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CAPITAL FLOWS TO NIGERIA: ISSUES AND DETERMINANTS

by

E. A. Essien and E. A. Onwioduokit¹

This paper examines issues in capital flows to Nigeria as well as its determinants. Using the Error Correction Modeling technique, results indicate that the macroeconomic conditions of host country, reflecting opportunities for investment, risk, market conditions, and rates of returns are very crucial in attracting capital. Most interestingly the speed of adjustment, indicating the sustainability of capital flow was highly significant. Thus, capital flow adjusts rapidly to changes in these variables in Nigeria. The paper concludes that the relevance of these variables imposes a great challenge to policy makers and recommends that the newly acquired autonomy of the Central Bank of Nigeria should help in the pursuance of a purposeful monetary policy that would make the macroeconomic conditions conducive for the inflow of external capital.

1. INTRODUCTION

The need for external capital inflow arises when desired investment exceeds actual savings. They are necessary also owing to investments with long gestation periods that generate non-monetary returns; growing government expenditure that are not tax-financed; and when actual savings are lower than potential savings owing to repressed financial markets, and even, capital flight.

Several variables, which create dependence on foreign capital have been identified. They could be classified into fluctuating variables such as exports, imports and invisibles; offsetting variables like debt service and reserve creation, and rigid variables, including minimum level of imports, stage of economic development and exportable surplus.

External capital flows could be non-debt creating flows (as in official transfers (grants) and direct investment flows), debt creating flows (as in official development finance), commercial bank loans and international bond offerings, or could be a hybrid e.g Foreign Portfolio Investments and International Equity Offerings.

Historical antecedents indicate that until the First World War, capital to

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developing countries came directly mainly from Great Britain, France, etc, to their former colonies. By 1950s the United States (US), other industrial nations and multinational agencies started official assistance to less developing countries (LDC's). Shortly after the Second World War and up to the period of the oil shocks starting from the late 1970s, there was a surge in bank lending to LDC's, particularly to Latin America under Sovereign guarantee. Bank lending dwindled thereafter in the wake of the debt crisis of 1982; and so official assistance and capital flows were re-directed towards developed nations and the securitization of international finance started in developing countries. The upsurge of emerging market economies at the beginning of the 1990s witnessed a revival of private finance in the form of foreign direct investment (FDI) and foreign private investment (FPI) flows.

The number of claimants to foreign assistance has increased currently as the World Development Report (WDR, 1990) observed, "... a substantial increase in the resources for fighting poverty in the poorest countries appears affordable. It is a matter of political commitment and the reassessment of donor priorities". In spite of the above assertion, foreign assistance has over the years generated various perceptions. First, projects are formulated without consideration for the long run implications on the economy. Second, the conditionalities attached to such assistance often cut budgets in the social sectors, thus, accentuating poverty. Thirdly, it often leads to exchange rate crisis, massive devaluation and terms of trade deterioration. Fourthly, priorities in recipient countries are formulated and implemented without consideration for the recipient population. Lastly, project lending are funneled back to donor countries in form of consulting fees.

In all, foreign assistance is often motivated by donors self interest - political, strategic, or economic - and seldom has ethical consideration of assisting in poverty reduction and economic growth. Recipient countries also have themselves to blame for being in such a position as they often formulate and implement policies in very non-democratic ways, resulting in low rate of return on the investment.

International capital flows had recently been marked by a sharp expansion in net and gross capital flows and a substantial increase in the participation of foreign investors and foreign financial institutions in the financial markets of developing countries (World Bank, 1997). While this view has been found to be true for Asian and Latin American countries, the same cannot be said for African countries, especially sub-Saharan African countries (Taylor & Sarno, 1997). Even the liberalization of financial markets in sub-Saharan African countries since the late 1980's has not increased the rate of international capital mobility in these countries.

This emerging picture about capital flow to developing countries, including Nigeria, is worrisome as these countries try to come out of one economic crisis or the other attributed largely to past mismanagement. This study, therefore, examines

issues and determinants of non-debt capital flows, FDI . The major advantages of FDI, whether full or partial are that it brings technology, ideas and access to industrial country markets as well as hard currency, reduces borrower's exposure to changes in foreign interest rates and encourages growth oriented economic liberalization. Specifically, the study seeks to address the questions: What are the macroeconomic conditions for attracting foreign capital, in the form of Foreign Direct Investment, to Nigeria?. What are the factors that motivate these flows and their effects on the economic performance of the country? Are these flows sustainable?

To answer these questions and for ease of presentation, the remaining part of this paper is divided into five sections. Section II reviews literature on theoretical issues in capital flows, as well as the macroeconomic nexus as part of the considerations in financial capital flows, while section III presents trends in Direct Foreign Investment Flows to Nigeria. Section IV discusses the methodological framework, in particular, the estimation technique. In section V, the major findings are presented, while section VI summarizes and concludes the paper with some policy recommendations.

II. REVIEW OF LITERATURE

II.1. Theoretical Considerations

Capital flows are a result of savings/investment imbalances across countries which result in transfer of real resources through trade or current account transactions. They respond to economic fundamentals, official policies, and financial markets imperfections. It is, however, extremely difficult to assess the impact of these policies and distortions because they generally overlap, creating both impediments and stimuli to capital flows.

Several factors deter capital flows to developing countries. They include liquidity, size and concentration of markets, small trading volume, weak capacity to enforce rules, country and regulatory risks and exchange controls. Taylor & Sarno (1997) recognized two sets of factors affecting capital movements. The first are country-specific-pull factors, reflecting domestic opportunity and risk. As developing countries' credit-worthiness is restored, capital (bond and equity) flows are likely to become increasingly prominent source of external finance. For instance, according to them, equity-related capital flows could be very large and come in the form of either foreign direct investment (FDI) or portfolio investment in equities. FDI may be attracted by the opportunity to use local raw materials or employ local labour force. Rates of return, credit ratings and secondary-market prices of sovereign debt, reflecting the opportunities and risks of investing in the country have been recognized

as other crucial determinants of capital flows.

The second set of determinants of capital flows to developing countries are global-push-factors such as interest rates, stable exchange rate and labour market conditions. Thus, as governments make macroeconomic and institutional reforms, international investors gain confidence and are more willing to direct capital flows toward the new market (Parpaionu and Duke, 1993).

Identifying the main determinants of capital flows to developing countries and the push and pull factors at play would help in designing effective policy (see Taylor & Sarno, 1997; Claessens, Dooley, and Warner 1995; Chuham, Claessens, and Marningi 1993; Fernandez - Arias 1996, Fernandez - Arias and Montiel 1996). Also, Fernandez - Arias and Montiel (1996) noted, if the causes of capital flows are largely exogenous to developing countries, compensatory policies are appropriate. However, if the causes are largely domestic, then direct policy design may be more appropriate and effective.

Other important considerations for assessing capital inflow, for policy, have to do with the ability to identify causal factors as well as choosing appropriate instruments of response. Having identified foreign and domestic factors, the causal dichotomy are not pursued in this paper for a number of reasons. First, it is not easy to find an appropriate proxy for these global-push factors as there have not been any agreement in the literature. Second, global factors have been most relevant when considering portfolio flows. This study considers Foreign Direct Investment. As Fernandez - Arias and Montiel (1996) noted, this type of flow is more sensitive to domestic factors than the more liquid portfolio flows, which unfortunately are not so prominent in the capital flow component in Nigeria. Domestic factors assert the role of structural changes in a country's capital and financial markets.

II.2 Host Country Macroeconomic Considerations

The various macroeconomic considerations in host countries have been the impact of monetary policies, real exchange rate and pressures for further liberalization of capital accounts/trade and current accounts on capital flows. Serven and Solimano (1992) noted that monetary, fiscal, and exchange rate policies directed at correcting unsustainable macroeconomic imbalances also affect private capital flows. They observed that, standard macroeconomic package oriented towards improving the balance of payments and reducing inflation includes restrictive fiscal and monetary policies supplanted by a real devaluation. The restrictive monetary and credit policies, which are usually part of most stabilization packages, impact on investment through rise in the real cost of bank credit and by increasing the opportunity cost of retained earnings through an increasing interest rate. The

combination of these impacts raise the user cost of capital, thereby reducing investment. (See Solimano, 1989). However, Blejer and Khan (1984) and Lim (1987) found that in a repressed financial market (which is the hallmark of most developing economies, including Nigeria), credit policy affects investment directly, since credits are allocated to firms with access to preferential interest rate mechanism. But Van Wijnbergen's (1993) results assert that interest rate also affect firms that borrow from the informal money market. Thus, the institutional structure of financial markets in developing economies is important in explaining the effect of monetary and credit policy on foreign private capital flows for investment, as well as, the transmission mechanism of such policy (Montiel, 1993).

With respect to fiscal policy, it is clear from empirical findings that high fiscal deficits increase interest rates or reduce the availability of credit to the private sector, thus, crowding out private investment. It is, therefore, argued that the reduction in the public deficit during macroeconomic stabilization/adjustment would allow private investment to expand.

Empirical studies of foreign capital flow to developing countries indicate that changes in output are the most important determinants of private foreign capital flow (Blejer and Khan, 1984; Green and Villanueva, 1991). Servén Solimano (1992) however, describes the results as puzzling because a substantial amount of variation in output is mostly transitory and hence should not affect investment. Solimano (1992) undertakes a review of other variables that influence foreign capital flows to include exchange rate, irreversibility of investment, uncertainty, and the role of credibility. He concluded that if the domestic private investment climate is not conducive, it becomes difficult to attract a substantial inflow of capital across the borders.

Incentive is another important issue in capital flows. Government policies such as tax holidays, differential tax structures, etc, can change the level of a return on foreign capital. Although most countries have in place some policy measures to enhance expected profits for foreign investors, the impact of specific subsidies or other incentives in developing countries is, however, uncertain.

Several studies have stressed the importance of tax structure. Shah and Slemrod (1990) maintained that foreign capital flows to Mexico are sensitive to tax regimes. In addition, tax treatment also affects decisions on investment-spending and type of financing. International differences in tax treatment affect initial foreign investment incentives as well as later decision on research and development spending as well as product innovations. Tax law can affect the kind of cross-border flows like decisions on debt-equity ratio for individual companies in a country in which the investment decision had already been made (Huizinga, 1992).

The incomplete credibility of policy reforms is an important source of

uncertainty. Thus, except the investors view policy reform programmes as being internally consistent and pursued irrespective of the implied social costs, the possibility of reversal will become the key determinant of the investment response (Serven and Solimano. 1992). The credibility factor may not necessarily be a theoretical issue. From practical perspectives, most developing countries that have had policy reversals have not adequately attracted foreign capital flows. Between 1993 and 1998 Nigeria reversed the reform policy and replace it with “pseudo-controlled” regime. In January 1995, the then administration instituted what it christened “guided de-regulation”. Such signals will not attract investors because of the loss of confidence on how the economy is managed (Ekpo, 1996).

There is need to underscore the importance of institutional capacity in attracting foreign capital flows. Inadequate administration of justice, deficient property rights, incessant political intrusion in private business, corruption, lack of transparency and accountability as well as excessive bureaucratic bottleneck are major factors that undermine foreign capital flows. Pfefferman et al (1992) observed that the quality of institutions in developing countries can influence foreign investment; strongest responses occur when investors are convinced that improvement in institutions will endure. Furthermore, they argued that positive responses by investors take place in countries with an open export-oriented economy, a convertible currency, a large-scale privatization programme, and emergence of strong trading blocs which will reduce the likelihood of policy reversals by governments.

III. TRENDS IN CAPITAL FLOWS TO NIGERIA, 1970-1997

Several studies, including Montiel, (1993) have provided evidence of a huge and increasing degree of international capital mobility among the major industrial countries and among emerging market economies which offer high returns, ensure macroeconomic stability and liberal trade regimes as well as ease financial restriction and offer free access to listed stocks. For instance, while capital flows to developing countries have been on the increase from 1986, averaging 30 per cent between 1986 and 1994, a greater proportion of these flows have been to emerging markets of Asia and Latin America. In 1986, 93.3 per cent of capital to developing countries went to these emerging economies while 3.7 per cent went to sub-Saharan Africa and only 1.6 per cent to Nigeria. This trend has prevailed since that period and capital investment flow to emerging markets has consistently averaged over 90 per cent, while flow to sub-Saharan Africa as at 1987 has never been more than 9.75 per cent. For Nigeria, there has been a steady decline from a level of 7.3 per cent in 1989 to 1.56 per cent in 1994.

The observed trend in capital flows to developed and sub-Saharan countries as well as Nigeria has persisted up till 1998. While flows to developed countries have continued to increase, sharp declines have been noticed for sub-Saharan African countries and Nigeria. For instance, from a decline of 1.25 per cent in 1995, flow of capital has worsened and now stands at 0.46 per cent. Correspondingly, the flow to sub-Saharan Africa countries has declined markedly to 0.97 per cent from 2.54 per cent in 1995 (see World Bank Debtor Reporting System: IMF Data).

Real foreign direct investment in Nigeria has been unstable over the years. From \$543.8 million in 1970, it rose to \$841.9 million in 1973. By end 1974, FDI fell by 40.4 per cent from the previous year's level to \$501.9 million. It, however, rose by 48.5 per cent to \$745.1 million in 1975, before declining to 21.7 per cent in 1976. FDI increased by 21.6 per cent to \$709.2 million in 1977, but plummeted to \$317.4 million in 1978 before rising by 28.6 per cent to \$408.3 million in 1979. In 1980, Nigeria recorded a negative FDI of \$867.5 million, representing a 12.5 per cent decrease from the 1979 levels. This declining trend was maintained through 1984. Between 1985 and 1986, FDI fell by 65.8 per cent, reflecting the decline in world oil prices which fell from over \$20.00 a barrel to about \$9.00 a barrel. Following the adoption of the Structural Adjustment Programme (SAP) in 1986 and the subsequent liberalization of some aspects of the Nigerian economy, FDI in the country has been on an increasing trend, with the exception of 1990 when a decline of 69.5 per cent was recorded. For instance, the FDI rose to \$1374.72 million in 1988, the second year of SAP operations in Nigeria, but declined by 24.0 per cent to \$634.87 million in the succeeding year, 1989. Between 1990 and 1993, the FDI exhibited a winding trend, reaching their levels of \$566.14 million in 1991, \$678.14 million in 1992 and \$1009.14 million in 1993.

The reversal of the SAP policies by government resulted in a drastic decline in the FDI in 1994. Indeed, the 1994 level of \$357.56 million was a decline of 81.6 per cent from the preceding year's level, thereafter it has been on a persistent decline up to 1996. On the average, the FDI declined by 27.1 per cent between 1994 and 1996. In 1997, however, an increase of 38.45 per cent from the prior year's level was recorded. Empirical studies have confirmed that the decline in the FDI in Nigeria has been as a result of economic crisis, declining productivity, reduced capacity utilisation and other factors, mainly policy reversal which tended to send uncertainty signals to potential investors (Ekpo, 1996).

The recent trend of portfolio investment in Nigeria indicates that this component of foreign investment was principally characterised by disinvestment. Portfolio investment in 1986 stood at ₦103.4 million. It increased to ₦1,018.6 million in 1988. Between 1989 and 1992, there was an outflow of portfolio investment owing principally to policy reversals. Onwioduokit (1998), posited that foreign private

investment and its components increased in years in which economic fundamentals moved in the right direction.

IV. MODELING CAPITAL FLOWS

IV.1 Methodological Framework

This section contains a brief description of the estimation method used in this study. Denote capital flows to Nigeria, Cf_t assumed to be integrated of order d , i.e. $I(d)$. Also, define country-specific factors as x_t and assume that these factors contain at least one $I(d)$ variable and no higher order integrated process, $I(b)$, $b > d$. The cointegrating relationship between capital flows and the factors affecting it could be investigated and its long and short-run behaviour determined. The concept of cointegration relates to the existence of a long-run equilibrium relationship to which an economic system converges overtime and any equilibrium relationship among the set of non-stationary variables influencing it implies that their stochastic trends must be linked. With regards to capital flow, the hypothesis that the capital market clears allows us to equate demand and supply of capital. Any deviation, therefore from equilibrium in the capital market must be of a temporary nature. The key assumption of the above theory is that the equilibrium error must be stationary.

Economic variables are, inherently, non-stationary, and thus, could meander without any tendency to return to equilibrium in the long-run. Implicit in the cointegration theory is the fact that there exists a linear combination of these non-stationary variables that is stationary.

Consider the relationship;

$$Cf_t = \alpha'x_t + \varepsilon_t \quad \dots\dots\dots(1)$$

where,

- Cf_t = capital flow at time, t
- x_t = country-specific factors assumed to contain at least one $I(1)$ and no higher order integrated process.
- ε_t = error term.

Analyzing the long-run behaviour of capital flows implies investigating cointegrating relationship in (1). If ε_t is stationary, then the $I(1)$ variables in x_t may be thought of as capturing the long-run component in Cf_t , while ε_t captures the temporary or short-run movements.

This study would test for the order of integration of the variables as well as

cointegration along the Engel and Granger (1997) two step approach. For indeed, if the order of integration of the dependent variable in a long-run relationship is lower than the highest order of integration of the explanatory variables, there must be at least two explanatory variables integrated of this highest order if the necessary condition for stationarity in the error term is to be met, otherwise equation (1) would be mis-specified Cheremza & Deadman (1992), Benerjee et al (1993).

A search for cointegration vector to confirm that this is indeed a cointegrating relationship and determining the number of cointegrating relationship would be carried along the Johansen (1988 and 1991) approach. This has been recognized as a powerful technique in terms of the power of the cointegration tests.

We are, however, not assuming that the Engel-Granger and Johansen procedures are comparable as they are grounded in different econometrics techniques. While in the Engel-Granger approach, the endo-exogenous division is assumed, and thus, they may be only one cointegration relation, in the Johansen procedure, there are no exogenous variables as it is based on the vector autoregression (VAR) modeling of Sims (1980). The Johansen technique also yields results that are invariant with respect to the direction of normalization because it makes all the variables endogenous. Furthermore, it provides estimates of all the cointegrating relations that exists within a system of variables and provides a test statistics for determining their number. Lastly, the likelihood ratio test statistics used in the analysis has an exact known distribution and given these distributional properties of the maximum likelihood (ML) estimation, specification tests can be carried out on the cointegrating vectors.

Consider, z_t containing n variables of the model,

$$z_t = \sum_{i=1}^k A_i z_{t-i} + \varepsilon_t \quad \dots\dots\dots(2)$$

equation (2) represents an unrestricted VAR model with ε a vector of random errors. Assume z_t is $I(d)$, i.e integrated of the same order (this is not very restrictive), then z_t in $CI(d,b)$ with cointegrating matrix β means that $\beta'z_t \sim I(0)$. The cointegrating transformation of the VAR model in (2) could be represented, without intercept, for convience, by

$$\Delta z_t = \sum_{i=1}^{k-1} \Gamma_i \Delta z_{t-i} + \Pi z_{t-k} + \varepsilon_t \quad \dots\dots\dots(3)$$

From Engel and Granger (1987), or Johansen (1988), it follows that under some general conditions;

- [i] If the rank of matrix Π , r is equal to n , the vector process z_t is stationary;
- [ii] If the rank of matrix Π is equal to $r < n$, there exists a representation of Π such that, $\Pi = \alpha\beta'$, where α and β are $n \times r$ matrices. Thus, z_t are cointegrated with the cointegrating vectors β_1, \dots, β_r being particular columns of the cointegrating matrix β , while α is the speed of adjustment coefficient.

The model in (3) is a multivariate or k -order VAR generalization of an error correction representation. If $\Pi = \alpha\beta'$, the matrix $\beta'z_{t-k}$ constitutes a set of r error correction mechanisms separating the long and short run responses in the model.

The Error Correction representation of our model from above in an autoregressive distributed lag (ADL) form is given as:

$$\Delta Cf_t = \phi - \rho(Cf_t - \alpha'x_t - \beta'z_t) + \theta \Delta Cf_{t-1} + \sum_{j=0}^k \psi_j \Delta x_{t-j} + v_t \quad \dots\dots\dots(4)$$

where,

k = number of lags

v_t = error term, assume white noise.

Equation (4) presents the short run dynamics in capital flows, while preserving the long run equilibrium relationship. Thus, long run determinants of capital flows that are important could be determined from the cointegrating relationship in (1) as well as the ones determining short-run movement as in (4). The speed of adjustment parameter, ρ helps in measuring the sustainability of capital flow. For instance, the higher the speed of adjustment the more sustainable is capital inflow. This implies that the explanatory variables are very crucial in attracting and sustaining foreign direct investment in Nigeria. While in some literature this adjustment is assumed to be costless and instantaneous, this is more likely for more liquid flows like portfolio investment. Even though it is recognised that foreign direct investment could be liquidated by borrowing domestically and transferring the proceeds abroad, that would depend on the host country's liberalisation policy. Thus, the ease with which investors can liquidate their investments determines the degree of sustainability of such investments.

IV.2 The Empirical Model and Data

The major determinants of capital flows to Nigeria could be ascribed to country-specific factors, representing opportunities for investment, risk, market conditions, rate of returns, level of economic activities, capacity to stimulate the economy, and vulnerability to external shocks.

The data set used for this study were obtained from Statistical Bulletin, a publication of the Central Bank of Nigeria and International Financial Statistics published by the International Monetary Fund, IMF. Credit rating was obtained from an earlier study (Ekpo, 1996). The data for this study covered the period 1970 to 1997.

The study took cognisance of the fact that the Nigerian economy has undergone some form of macro-economic and institutional reforms within the period 1970 to 1997 and, thus the confidence of investors depend on the opportunity cost of investment in the country. This would be proxied by the difference between the short-term foreign and domestic interest rates. If this premium is high, then either domestic interest rates would be falling or foreign interest rates would be increasing in which case capital would move away from the host country and inflow otherwise.

Exchange rate stability in the host country is necessary for attracting foreign investment, however preliminary results from correlation analysis indicated that the correlation between capital flow and official exchange rate was low compared to the nominal effective exchange rate. More so, as Nigeria has multiple trading partners, it becomes more appropriate, for policy and analysis, to employ an index (Mordi & Audu, 1991). The implication for foreign direct investment of changes in output, following Blejer and Khan (1984), would be examined using real income as a suitable proxy.

Thus, macro-economic factors such as real income, a country's credit rating, debt service ratio, the premium between the domestic and foreign interest rates, representing short-run opportunity costs of investment, nominal effective exchange rate, representing the domestic exchange rate in terms of a basket of foreign currencies, are assumed to be crucial determinants of capital flow to Nigeria. In this study FDI would be used to proxy capital flow since portfolio investment to Nigeria is very small, at least for the period under consideration.

The capital flow model for Nigeria, could be represented mathematically, as:

$$CPL = F(CRR, DSR, IND, NER, RGDP) \dots\dots\dots(5)$$

where,

CPL = Foreign direct investment

CRR = Credit rating

DSR = Debt service ratio

IND = Foreign/Domestic interest rate differential

NER = Nominal effective exchange rate

RGDP = Real Income

or,

$$CPL_t = \alpha_0 + \alpha_1 CRR_t + \alpha_2 DSR_t + \alpha_3 IND_t + \alpha_4 NER_t + \alpha_5 RDGD_t + \varepsilon_t \dots\dots\dots(6)$$

A priori,

$$\alpha_1, \alpha_5 > 0 \text{ and } \alpha_2, \alpha_3, \alpha_4 < 0.$$

It is expected also that for a long-run relationship between capital flow and the factors identified to exist, the error correction term in (1) has to be stable over time. That is, the relationship is a cointegrating relationship and equation (4), apart from maintaining long-run equilibrium relationship, captures the short-run dynamics in the model by incorporating an error correction term. The results for the model in equation (6) were obtained using Econometric Views software, version 1.1a. The result from this analysis using the Engel-Granger two-step approach and the Johansen procedures are presented below. The model is in first difference.

V. RESULTS, MAJOR FINDINGS AND POLICY RELEVANCE

V.1. Results and Major Findings

Table 1: Results from Stationarity Test

Variable	Augmented Dickey-Fuller Test Statistics	Max. Lag	Order of Integration
$\Delta(CPL)$	-4.1375	2	1
$\Delta(CRR)$	-3.7879	2	1
$\Delta(DSR)$	-3.8183	2	1
$\Delta(IND)$	-4.1284	2	1
$\Delta(NER)$	-3.1226	2	1
$\Delta(RGDP)$	-3.1532	2	1

Critical Value

1% = -3.7343, 5% = -2.9907, and 10% = -2.6348

The results from the augmented Dickey-Fuller set of unit root tests of the series, shown above, indicated that all the variables were integrated of order one i.e I(1), at the 5% level of significance and we are thus, justified to test for cointegration in equation (1). The result from the test of non-stationarity of the residuals (RES) in equation (1) is presented below.

**Table 2: Augmented Dickey-Fuller Unit Root
Test on Residual (RES)**

Lag No.	RES	Critical Value (1%)	Critical Value (5%)
1	-4.5017	-3.7076	2.9798
2	-4.9607	-3.7204	2.9850
3.	-3.7803	-3.7343	2.9907

The test on the residual from the static regression of capital flow on the variables that affect them was significant at the 1% and 5% level, respectively, as shown above. We reject the null hypothesis of no cointegration and conclude that the variables are cointegrated. In order to strengthen this finding, we also employed the Soren Johansen (1991) procedure in a VAR system. This test allows us to determine the number of cointegrating equations. The particular test used was without any deterministic trend in the data but with a lag, $k = 1$.

Table 3: Results from Johansen Cointegration Test

Eigen Value	Likelihood Ratio	Critical Value (5%)	Hypothesized No. of C.E(s)
0.681896	85.45847	82.49	None
0.566810	55.67863	59.46	at most 1
0.448381	33.92759	39.89	at most 2
0.413700	18.46027	24.31	at most 3
0.158100	4.578260	12.53	at most 4
0.003985	0.103813	3.84	at most 5

Following the decision rule for the Johansen cointegration tests we reject the null hypothesis that the number of distinct cointegrating vector, $r = 0$ and conclude that there is no significant evidence of more than one cointegrating vector, i.e. there is only one cointegrating equation. Since there is only one cointegrating vector, then there is only one linear combination of the variables that is stationary, all other linear combinations are non-stationary. The normalized cointegrating coefficient gives the long-run relationship and is given by the first row of the β' matrix as in equation (3) as;

$$\text{CPL} = \begin{matrix} -57.46 & 21.88 & 1510.96 & -84.63 & 0.084 \\ (-0.77) & (0.21) & (8.88) & (-2.45) & (2.40) \end{matrix} \begin{matrix} \text{CRR} \\ \text{DSR} \\ \text{IND} \\ \text{NER} \\ \text{RGDP} \end{matrix}$$

This result agrees with the long-run solution of our model from static regression.

From our cointegration test it was seen that there was only one cointegrating relationship and following Engel and Granger (1987) representation theorem, the residual from the cointegrating regression is a valid error correction and the speed of adjustment, ρ , in equation (4), is determined as the coefficient of the error correction

variable. If ρ is statistically equal to zero, the change in capital flow does not respond at all to the deviation from the long-run equilibrium in period $t-1$ (Taylor and Sarno, 1997).

Adopting the general to specific framework, we proceeded to estimate an over-parameterised error correction model of capital flow to Nigeria from where a parsimonious error correction model would be obtained. The error correction variable is denoted ECV.

**Table 4: The Over-parameterised error correction
Model of Capital Flow to Nigeria**

Variable	Lag	Coefficient	t-value
CONS		1178.03	0.756
Δ CPL	1	0.859	2.078
Δ CPL	2	0.712	2.297
Δ CRR		-84.21	0.397
Δ CRR	1	201.18	0.894
Δ CRR	2	-310.89	-1.258
Δ DSR		129.42	0.377
Δ DSR	1	-262.61	-0.856
Δ DSR	2	-71.22	-0.274
Δ IND		-1306.13	-3.355
Δ IND	1	781.43	1.176
Δ IND	2	1521.28	2.286
Δ NER		43.70	0.315
Δ NER	1	-28.12	-0.121
Δ NER	2	-242.48	-1.236
Δ RGDP		-0.0054	-0.027
Δ RGDP	1	-0.3536	-1.610
Δ RGDP	2	-0.104	-0.463
ECV	1	-2.282	-3.505

$R^2=0.942$, $F(18,6) = 5.43$, $DH = 2.20$, $SC = 18.05$

The parsimonious model is shown in Table 5 below, arrived at using an admixture of statistical test of significance of the coefficients in the autoregressive distributed Lag (ADL) model in equation (4), the statistical significance of Lags consisting of a series of F-test for the lag that contains the most information and the Schwarz Criteria (SC) for which a reduction in the SC is an indication of parsimony. The intercept was not significant and was summarily dropped from the model.

Table 5: The Parsimonious Error Correction Model of Capital Flow (CPL) to Nigeria

Variable	Lag	Coefficient	t-value
Δ CPL	1	0.845	3.618 a,b
Δ CPL	2	0.660	3.211 a,b
Δ CRR	2	-251.992	-1.971 a,b
Δ DSR	1	-248.769	-1.491 b
Δ IND	0	-1274.665	-5.387 a,b
Δ IND	1	830.719	2.339 a,b
Δ IND	2	1449.939	3.239 a,b
Δ NER	2	-273.91	-2.40 a,b
Δ RGDP	1	-0.329	-2.566 a,b
ECV	1	-2.202	-6.893 a,b

$$R^2 = 0.919, F(10,15) = 17.12, DH = 2.12, SC = 17.23$$

a = significance at 5%, b = significance at 10%

An examination of the parsimonious model above shows that the past values of capital flow were positively related to its current value and significant. Also, the a priori expectations about the signs of the parameters were met in debt-service ratio, interest rate differential and nominal effective exchange rate. Credit rating did not have a proper sign even though it had the appropriate sign at its current value as indicated in the over-parameterized model in Table 4. Real income did not also have the expected sign. All the variables were significant at 5% level, except debt-service ratio which was significant at 10%. The coefficient of determination was significantly high and overall regression was significant. There was no indication of the presence of serial correlation as shown by the value of the Durbin-H statistics. The error correction coefficient was relatively large and highly significant at both 5% and 10% levels.

Other findings of this study could be summarised as follows:

- i. A unit change in capital flow in the past one year would increase capital flow and its value seems to decrease as the lag increases. Thus, past increases in capital flow would seem to reduce the flow in the current period. This result is very significant for Nigeria. This trend may be due to the loss of investor's confidence in the country owing to several factors including political uncertainty.
- ii. Credit rating was significant at the second lag but had a negative sign. Credit rating measures the risk associated with investing in a country, but Nigeria's rating had been declining rapidly in the past decade, thus, this result was not

surprising.

- iii. The relative importance of debt-service ratio in capital flow has been emphasised in this dynamic error correction model. A country with high debt-service ratio is not likely to attract foreign inflow of capital. Debt-service ratio is associated with a country's domestic economic environment and this result is indeed revealing.
- iv. Another underlying factor in capital flow to Nigeria is the differential between the domestic and external rate of return. The result obtained shows that there is an inverse relationship between this premium (FIR-INR) and flow in the current period, but the responsiveness of changes in capital flow to changes in the premium is positive in the first and second lags. Interest rate premium would increase if interest rate falls in host country or world interest rate increases and thus, there would be a corresponding decline in capital inflow. A fall in domestic interest rate discourages investment in host country and this was highly significant. However, our result shows that after one or two years there was capital inflow irrespective of this fall in interest rate. This may be due to the fact that for a part of the study period interest rate was administratively fixed, hence the increase in capital to Nigeria was more as a result of the dwindling world interest rate, especially U.S interest rate during a greater period of this study, and had only recently started to rise after a prolonged decline.
- v. The result of the nominal effective exchange rate variable indicates that capital flow responded to changes in nominal effective exchange rate after two years. The relative change in the domestic exchange rate compared with the rest of the world does not immediately cause capital flow to decline. The result reveals that capital inflow to Nigeria could be driven by the parallel market exchange rate as shown in the over-parameterized model where the current value of the nominal exchange rate was not significant.
- vi. Real income in Nigeria showed a significant negative relationship with capital inflow in the current period as well as in the first two lags even though it was only significant in the first lag. The growth rate of income has been declining significantly in Nigeria over the sample period and this result confirms the findings in Solimano (1992).
- vii. The speed of adjustment parameter, as indicated by the coefficient of the error correction variable was highly significant, with appropriate sign. Thus, foreign direct investment in Nigeria adjusts rapidly to changes in the explanatory variables. The large value of 2.2 also demonstrates the importance of all the variables used in the model in explaining capital flow to Nigeria. It is an indication of the existence of a long-run equilibrium relationship between

capital flow and the variables that influence its short-term movements which were used in the model. Thus, foreign direct investment, credit rating, debt-service, interest rate differential, nominal effective exchange rate and real income are cointegrated.

V.2. Policy Relevance

The world economy has over the years been integrating at a faster rate than at any other time in its history. The improvement in the level of technology and cross border trade in financial assets has been overbearing. This will likely continue at an increasing tempo in the years ahead. The significance of the results obtained from the empirical model is indeed revealing. For instance, the relationship established between capital flows to Nigeria and variables like debt-service ratio, interest rate differential and nominal effective exchange rate imposes a serious challenge on policy makers. To attract foreign capital to Nigeria, the authority should ensure that the interest rate in Nigeria are in line with world interest rate through an admixture of effective monetary policy. In this regard, the newly acquired autonomy of the Central Bank of Nigeria should come in handy in the pursuance of an independent and purposeful monetary policy. The use of administrative control, of any form, on interest rate as applied in some years in the past should be discouraged.

Regarding debt service, the results show that the more we are able to service our debt timely and efficiently, the better the country would stand to benefit from the foreign capital flow. There is, thus, the need to professionalize the management of our external debt. Adequate debt- management strategy should be put in place and the skills of the personnel at the appropriate ministries responsible for its management should be updated to keep pace with current realities. A situation where ill-equipped civil servants, without relevant knowledge of the mechanics and dynamics of debt management in the emerging era, are allowed to negotiate with technically better creditors is not acceptable.

The result for the exchange rate shows that there is the need to sustain the value of the exchange rate at free market setting. This calls for the application of appropriate exchange rate policy that would enable the naira to achieve a realistic level. The deviation of credit rating from the a priori expectation could be explained by the fact that for most of the study period, the credit rating of Nigeria was consistently on the downward trend owing, principally, to the fact that Nigeria's political environment, which constitutes a significant weight in the basket of variables considered in its computation, was unstable. There is need to consolidate the expected gains from the democratic process that has begun.

Overall, there is need to continue with the current liberalisation policy of government, while also removing the last vestiges of control in the capital accounts so as to facilitate free flow of foreign capital into the country.

VI. SUMMARY AND CONCLUSION

This paper discusses capital flow to Nigeria. The need for foreign capital in the development efforts of the country was underscored. Using cointegration technique, the paper identified the specific variables that influence capital flow to Nigeria to include credit rating, debt service ratio, interest rate differentials, nominal effective exchange rate, and real income. The empirical results showed the existence of a long-run equilibrium relationship between these variables and capital flow to Nigeria. It is, therefore, clear that capital movements in a globalised economy cannot be restrained. What is important is for the country, through appropriate policies, to create an enabling environment for a sustained inflow. Specifically, macroeconomic stability should be achieved through a well focused synchronization of fiscal and monetary policies. The existing capital account controls should be removed in a well sequenced manner so that capital inflow and outflow would not be hindered. In addition, the democratisation process in the country should be conclusive to help improve the country's credit rating.

It is expected that in the twenty first century, the movement of capital across national borders would intensify, as capital like other factors of production, would continue to move to areas of highest reward. Nigeria should not be left behind in this trend.

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