macroeconomic stability. The place of exchange rate and its proper management within an economy cannot be overemphasized (Odozi, 1994). This is because foreign exchange consists of conversion of a country's currency for making external payments and the defense of its own security.

### **What is Capital Inflow?**

Foreign capital inflows are generally perceived as something desirable to the industrialized and developing countries. It can eliminate foreign exchange shortages, improve standard of living, deepen and broaden the financial markets. Capital inflow, has also helped individual countries to cushion shocks-either internal such as harvest failures or external such as fluctuations in commodity prices or recessions in industrial economics (Colaco, 1985).

Foreign capital inflows consists of the movement of financial resources from one country to another. Capital inflow is a broad concept which includes different kinds of financial transactions, lending by governments and international organizations; bank lending, short and long terms, investment in public or private bonds; investment in equities; and direct investment in productive capacity. Each of these has different implications for growth, on one hand, and exposure to capital market risk on the other hand. Net capital inflows arise when saving and investment are unbalanced across countries, resulting in transfer of real resources through a trade or current account imbalance. A capital-exporting country is one that obtains larger new claims on foreigners than its new liabilities. Its citizens use current savings to acquire foreign assets, and not just for domestic capital formation, while a capital-importing country is one that incurs new liabilities that are larger than its new foreign claims. It draws on foreign savings to supplement its own (Kcnen, 1992).

### **Types of Capital Inflows**

Capital inflows may be official or private. Official capital flows have their sources as foreign government and international agencies or multilateral organizations, while private capital flows emanates from private individuals, banks, companies and institutions. Generally, external capital inflows can be categorized into three:

1. *Official Development finance (ODD)*: This contains two aspects, official development assistance (ODA) and Official Development Flows (ODF). ODA consist of official grants or loans with acceptable grant elements from agencies of government or multilateral institution to support economic development or welfare objectives. While ODF are loans from official lender, (government or multilateral agencies).
2. *Export Credits*: These are credits designed to finance specific purchases of goods and services. They are commercial credits in that they have their origin in the transfer of goods when the exporters and the importers agree to postpone payment to a future date.
3. *Foreign Private Flows*: This comprises of international bank loans and bond issues, private export credit, foreign private direct investment and portfolio investment.

### **The Relationship Between Exchange Rate and Capital Inflow**

In order to increase the flow of capital to Nigeria, rigorous policy measures are being pursued with the aim of stabilizing Nigeria's exchange rate and reducing over-valuation of the naira. This became necessary in order to facilitate capital flows, especially from foreign sources (whether foreign direct or foreign private investment).

The need for external capital inflow arise when desired investment exceed actual savings and also due to investment with long gestation periods that generate non-monetary returns. Hence, foreign sources of capital became an essential ingredient in boosting domestic investment. However, Onuigbo (1994), opined that, over valuation of the naira tended to undervalue foreign exchange inflows in terms of the naira. Consequently, he fore the introduction of the various exchange rate reform measures, foreign investors required a higher amount of foreign exchange to finance their local productions.

Akanji (1999), stated that, inconsistency of foreign exchange policy and management affected private sector investment. The fluctuating naira exchange rate produced adequate planning for investment while the large swing in depreciation affected cost of production. In addition, Oke (1999), said that, appreciation of the exchange rate officially cheapens imported raw materials, thereby further retarding private investment.

Essien and Onwioduokit (1999), stated that, a set of determinants of capital inflows to developing countries is global-push-factor such as interest rate, stable exchange rate and labour market conditions. Serven and Salimano (1992), noted that, monetary, fiscal and exchange rate policies directed at correcting unsustainable macroeconomic imbalances also affect private capital flow. Essien and Onwioduokit (1999), stated that, exchange rate stability in the country is necessary for attracting foreign investment.

Obadan (1994), also opined (hat, high inflation rate reduces international competitiveness of exports, foreign exchange earnings and put pressure on current account and exchange rates. He further, traced the importance of exchange rate on capital inflow of foreign private investment and noted that its importance as the centrepiece of the investment environment derives from the argument that, a sustained exchange rate misalignment in terms of over-valuation or under valuation is a major source of macroeconomics disequilibria, which spells danger for foreign direct investment.

The exchange control Acts of 1962, was aimed at making the investment more conducive for foreign investors (Solako and Adebuisuyi, 2001). However, (his measure is observed not to have yielded the desired result in terms of attracting EDI inflows. For instance, aggregate FDI inflow into Nigeria through existing foreign jointly owned companies during the 1970's averages, 562.3 million yearly in nominal terms. As a proportion of GDP, it accounted for 3.6% during the period. Before the introduction of SAP in 1986, total foreign investment inflow for 1980-1985 averaged, 8,178.2 million yearly and represented 4.3% of GDP. During the period 1987-1990, foreign inflow rose to 8,183.6 million, representing 3.0% of GDP, while the average inflow from 1991-1998 was 15,402 million or 1.4% of GDP.

Osakwe (1999), stated that, the effects of the naira depreciation on sectoral investment are more devastating than that of inflation. Nigeria has since 1986 witnessed a sharp and persistent depreciation of the naira vis-a-vis the U.S. dollar and other world major currencies. He observed that, depreciation of the naira had eroded the values of all capital investment. This is evident, in the fact that, nearly all investments in dollar recorded significant negative growth rates and actual investments were in continuous decline. Depreciation triggers unwarranted monetary expansion through the CBN monetization of foreign exchange earnings at depreciated rates.

Prior to 1986, (SAP era) a devaluation of the U.S. dollar was followed by a matching devaluation of the naira in order to maintain the existing naira/dollar exchange rate. Central Bank set a currency basket of Nigeria's major trading partners of the U.S., the U.K., Japan, France, Germany, Switzerland and the Netherlands believing (hat (his was (he best approach at minimizing exchange rate instability as well as improving capital inflows especially from these countries.

In conclusion, some authors have argued that frequent exchange rate changes create uncertainties about future returns on investment. Hence, macro anti non-macroeconomic variables like inflation, unemployment, declining investment portfolio as well as political instability need to be curtailed by means of public sector deficit reduction and a proper or full-scale democratization of the Nigerian economy. This will open the economy to capital inflows, thereby improving the country's international competitiveness amongst it's trading partners and reduce exchange rate depreciation as well as trigger-off an improved stable investment opportunities, both internally and externally.

### **Theoretical Frame Work and Model Specification**

Exchange rate is a veritable instrument of economic management and an important macro-economic indicator used to assess the overall performance of all economy (Ono, 1998). Foreign capital inflows consist of the movement of financial resources from one country to another (Obadan. 1999).

Foreign capital in Mow is considered to be a good thing and an indicator of success, reflecting a record of prudent macroeconomic management. Much discussion is taking place on how to increase the gains anti avoid excess disequilibria resulting from the foreign capital inflows. A large number of countries need to find discretionary ways to channel external flows to fixed capital investments in order to raise the rate of investment. Due to the highly volatile nature of capital inflows, it is difficult to formulate a model that can actually capture the impact which fluctuations in exchange rates has on capital inflow to Nigeria.

Inflows of foreign direct investment to Nigeria rose to \$4786.4million in 1980, from \$\*23 1.0

million in 1970. It declined to \$41,423.5 million in 1985, from \$42,193.4 million in 1982. At the inception of SAP (Structural Adjustment Programme) it rose again, to \$44,024.0 in 1986, and in 1991 it was at its peak with \$45,999.3 billion. The substantial exchange rate regime was one of the factors that accounted for its observed increase during that period. The inflows of FDI fell drastically to \$45,672.9 million in 1996, stabilized at N32,434.5 million in 1998 and declined to \$413,531.2 million in 2003. Inflows of foreign direct investment have exhibited notable fluctuations since 1970 to date. (2003). The low level of FDI in Nigeria has been attributed to number of factors, among which macroeconomic instability, as evidenced by rising inflation, interest and exchange rate volatility, arising from fiscal dominance (Central Bank of Nigeria, 2001:64).

### **Determinants of Foreign Direct Investment**

Foreign direct investment can be determined theoretical or empirically. At the theoretical level, factors that determine FDI flows are:

- i. Differential Returns Hypothesis which emphasizes the role of inter-country differences in rate of return in determining the flow of FDI.
- ii. Investment Climate Hypothesis where increases in FDI flows are associated with improvement in the investment climate.
- iii. Need-for-Raw-Materials Hypothesis, which is particularly relevant to FDI in developing countries like Nigeria.
- iv. Size-of-Market Hypothesis, which emphasizes that, the size of the market determines the intensity of the demand for the output produced by foreign capital.
- v. Growth Hypothesis, which emanates from the relation between the level of aggregate demand and the stock of capital required to satisfy it.

At the empirical level, an econometric study was carried out by Obadan (1982) and his analysis showed that, the size of the market is a positive factor in attracting FDI. This was later confirmed by Anyanwu (1993). In a recent study on the main determinants of FDI in Nigeria, Iyoha (2001), used econometric techniques to explore the effects of economic size, a strong positive factor in attracting FDI into Nigeria.

### **Model Specification**

The model, which was used in this paper in determining the impact of exchange rate fluctuation on capital inflow to Nigeria, is specified below:

$$FDI = f(EXRAT, INFRAT, GDP, DSAP)$$

The model will take the form:

$$FDI = b_0 + b_1 EXRAT + b_2 INFRAT + b_3 GDP + b_4 DSAP + U_M \text{ Where:}$$

FDP	=	Foreign Direct Investment
EXRAT	=	Exchange Rate
INFRAT	=	Inflation Rate
GDP	=	Gross Domestic Product
DSAP	=	Dummy Variable Capturing SAP

Data used for the model are obtained from the Central Bank of Nigeria (CBN) Annual Reports and Statement of account and from the Federal Office of Statistics (FOS).

The techniques used for the analysis is to critically examine the impact of exchange rate fluctuation on capital inflow to Nigeria,

On account of lack of consistent real series, nominal measures of the variables in the specification were used in the estimation of the model. The results obtained are presented below.

### Presentations, Interpretation and Analysis of Results

In this section, the regression results, which were obtained with the model specified earlier is reported. The model took the form:

$$FDI = f(\text{EXRAT}, \text{INFRAT}, \text{GDP}, \text{DSAP}).$$

The period covered is 19X0 - 2003. The model was estimated using the Ordinary Least Square (OLS) regression technique. However, because of the inadequacies inherent in the OLS mode! used, especially the existence of serial correlation among the explanatory variables as indicated by the value of the Durbin-Watson, the Cochrane-Orcutt (forth-order auto regressive) method was made use of. The empirical result obtained is presented in the table below:

**The Ordinary Least Square (OLS)**

Regressor	Coefficient	Standard	T -Ratio	Prob
INPT	9X82.7	10790	0.9	0.37
GDP	-0.08	0.13	-0.61	0.55
EXTRA	1423.6	76.35	18.64	0.00
INFRAT	12.13	135.32	0.09	0.93
DSAP	7823	7759.3	1.01	0.33

$$R^2 = 0.97$$

$$-R^2 = 0.96$$

$$F^* = f(4, 19) = 151.18$$

$$\text{S.E of Regression} = 131.174$$

$$\text{Mean of dependent Variable} = -66405.9$$

$$\text{D. W - Statistics} = 1.13$$

With 24 observations, using the OLS regression, the researcher regressed foreign direct investment (FDI) on four (4) explanatory variables (EXRAT, INFRAT, GDP and DSAP).

From the coefficient of determination ( $-R^2$ ) obtained, it can be concluded that the four (4) regressors in the equation explained 0.97 or about 97% of the systematic variations in FDI during the period 1980 - 2003. This is complemented by the adjusted  $R^2$ , which stood at 0.96 or about 96%. This implies or reveals the overall goodness of fit of the model. The remaining 3% of the  $R^2$ , which is not explained, is due to error term.

The f-value of 151.18 is highly significant, easily passing the significant test at the one percent level, since its value is greater than the table value of 4.5. 'Finis, there is no doubt that there exist a significant linear relationship between FDI and the dependent variables.

Exchange rate is significant at the 1% level but shows a positive relationship with the dependent variable (FDI). Hence, a one percent (1%) increases in exchange rate will trigger-off 1423.6% increase in

FDI. The major reason for this pervasive sign may be due to the fact that GDP is positively related to foreign direct investment (FDI) and an increase in exchange rate leads to increase in GDP, because increases in exchange rate discourages imports and encourages exports. Hence, exchange rate indirectly influences FDI via GDP.

Inflation rate and GDP did not meet the apriori expectation signs and they are not also significant. A 1% increase in inflation rate will lead to a 12.13% increase in FDI. While a 1% increase in GDP will decrease FDI by 0.08%. The reason for this abnormality may be attributable to weak policies adopted in the country. The dummy variable, which was used to capture the effect of SAP, shows a positive relationship with FDI. Hence, there was a significant effect of SAP on FDI during the period under review.

The insignificance of GDP and inflation rate shows that their coefficient estimates are not significantly different from zero while in the case of the dummy variable and exchange rate; their coefficient estimates are significantly different from zero. Although, the value of the S.E. of

regression is high, its ratio to the mean of dependent variable of 0.2 is relatively low, showing a high predictive power of the model.

A look at the Durbin-Watson statistics indicates that, we neither accept nor reject the assumption of serial correlation as the D.W value of 1.13 falls within the gray region.

A better result was obtained by the assumption of a fourth order-autoregressive-scheme, using the Cochrane-Orcutt method. The final econometric results are presented in the table below:

## 2. The Cochrane-Orcutt Method

Regressor	Coefficient	Standard Error	T-Ratio	Prob
INPT	45839.6	88458.0	0.52	0.61
GDP	-0.06	0.11	-0.55	0.59
EXTRA	1164.5	378.36	3.08	0.01
INFRAT	-119.46	176.84	-0.68	0.51
DSAP	1226.2	15602.7	0.08	0.94

$$R^2 = 0.98$$

$$-R^2 = 0.96$$

$$F^* = f(8, 11) = 61.13$$

$$S.E \text{ of Regression } 13343.6$$

$$\text{Mean of dependent Variable } T \ 66405.9$$

$$D.W - \text{Statistics } 2.0$$

$$U = 0.88 * U_{-1} - 0.28 * U_{-2} - 0.09 * U_{-3} + 0.35 * U_{-4} + E$$

Using the Cochrane-Orcutt method, the coefficient of determination ( $R^2$ ) of 0.98 indicates that the variables in the model explain about 98% of the variations in FDI. This is also supported by the adjusted R-squared ( $-R^2$ ) whose value is 0.96 accounting for about 96%.

The value of the F-statistics (61.13) indicates that the model fit the data relatively well. It passed the significant test at the 1% level, establishing a linear relationship between FDI and the independent variable (EXRAT, INFRAT, GDP and DSAP).

The a priori expectations were in favour of inflation rate and the dummy variable used to capture SAP, but did not favour GDP and exchange rate. Hence, while a 1% increase in GDP leads to about 0.06% decrease in FD), a 1% increase in exchange rate leads to about 1164.5% increase in FDI. The reasons for the abnormalities in signs have already been explained earlier in the First result. Also, a 1% increase in inflation rate leads to about 119.46% decrease in FDI. These findings seem to conform to Iyoha (1999) claim that uncertainty and instability proxied by inflation act to discourage foreign investment in Nigeria. The impact of the dummy variable, which captured SAP, was also established as it affected FDI positively during the period under review although the effect is weak. For their individual significance, while exchange rate is significant at the 1% level, the other coefficient estimates are not significantly different from zero. This shows that, they have weak effects on the variations in FDI to Nigeria.

A look at the Durbin Watson (D.W) statistics shows that, the serial correlation has been eliminated. This is proven by the value of the D.W-statistics of 2.0, which falls within the acceptance region of the Durbin-Watson table. The S.E of Regression is relatively high at 13343.6, but its ratio to the mean of dependent variable (66405.9), which is 0.2, is relatively low, showing a high predictive power of the model.

Finally, the parameters of the fourth-order-autoregressive scheme  $U(-1)$  and  $U(-4)$  are significant under 10% and 50% level respectively.  $U(-2)$  and  $U(-3)$  are not significantly different from zero.

## Conclusion

This paper empirically investigated the impact of exchange rate fluctuation on capital inflow to Nigeria for the period 1980–2003. For a developing country like Nigeria whose major source of income is foreign exchange derived from trade and whose major sectors (e.g. manufacturing) depends on foreign inputs and foreign sources of capital, it becomes imperative to have in place viable and economically sound exchange rate policies.

However, due to the inconsistencies inherent in the Ordinary Least Square (OLS) estimation model

used, specifically the existence of serial correlation among the explanatory variable as indicated by the value of Durbin-Watson statistics prompted the use of the Cochrane-Orcutt method. The results obtained shows that, both inflation rate and the dummy, which captured SAP, meet with apriori expectation signs while exchange rate and GDP were unfavoured. Hence, increase in exchange rates led to increases in FDI. The policy measures of SAP had positive effects on FDI, though the effects are weak. The results obtained were informative. In light of this, frequent policy changes and exchange strategies have implication for exchange rate and obvious consequences for sectors that depends on foreign inputs or foreign sources of capital.

From this paper, it is clear that, other macro and non-macro economic variables can serve as determinants of capital flows. Exchange rate, lending rate, political stability etc are the major factors that will enhance economic growth and development in Nigeria (Anyainvu and Oaikhenan, 1995).

Thus, it is pertinent that Nigeria as a nation take a critical look at her economic policies and exchange rate regimes to curb (he instability in the naira exchange rate as well as boost her non-oil export sector which is lacking. If all these are done effectively and efficiently, it is hoped that Nigeria will be on her way to a strong, viable, politically stable and verile economic environment.

### **Bibliography**

Anyanwu, J.C. (1993). *Monetary economics: Theory, policy and institutions*. First Edition. Hybrid Onitsha.

Anyanwu, J.C. and Oaikhenan II.E. (1995). *Modern macroeconomics: Theory and application in Nigeria*. Onitsha: Joanee Educational Publishers Ltd.

Central Bank of Nigeria (CBN). *Statistical Bulletin* (14, 2003).

Iyoha, M.A. et al. (1998). *An Introduction to Modern Economics*. Benin City: Mareh Publishers.

Iyoha, M.A. and Unugbro, A.O. (2005). *International trade and finance*. Reversed Edition. Mindex Publishing. Benin City.

Obadan, M.I. (2004). *Foreign capital flows and external debt*. Lagos: Broadway Press Limited.

Odozi, V. A. (1994). *Interest rate and naira exchange rate developments*. CBN Bulletin 1 8.

Ojo, M.O. (1990). *The management of foreign exchange under the Nigerian structural adjustment programme*. CBN Economic and Financial Review, 28.

Onwioduokit, E.A. (1999). International capital mobility to Nigeria in the next millennium. *Journal of the Financial Institute Training ('enter*.

Solako, H.A. and Adcbuisuyi, B. S. (2001). *Determinants of foreign direct investment in Nigeria - An empirical investigation*. CBN Economic and Financial Review 29.