External debt and capital flight in Nigeria: *is there a revolving door?*

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Abstract

Using the residual method of capital flight estimation, this paper estimates Nigerian capital flight over the period 1970 – 2001 and finds a close correlation between external debt and capital flight flows. This phenomenon suggests a paradoxical *revolving door* of a bi-directional flow of capital, i.e. where capital enters the country in the guise of external borrowing and simultaneously slips out of the country as private capital flight. The research question addressed by this paper is whether such a financial revolving door relationship exists in Nigeria, just as previous empirical researches had established in a number of countries. The paper utilises a simultaneous equation model and three stage least square estimation technique (3SLS), in addition to two-way Granger causality tests, to obtain statistical evidence that confirms the existence of a financial revolving door relationship between the two endogenous variables. In addition, existence of stronger causality from debt to capital flight is instrumental in showing that growing public deficit and the resulting increase in external debt is being used as a transfer mechanism for capital flight.

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1 Introduction

The most pronounced concern among policy makers, researchers and key stakeholders in economic development is that most developing countries, especially in the Sub Sahara Africa (SSA), are riddled with heavy debt burdens, foreign exchange shortages, transient and chronic poverty. Nevertheless, capital flight amounts to a substantial proportion of the very resources, which are essential for financing economic growth to reverse the perverse economic trends. As the severity of external indebtedness become more pronounced, so too is capital flight problems in these countries (Ajayi, 1995).

Following the logic of diminishing returns, the rate of return to capital should be higher in capital scarce developing countries than in wealthier countries, and therefore capital should flow from the latter towards the former. The net risk-adjusted returns may be lower because investment is riskier in developing countries and this could explain why capital continues to flow in the opposite direction. However, the risky environment that propels capital out of developing countries is equally expected to discourage investment by foreigners as well. However, the simultaneous occurrence of high external indebtedness and capital flight in an economy negates this logic. Pastor (1990), succinctly put this questions as:

> *"if the investment climate in a country is negative enough to push out local capital (flight), why would savvy international bankers extend their own capital in the form of loans (debts)?"*

This phenomenon describes a paradoxical revolving door of a bi-directional flow of capital, i.e. where capital enters the country in the guise of external borrowing and simultaneously slips out of the country as private capital flight. This contradicts the usual textbook understanding

of the issue, which postulates that a favourable investment climate in any country would not only attract foreign capital but also retain domestic investment.

These issues are significant for Nigeria, as it ranks very high in the World Bank's classification of the ten most heavily indebted countries with a total external debt obligation of over US$34 billion. The available estimate of capital flight from Sub Sahara Africa, inclusive of Nigeria, indicates that the sub-continent experienced dramatic financial haemorrhage over the past three decades. In a study of 30 SSA countries, Ndikumana and Boyce (2002) estimated total capital flight for the period 1970 – 1996 to have been about $187 billion in 1996 dollars. Including interest earnings, the stock of capital flight for the sample stood at $4274 billion, equivalent to 145 per cent of the total debt owed by the same group of countries in 1996. In other words, SSA is a net creditor to the rest of the world in the sense that external assets, as measured by the stock of capital flight, exceed external liabilities, as measured by the stock of external debt. The difference being that while the assets are in private hands, the liabilities are the public debts of African governments (see Ndikumana and Boyce, 2001).

Activities and actions of political office holders, especially the military elite, in Nigeria in the last three decades perfectly fit into the mechanisms by which resources are channelled abroad as capital flight. These include embezzlement of borrowed funds, kickbacks on government contracts, trade misinvoicing, misappropriation of revenues from state-owned enterprises and smuggling of natural resources. As the government they headed incurred large external debts, a number of individual military rulers amassed large personal fortunes, substantial part of which were held abroad. For instance, the Swiss bank accounts of the family of General Sani Abacha, who ruled Nigeria for five years, reportedly contain as much as $2 billion at the time it was frozen in 1999 (Onishi, 1999). In addition, a US Senate enquiry in the same year revealed that the Abacha family held multi-million dollar accounts with Citibank in London and New York (Gerth, 1999; O'Brien, 1999).

Given the foregoing background of large magnitudes of debt and flight flows in Nigeria, this paper seeks an empirical understanding and an addition to current literature on the association between capital flight and external debt by examining the debt-flight linkage for the Nigerian economy. Exploration of this fact will have important implications for economic policy formulation, especially as it affects the legitimacy of efforts to service external debts.

The rest of the paper is organised as follows: an operational measure of capital flight for the Nigerian economy used in the study is described in Section 2. Section 3 provides an outline of theoretical linkages between external debt and capital flight. It also contains a review of empirical literature in the area. The framework established in Section 3 is subjected to econometric analysis in Section 4. Section 5 provides an interpretation of the empirical results and Section 6 concluded with summary and policy implications of the main findings.

2 Definitions and measurements of capital flight

In the literature, there is no consensus about the definition of capital flight. According to Ketkar and Ketkar (1989):

> *We must emphasize that the concepts of capital flight and that of its measure, in particular, are complex and elusive endeavors. Because economic agents engaging in capital flight are likely to shroud such activity in secrecy, measuring capital flight precisely is quite difficult.*

One of the disquieting problems with measuring capital flight is the absence of a precise and universally accepted definition of the phenomenon. In a rudimentary sense, the definition of capital flight is left to the operational measures adopted in empirical studies, or within contextual frameworks describing how the capital flees an economy. Because there are competing methods of

measuring capital flight, a crisp, clean, and universally accepted definition of capital flight yet eludes the profession.

The closest that we could come to a crisp and clean definition for capital flight is that of Walter (1987) he observes:

> *… as correctly defined, capital flight, therefore, appears to consist of a subset of international asset redeployment or portfolio adjustments – undertaken in response to significant perceived deterioration in risk/return profiles associated with assets located in a particular country – that occur in the presence of conflict between objectives of asset holders and the government. It may or may not violate the law. It is always considered by authorities to violate an implied social contract.*

However, this definition focuses on capital flight purely as a private sector phenomenon. In Kindleberger's original view of capital flight, he made no distinction between governmental officials or private entrepreneurs carrying capital out of an economy (Kindleberger, 1987). It is plausible that certain types of capital flight are functions of the government, or worse still governmental corruption (Bardhan, 1997).

Several studies suggest capital flight should be distinguished from *normal* capital outflows. According to these studies, normal outflows are based on considerations of portfolio diversification of residents – for example, in terms of portfolio or direct investment and trade credit – and/or activities of domestic commercial banks aiming at acquiring or extending foreign deposit holdings. In their view, the phenomenon of capital flight is somehow related to the existence of extremely high uncertainty and risk with respect to returns on domestically held assets. Residents take their money and run in order to avoid extremely high losses on their domestic asset holdings. Authors like Deppler and Williamson (1987) argue that capital flight is motivated by the fear of losing wealth due to, for example, expropriation of wealth by the government, sudden exchange rate depreciation, non-repayment of government debts, (changes in) capital controls and financial market regulations, and (changes in) tax policies. Walter (1987) and Kindleberger (1987) have a similar opinion. These authors suggest that capital flight should be related to the abnormal or illegal nature of certain capital outflows. Yet, in practice it is extremely difficult to empirically distinguish between normal and abnormal or illegal capital outflows (see also Gordon and Levine, 1989). Therefore, several authors argue that capital flight should not be distinguished from normal capital outflows (see, for example, Erbe, 1985; World Bank, 1985; Morgan Guaranty, 1986 and 1988). It is argued that for countries struggling with (large) current account deficits and external debt payments – and which are thus in need of foreign capital – any capital outflow increases the problems of financing their net imports and debt payments.

The measurement of capital flight is not straightforward, given that there is no consensus on the definition of capital flight. Indeed, several capital flight measures are available in the literature. Not surprisingly, this leads to differences in capital flight estimates for different countries. In general, measures of capital flight that can be distinguished in the literature include the following:

(i) The residual (or broad) method measures capital flight indirectly by comparing the *sources* of capital inflows (i.e. net increases in external debt and the net inflow of foreign investment) with the *uses* of these inflows (i.e. the current account deficit and additions to foreign reserves). This approach starts from the standard balance of payments framework.

(ii) The Dooley method aims at distinguishing normal from abnormal or illegal capital flows. Dooley (1986) sees capital flight as the total amount of externally held assets of the private sector that do not generate income recorded in the balance of payments statistics of a country. Stated otherwise, capital flight is all capital outflows based on the desire to place wealth beyond the control of the domestic authorities. The Dooley method is conceptually different from the residual method. Yet, Claessens

and Naudé (1993) show that in practice capital flight measured according to the Dooley method and the residual method are similar, since most of the data used for calculation are the same in both cases.

(iii) The hot money method measures capital flight by adding up net errors and omissions and non-bank private short-term capital outflows. Cuddington (1986, 1987), Ketkar and Ketkar (1989), and Gibson and Tsakalotos (1993) are examples of authors who have used this method of measuring capital flight. Like the Dooley method, this method corresponds to the idea that capital flight goes unrecorded, due to the illegal nature of these capital movements. The unrecorded capital movements are believed to appear in net errors and omissions. Moreover, by concentrating on short-term flows, medium and long-term outflows are excluded, which are viewed as being normal in character (Gibson & Tsakalotos, 1993).

(iv) The trade misinvoicing method; trade misinvoicing is determined by comparing trade data from both the importing and exporting country. Importers are assumed involved in capital flight when they report higher values of imported goods as compared to the reported value of the same goods by exporters. In turn, exporters are involved in capital flight when they report lower values of exported goods as compared to the reported value of the same goods by importers. Proponents of this measure stress the fact that abnormal capital outflows of residents may be included in export under invoicing and/or import over invoicing, since both these malpractices provide channels to siphon domestically accumulated wealth outside the country.

(v) The asset method. Some authors take the total stock of assets of non-bank residents held at foreign banks as a measure of capital flight. This is the so-called asset method (Hermes & Lensink, 1992; Collier *et al.*, 2001). The asset method is a short-cut measure of capital flight. This measure may be seen as an indication of the minimum amount of assets held abroad, since residents may hold their assets in other forms next to bank accounts, for example, in foreign equity holdings.

Each of the abovementioned methods differ in their estimation of capital flight figures essentially because of the differences in definition of the concept and the distinction they made between normal and abnormal flows. The question has been what is the usefulness of distinguishing between capital flight based on normal and abnormal flows? For a country like Nigeria with excessive external debt obligations and large current account deficits, which is therefore in dire need of foreign capital, any capital outflow (normal or abnormal) increases the problems of financing its net imports, thus reducing economic growth. In this paper therefore we choose to label all resident capital outflows leading to a build-up of assets abroad by residents as capital flight. The residual method of capital flight estimation is therefore preferred in this study, since the method is blind to the distinction between normal and abnormal flow in capital flight estimates. The residual method acknowledges the difficulties of separating abnormal from normal capital outflows and, therefore, measures all unrecorded private capital outflows as being capital flight. According to the residual method, capital flight is calculated as follows:

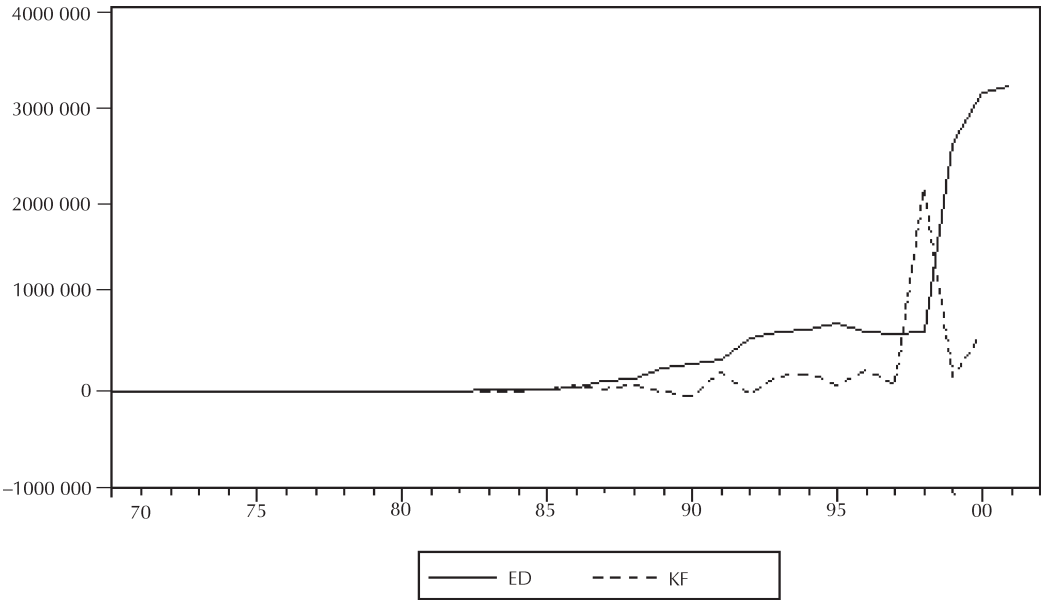
$$KF_r = \Delta ED + FI - CAD - FR \qquad (1)$$

where KF_r is capital flight according to the residual method; Δ denotes change in a variable, *ED* is stock of gross external debt reported in the World Bank data; *FI* is the net foreign investment inflows; *CAD* is the current account deficit and *FR* is the stock of official foreign reserves.

Implementing the estimation procedure described above produced the estimates of capital flight from Nigeria from 1971 – 2001 shown in Table 1 below. Nominal capital flight totalled N3,872,967 million in this 32-year period. This total is roughly equivalent to 27 per cent of debt disbursements to the economy from 1970 to 2002. In other words, for every Naira[1] of external debt accumulated by Nigeria,

private residents accumulated 27 Kobo of external assets. Figure 1 plots the relationship between capital flight from Nigeria and debt disbursements to the economy from 1970 to 2002. A positive and statistically significant correlation is clearly indicated with a simple correlation coefficient of 0.34. Are there any theoretical, *a priori* reasons to expect a positive association between capital flight and net external debt flows? This question is addressed in the following section.

Figure 1
External debt and capital flight in Nigeria: 1970 – 2001 (N'millions)



3 Theoretical linkages and empirical review

The literature on capital flight offered a range of explanations for apparent debt-flight paradox in international capital movements. (see Ndikumana & Boyce, 2002). One set of explanations focuses on asymmetric risks of expropriation of domestic and foreign assets (Khan & Hague, 1985; Cuddington, 1986). Domestic agents are assumed to face a risk of government expropriation of their assets, while foreign capital is guaranteed against this risk by the debtor government and/or by international institutions. Risk asymmetry could also arise from differential tax treatment of domestic and foreign assets. In such a context, private agents maximise portfolio gains by investing abroad, even as foreign lenders find it profitable to issue loans, so that capital flight and foreign borrowing occur simultaneously. Alesina and Tabellini (1989) add political economy considerations to this explanation, suggesting that the incumbent government is happy to accumulate foreign debt since it does not internalise the burden that this will place on future regimes and future generations.

Table 1
External debt and capital flight in Nigeria: 1970 – 2002 (N'millions)

Years	Estimated capital flight	External debt disbursements
1970	1029	175
1971	1580	178.5
1972	1855.7	265.6
1973	-1115	276.9
1974	-3099.5	322.4
1975	2592.1	349.9
1976	3124.5	374.6
1977	5337.8	365.1
1978	2585.9	1252.1
1979	-8421.3	1611.5
1980	-5952.6	1866.8
1981	1574.1	2331.2
1982	-595	8819.4
1983	3066.1	10577.7
1984	178.6	14808
1985	18270.6	17300.6
1986	59587.8	41452.4
1987	27393.2	100789.1
1988	76006.1	133956.3
1989	-11487.7	240393.7
1990	-49230.6	298614.4
1991	206740.6	328054.3
1992	-37540.6	544264.1
1993	153660	633144.4
1994	181194.2	648813
1995	71953.9	716865.6
1996	226855.8	617320
1997	67986.3	595931.9
1998	2114920	633017
1999	164974.4	2577383
2000	597942.6	3121726
2001	NA	3176291
Total	**3872967**	**14468892**

Source: Author's compilations.

A second set of explanations posits direct causal links between capital flight and external debt. The causal relationships can run both ways: that is, foreign borrowing can cause capital flight, while at the same time capital flight can lead to more foreign borrowing. Boyce (1992) distinguishes four possible causal links. First, foreign borrowing causes capital flight by contributing to an increased likelihood of a debt crisis, worsening macroeconomic conditions, and the deterioration of the general investment climate. In such cases of *debt-driven capital flight*, "capital flees a country in response to economic circumstances attributable to the external debt itself". Second, foreign borrowing provides the resources as well as a motive for channelling private capital abroad, a phenomenon Boyce (1992) terms *debt fueled capital flight*. In such cases, funds borrowed abroad are re-exported as private assets. In some cases, the funds may never even leave the creditor bank, simply being transferred into an international private account at the same institution (Henry, 1986). In the other two linkages, capital flight causes foreign borrowing. In the case of *flight-driven external borrowing,* capital flight drains national foreign exchange resources, forcing the government to borrow abroad. Lastly, in flight-fuelled external borrowing, flight capital directly provides the resources to finance foreign loans to the same residents who export their capital, a phenomenon known as "round-tripping", motivated by the desire to obtain government guarantees on foreign borrowing, or by the need to devise pretence for unexplained wealth.

Empirical literature has thus far well documented the fact that capital flight is quantitatively large in high-debt countries. The Guaranty Trust Company study of 1986 estimated that for the period 1976 – 1989, LDCs experienced net capital flight of nearly $200 billion, while simultaneously accumulating $450 billion additional foreign debt. Dornbusch and de Pablo (1997) noted in the case of Argentina that "commercial banks in New York, Zurich and Tokyo had lent to the government the resources to finance capital flight which return to the same banks as deposits".

A number of country-specific empirical studies have investigated and confirmed the existence of a revolving door relationship between external debt and capital flight. Boyce (1992) indicated in a study on Philippines "that large sums of capital flowed into and out of the Philippines through a financial revolving door. Chipalkatti and Rishi (2001) and Firar Demir (2004) confirmed similar results for India and Turkey respectively. Ajayi (1997) using panel data on ten countries, including Nigeria, however, found no evidence of flight-driven external borrowing.

4 Methodology[2] data and estimation techniques

We will adopt the method and model used by Chipalkatti and Rishi (2001) in investigating the revolving door hypothesis in the Indian economy. It was similarly utilised by Demir (2004) for the Turkish economy. As already mentioned, rhe method was originally developed by Boyce (1992) for Philipines. This method modelled the debt-flight relationship as a system of equations to account for possible simultaneity bias between the two dependent variables, external debt and capital flight.

The specification of the relationship is depicted in equations (2) and (3). The literature on capital flight identifies external debt, interest rate differentials, budgetary deficits and overvalued exchange rates as important determinants of capital flight. Research has also documented the influence of these same variables in determining a country's external indebtedness (see Conesa, 1987; Erbe, 1985; Cuddington, 1986; Pastor, 1988; Boyce, 1992; Henry, 1996).

The model estimated is as follows:

$$KF_t = a_0 + a_1 (KF_{t-1}) + a_2(ED_{t-1}) + a_3 (BD_{t-1}) + a_4 (RES_{t-1}) + a_5(INT_t) + a_6(DUMMY_t) + \omega_t \quad (2)$$

$$ED_t = b_0 + b_1(KF_{t-1}) + b_2(ED_{t-1}) + b_3(BD_{t-1}) + b_4(RGDPGR_{t-1}) + b_5(INT_{t-1}) + b_6(DUMMY_t) + \phi_t \quad (3)$$

In equations (2) and (3) the subscript *t* refers to the years 1980-2001; *KF* is the residual estimate of capital flight in Nigerian Naira; *ED* refers to net debt disbursement in naira. *RES* is the level of the country's foreign exchange reserves (in dollars); *RGDPGR* is the percentage rate of growth of real gross domestic product; *INT* is the difference between US and domestic real interest rates; *BD* is the government's budget deficit as a percentage of gross domestic product; and *DUMMY* is a constructed dummy variable that takes the value of 0 prior to 1986 and 1 thereafter. An explicit policy reorientation towards the liberalisation of the Nigerian economy was adopted in July 1986 following a structural crisis in 1980s. Annual data series for the period 1970 to 2001 are sourced from International Financial Statistics (IFS) and Statistical Bulletin of the Central Bank of Nigeria publications.

In keeping with the theoretical literature discussed above, *ED* is expected to have a positive association with *KF* in equation (1) (the capital flight equation). In addition, a positive and significant a_2 would validate the existence of a contemporaneous liquidity effect where external debt directly provides the resources for individuals to engage in capital flight. It is expected that the level of a country's foreign exchange reserves (*RES*) would be negatively associated with the capital flight. Higher reserves, *ceteris paribus*, indicate a lower likelihood of an impending fiscal crisis and reduced incentive for *KF* in the next year. On the other hand, the variable *INT*, the difference between the US and the Nigerian real domestic interest rates, is expected to have a positive association with capital flight, the higher the interest rate differential, the greater the incentive for capital flight. The policy-induced liberalisation of the Nigerian economy is expected to reduce the incentive for capital flight. Hence, the dummy variable should have a negative coefficient. The sign on the government budget deficit (*BD*) variable is ambiguous. On the one hand, a positive *BD* coefficient suggests that higher budget deficits may prompt increased capital flight due to increased risk of a fiscal crisis. On the other hand, an increasing budget deficit may result in reduced capital flight if such deficits are associated with greater public investment and the "crowding-in" of private capital. In such a situation, one would obtain a negative correlation between *BD* and *KF*. The relative strengths of these two opposing effects would therefore determine the sign on the *BD* variable.

Turning next to the expected signs of the explanatory variables in equation (2) (the external debt equation), the theoretical discussion in Section 3 suggests a positive association between *KF* and *ED*. Moreover, a positive and significant b_1 would indicate that capital flight can provide the fuel required by the private sector to engage in "round-tripping" of capital. Again, the sign of the coefficient on the *BD* variable is uncertain. While higher budget deficits may increase the demand for external borrowing, these may also reduce the supply of foreign credit to a country. The direction of the net impact depends, therefore, on the relative strengths of these two opposing forces. The expected sign of the coefficient on *RGDPGR* is also uncertain. Supply-side considerations are straightforward; a higher GDP growth rate is expected to increase the supply of foreign credit to a country. The impact on the demand for external credit, however, is ambiguous; public sector demand for external borrowing may decline while private sector (investment) demand may be enhanced as a result of higher growth rates. The sign of the coefficient for *INT* will also be a function of the relative strengths of demand and supply forces. The higher the value of *INT*, the differential between the real interest in the US and that in the Nigerian economy, the lower the demand for external finance and the higher the supply of debt. The sign on the dummy variable is expected to be either positive or negative. A

positive sign would suggest an increased supply of foreign credit because of economic liberalisation. A negative sign, on the other hand, would reflect a reduced demand for external borrowing. This can occur for two reasons. First, economic liberalisation reduces the incentive for capital flight and the possibility of a flight-driven demand for external debt (i.e. where debt essentially replaces capital that has flown out). Second, economic liberalization can increase the inflow of foreign direct investment (FDI) and, consequently, reduce the demand for external borrowing. The sign and joint significance of a_2 and b_1 would enable a testing of the existence of contemporaneous causality between *ED* and *KF*, consistent with the financial revolving door hypothesis discussed earlier.

Although, by now, there is compelling evidence that many macroeconomic time series are non-stationary and, as a result, OLS estimates using these data may produce spurious results. Valid inference is possible when non-stationary variables are co integrated and estimated via vector error correction (VECM) or vector auto regression. However, a vector auto regression (VAR) arises when there are no restricted Z variables that are assumed at least weakly exogenous for the endogenous variables (Doornick & Hendry, 2001). This makes our present model not amenable to vector auto regressions, because two categories of non-modelled variables exists in our present model, these are the restricted (GDPGR, RES), and the unrestricted (constants and dummy) variables.

Thus, to allow for simultaneity between the two endogenous variables KF and ED, the system of equations was estimated by using the three-stage least squares (3SLS) estimation method. A fundamental assumption of regression analysis is that the right-hand side variables are uncorrelated with the disturbance term. This assumption is violated, for instance, as in our systems of equations, when there are endogenously determined variables on the right-hand side of the equation, in this situation, both OLS and weighted LS are biased and inconsistent.

The standard approach in cases where right-hand side variables are correlated with the residuals is to estimate the equation using instrumental variables regression. The idea behind instrumental variables is to find a set of variables, termed instruments, which are both (1) correlated with the explanatory variables in the equation, and (2) uncorrelated with the disturbances. These instruments are used to eliminate the correlation between right-hand side variables and the disturbances. Three-stage least squares (3SLS) is a special case of instrumental variables regression and it is an appropriate technique when right-hand side variables are correlated with the error terms, and there is both heteroskedasticity and contemporaneous correlation in the residuals.

5
Analysis of empirical results

To explore the long-term relationship between our model variables, the Johansen co integration test was applied. This was after the order of integration of individual variables has been determined through the use of Augmented Dickey Fuller (ADF) tests of unit roots. The Johansen (1988) method confirmed the existence of a long-term relationship between the endogenous variables *KF* and *ED* and their respective explanatory variables at the 5 per cent level of significance.

Table 2 presents the results of the 3SLS estimation of model equations. The residuals from the 3SLS estimation were tested for first and second order serial correlation by Breusch and Godfrey LM test. The presence of autoregressive heteroskedasticity is also tested by Engle-LM test. Normality assumption is tested by Jarque-Bera test statistics. These tests confirmed that the residuals did not violate any of the classical assumptions. The overall results suggest the existence of significant contemporaneous correlation between debt and capital flight. In both the capital flight and the external debt equations, the coefficients on the endogenous variables (*ED* and *KF* respectively) are positive and significant. The results obtained quite clearly validate the hypothesis

of bi-directional, contemporaneous relationship between debt and capital flight. Thus, the nature of the association between debt and capital flight in Nigeria is characterised by a financial revolving door, where external debt and capital flight fuel each other by providing capital for the reverse flow. This result is quite in line with the findings of Boyce (1992) on Philippines; as well as Chipalkatti and Rishi (2001) and Firar Demir (2004) for India and Turkey respectively. It however contradicts Ajayi (1997), who failed to establish the flight-driven external borrowing hypothesis. A plausible explanation for this is that while this study is country-specific, Ajayi (1997) only included Nigeria in panel data regressions. In addition, he differs significantly with respect to the methodological approach of this study.

Table 2

The relationship between capital flight and external debt flows

A: Capital Flight Equation

Estimation Method: Three-Stage Least Squares

Equation: KF = C(1) + C(2)*KF(–1) +C(3)*ED(–1) +C(4)*BD(–1) + C(5) *FR(–1) + C(6)*INT(–1) + C(7)*DUMMY + RESID

Variable	Coefficient	Std. Error	t-Statistic	Elasticities
Constant	82820.76	5473.357	15.13162	0.0000
KF(–1)	0.103757	0.044947	2.308418	0.11
ED(–1)	0.074245	0.026859	2.764239	0.27
BD(–1)	–0.140851	0.262007	–0.537585	–0.02
FR(–1)	0.397958	0.472169	0.842831	0.36
INT(–1)	–1784.410	0.001150	–2.053268	–0.08
DUMMY	795.2622	9469.138	0.083985	
Determinant residual covariance		3.44E+08		

R-squared	0.997926	Mean dependent var	143319.1
Adjusted R-squared	0.997303	S.D. dependent var	415009.3
S.E. of regression	21551.02	Sum squared resid	9.29E+09
Durbin-Watson stat	1.990832		

B: External Debt Equation

Estimation Method: Three-Stage Least Squares

Equation: ED = C(1) +C(2)*ED(–1) + C(3)*KF(–1) + C(4)*BD(–1) + C(5) *RGDPGR(–1) + C(6)*INT(–1) + C(7)*DUMMY + RESID

Variable	Coefficient	Std. Error	t-Statistic	Elasticities
Constant	120610.0	74077.52	1.628160	0.0000
ED(–1)	1.450283	0.488774	2.967183	1.45
KF(–1)	0.943493	0.180827	5.217666	0.26
BD(–1)	9.272536	2.274755	4.076280	0.39
RGDPGR(–1)	1862.681	6927.021	0.268901	0.02
INT(–1)	9376.039	11102.96	0.844463	0.11
DUMMY	–235407.6	104763.1	–2.247046	
Determinant residual covariance		8.26E+10		

R-squared	0.836905	Mean dependent var	376414.2
Adjusted R-squared	0.794359	S.D. dependent var	723770.0
S.E. of regression	328212.8	Sum squared resid	2.48E+12
Durbin-Watson stat	1.906288		

In order to interpret the economic meaning of the coefficients, elasticities have also been computed. Elasticities are calculated as the product of the coefficient and the mean of the independent variable divided by the mean of the dependent variable (Pindyck & Rubinfeld, 1981: 91). Elasticities are useful in interpreting the effect of a percentage change of an independent variable on the dependent variable, especially because they are unit-free measures. From Table 2 it is apparent that a percent increase in net real debt disbursements is associated with approximately a 0.02 per cent increase in real capital flight. This provides support for the hypothesis that external borrowing can directly cause capital flight by providing the necessary liquidity. Likewise, a percent increase in real capital flight is significantly associated with a 0.26 per cent increase in net real debt disbursements. Again, this finding is suggestive of a possible round tripping of capital where flown resident capital re-enters the country in the guise of an external loan. Taken together, the elasticity results in Table 2 reinforce the fact that during 1970 and 2001 capital flowed into and out of the Nigerian economy through a financial revolving door.

The coefficient of the BD variable turned out negative and significant. This supports the supply side arguments about credit availability, which suggest that the existence of high public sector deficits discourage further capital inflows for the rollover of the debt, hence have a reverse effect on capital flight by reducing the pool of foreign creditors for lending. The computed elasticity for this variable suggests that a one per cent decrease in budget deficit variable is associated with an approximately two per cent increase in capital flight.

Unexpectedly, the relationship between interest rate differential and capital flight turned out negative, but significant. One possible explanation for this may be the shortness of interest rate movements, in contrast to arbitrage seeking hot money flows, changes in interest rates overnight may not be expected to effect annual capital flight variables. In contrast to expectation, neither the foreign exchange reserve variable nor the economic reform programme implemented since 1986 had significant explanatory power in our capital flight estimates.

Turning to the external debt equation, the government budget deficit variable, *BD*, is positively and significantly associated with debt disbursements. This highlights the relative importance of demand-side factors in the market for external credit: higher budget deficits increase the demand for external capital. The computed elasticities suggest that a percent increase in the *BD* variable is associated with a 0.39 per cent increase in net debt disbursements. GDPGR variable turned out to have a positive and significant effect on external debt disbursements. This supports the thesis regarding demand and supply side arguments that higher growth rates increased the demand for foreign funds to finance growing investment and consumption levels in the country. Increasing growth rates may also be instrumental in increasing the pool of creditors for lending due to improving creditworthiness. Table 2(B) reports that a percentage increase in the real growth rate of the Nigerian economy is associated with a 0.02 per cent increase in net debt disbursements.

The negative and significant coefficient on the dummy variable is also as expected for reasons discussed earlier. The economic reforms of 1986 onwards have led to a tremendous increase in non-debt inflows such as FDI, which may have resulted in a significant decline in the demand for external borrowing.

Two-way Granger causality tests were also conducted for KF and ED. Granger causal estimation requires stationarities of the variables involved. Where non-stationarities were observed the variables were first-differenced during the course of estimation. The Langrange multiplier test was employed to check for serial

correlation. The instrument variable (IV) models reported below were independently estimated by an ordinary least squares (OLS) procedure for the KF and ED variables:

$$KF_t = \underset{(3.68)}{123.75} + \underset{(11.68)}{0.32^*(KF_{t-1})} + \underset{(21.22)}{0.69^*(EDINST)_t} + \underset{(5.9)}{1.89^*(EDINST)_{t-1}} - \underset{(-4.87)}{132.66^*(INT)_{t-1}}$$
$$+ \underset{(6.23)}{52.18^*(\Delta GDPGR)_{t-1}} + \underset{(5.53)}{211.54^*(\Delta BD)_{t-1}} - \underset{(-4.21)}{0.22^*(RES)_{t-1}} + E_t$$

Adjusted R^2 =78; *F*- statistic: 121.3 (significant at $p < 0.05$ levels)

$$DD_t = \underset{(-1.46)}{1432.79} - \underset{(-4.78)}{0.22^*(DD_{t-1})} + \underset{(11.19)}{0.74^*(KFINST)_t} - \underset{(-3.19)}{0.29^*(KFINST)_{t-1}} - \underset{(-2.17)}{141.63^*(INT)_{t-1}}$$
$$+ \underset{(0.23)}{25.18^*(\Delta GDPGR)_{t-1}} - \underset{(-1.53)}{1211.54^*(\Delta BD)_{t-1}} - \underset{(-6.81)}{0.017^*(RES)_{t-1}} + E_t$$

Adjusted R^2 =89; *F*- statistic: 63.8 (significant at $p < 0.05$ levels)

The variables remained as defined in the paper. The 'Δ' symbol implies first differencing. "INST" refers to the instrumental variable estimate for the relevant dependent variable, where other lagged variables were used as instruments to derive an estimate for KF and ED. The figures in parentheses represent the t-statistics for the relevant variables

As shown in the parameter estimates above, the results of the two-way Granger causality tests clearly confirm that there is a statistically significant bi-directional causality between capital flight and net external indebtedness in the Nigerian economy. Another important insight provided by the test is that external debt determines capital flight more significantly. This confirmed the theses that external borrowing provides resources necessary to effect flight, which further fuel the external borrowing need of the country.

6
Concluding remarks and policy implications of findings

This paper investigates and validates the existence of a bi-directional, contemporaneous relationship between external debt flows and capital outflows in the Nigerian economy. In addition, existence of stronger causality from debt to capital flight is instrumental in showing that a growing public deficit and the resulting increase in external debt is being used as a transfer mechanism for capital flight.

The establishment of the revolving door relationship between external debt and capital flight has important policy implications for the country. This finding implies that the flows directly fuel one another by providing capital for each other. Responsibility for the diversion of borrowed funds lies on both corrupt government functionaries (past and present) and foreign creditors, including private bankers as well as bilateral and multilateral institutions. Deliberately or otherwise, these creditors financed the accumulation of private assets with loans purportedly meant for national social economic development.

A policy suggestion for external debt management from this is to insist that foreign creditors be made to bear the consequence of imprudent lending, while government should accept liability for only those portions of public debts incurred by past regimes that were used to finance bona fide development programmes. In addition, government should establish mechanisms of transparency and accountability in its decision-making processes with regard to foreign borrowing and the management of borrowed funds. Greater accountability on the part of both borrowers and creditors is needed to prevent repeated cycles of external borrowing, capital flight, and financial distress.

The insignificance of the economic reforms dummy variable in the capital flight equation points to the fact that liberalisation programmes of the mid 80s did not lead to a radical change in the behaviour of private agents

in terms of size of capital flight. However, continued liberalisation of the economy is useful in lowering the demand for external borrowing. Given the strong and mutually reinforcing correlation between external debt and capital flight, this may in turn, prompt a reduction in flight capital outflows.

Endnotes

[1] Naira and Kobo are the units of the Nigerian currency. 100 kobo makes a naira.
[2] This section draws from *N. Chipalkatti & M. Rishi* (2001)

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