An Econometric Analysis of Capital Flight from Nigeria: A Portfolio Approach

By

Akanni O. Lawanson
Department of Economics
University of Ibadan
Nigeria

AERC Research Paper 166
African Economic Research Consortium, Nairobi
May 2007

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are those of the author, however, and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

Printed by: Modern Lithographic (K) Ltd.
P.O. Box 52810-City Square
Nairobi 00200, Kenya

ISBN 9966-778-10-1

Contents

List of tables

List of figures

Abstract

This study provides measures of real capital flight from Nigeria based on the residual method adjusted for exchange rate fluctuations and trade misinvoicing. The portfolio choice approach is explored, in which the flow of capital is accumulated into stock and expressed as ratios of private stock of real wealth. Econometric analysis of capital flight, based on a portfolio choice framework, was conducted using the ordinary least squares (OLS) method of analysis. The results of the econometric analysis reveal that a number of factors systematically explain the portfolio behaviour of private wealth holders in Nigeria. These factors are consistent with earlier studies and include real GDP growth, real interest rate differential, parallel market exchange rate premium, inflows of debt-capital, domestic debt, fiscal deficit and change in inflation rate.

1. Introduction

Over the years, the issue of capital flight from developing countries, including Nigeria, has received appreciable attention from researchers. Concerns have been expressed about the magnitude, causes and consequences of these capital outflows, not least because the lack of financial resources for appropriate economic development has pushed Nigeria and most other sub-Saharan African (SSA) countries into external borrowing to augment domestic resources in their quest for economic growth. Acquisition of foreign assets by residents has escalated even as developing countries search for external borrowings to enhance the inflow of resources. Authors like Cuddington (1987) and Pastor (1990) have shown that developing countries' borrowing is substantially diverted into private assets abroad. Thus, the paradoxical situation of accumulation of external debt by developing countries and the corresponding acquisition of external assets by residents has been an additional motivation behind the interest on capital flight.

Capital flight from developing countries, including Nigeria, not only aggravates the shortage of resources for development, it indirectly leads to a decline in domestic investments as well as a reduction in the potential tax receipts of the governments. The sluggish growth and persistent balance of payment (BOP) deficits in most developing countries, despite private transfers and long-term capital inflows, have been attributed to capital flight (Ajayi, 2000). Growth is reduced partly because investment has been diverted abroad and also because necessary imports are limited by the foreign exchange drain from both the flight itself and the fact that earnings on such assets are often not repatriated (Pastor, 1990).

For developing countries to ride in the fast lane of the growth process, and elicit support from international financial institutions, there is need for urgent policy action to reverse the capital outflows from their economies. Thus, a better understanding of the extent of past capital flight from Nigeria, as well as reliable measures to achieve possible capital flight reversals, may be a useful starting point in the realistic assessment of the prospects for renewed investment and growth in Nigeria.

Objectives of the study

Broadly, the objective of this study is to estimate capital flight from Nigeria as a portfolio choice, and to investigate its determinants. Specifically, the objectives are to:

- Measure capital flight from Nigeria using varieties of the residual method.
- Accumulate capital flight flow estimates into stocks.

- Provide portfolio expression of real capital flight estimates as ratio of stock of private real wealth.
- Identify factors influencing portfolio choice of private wealth holders in Nigeria.

Justification for the study

At the inception of the current civilian government in Nigeria in 1999, a campaign for external debt relief from Nigeria's foreign creditors and a bid to attract foreign investment were launched as cardinal goals in the pursuit of economic growth and better living conditions for Nigerians. The policy direction was informed by the belief that the country's debt burden and inadequate inflow of investment capital were strong hindrances to the growth of the economy. When that government assumed office in 1999 the ratio of Nigeria's external debt to GDP was as high as 84% and the domestic debt/GDP ratio was 25%. On the investment flow side, the net flow of foreign private capital declined by more than 92% in 1999.

Basically, a large volume of capital flight is considered as evidence of excessive taxation and economic mismanagement in the home country. It casts doubts about debt relief as an appropriate response to the debt-service problem (Eggerstedt et al., 1995) and sends wrong signals to investors. A recent study by Boyce and Ndikumana (2001) reports that as much as US$3.5 billion flew out of Nigeria in 1996. In the light of the external debt burden of the country, the recently approved debt relief by the Paris Club and the urge to reverse capital flight in the process of economic growth, this study is a starting point in providing new and more recent insights into the issue of capital flight from Nigeria, and possible policy measures or strategies to reverse the trend.

International capital movements have grown since the financial deregulation of the 1980s experienced in Africa and the adoption of the structural adjustment programme in Nigeria in 1986. The initial sentiment was that removal of capital control would lead to only a one-off adjustment. This has been unsupported by evidence, while large-scale unrecorded capital flights have hit a number of developing countries. In the particular case of Nigeria, capital flight has been a recurrent phenomenon and was estimated to be taking place even before the adoption of the structural adjustment programme in 1986. Could it perhaps be that capital flight has continued unabated even under democracy?

The literature on capital flight from Nigeria[1] is quite extensive and the econometric analysis of the same has been handled in a number of existing studies.

Onwioduokit (2001) and Ajayi (1992) focused only on Nigeria, while others included Nigeria as one of a number of countries. The studies measure the magnitude of the flow of capital flight from Nigeria using various measurement techniques. Measures obtained covered different periods of time, with the most updated estimates of capital flight by Boyce and Ndikumana (2001) terminating in 1996. Econometric analyses of the determinants of capital flight in Nigeria have also been undertaken by a number of these studies. Given the frontier of knowledge provided by the existing studies, the contributions of this study on Nigeria are threefold.

First, this study is based on a portfolio choice approach, which represents a clear departure from the existing studies on capital flight in Nigeria. A portfolio choice analysis allows us to assess the capital flight decisions of private agents within the context of the

total private wealth. The proportion of private wealth held abroad is considered. Second, all the existing studies on capital flight from Nigeria measured capital flight as a flow variable; this study goes a step further to accumulate it into annual stock variable. This study also provides measures based on different methods that have been proposed in the literature. Third, the study provides an update on the available measures of capital flight from Nigeria in the literature. Both the macroeconomic and political climates in Nigeria have changed significantly in recent times and the relevance of the conclusions of past studies to current policy decisions may be faulty. In view of the adverse implications of capital flight, providing insight into possible strategies to effect capital flight reversal is crucial at this time.

Scope and data sources

The study covers the period from 1970 to 2001. The data used were sourced from the International Monetary Fund's International Financial Statistics, the 2003 Direction of Trade Statistics CD-ROM, and the 2002 Balance of Payment Statistics CD-ROM; World Bank World Debt Table and Global Development Finance; International Financial Corporation Discussion Papers (various issues), and African Development Indicators. Nationally, information was drawn from the Annual Report and Statement of Accounts and Statistical Bulletin of the Central Bank of Nigeria. The CD-ROM versions listed above were supplemented by various years' hard copy issues.

2. Review of related literature

Quite a number of issues have been the focus of debate in capital flight studies. The discourse ranges from definition and measurement issues, to queries about the causes of capital flight and appropriate policy measures to achieve a reversal of the trend.

Some definitional issues

Despite the prevalence of the topic, the understanding of the term "capital flight" in the literature remains unsettled. The definitions associated with the concept of capital flight are divergent, with varieties of meanings implied, and the word "flight" itself used to connote illegal movement of capital from one country to another. At the broad extreme, it has been defined to include all private capital outflows from developing countries (Kahn and Ul Hague, 1987), while at the narrow extreme it includes only illegal capital exports (Lessard and Williamson, 1987). The broad perspective takes into consideration all private capital outflows from an economy. By this definition, all private capital outflows from developing countries, be they short term or long term, portfolio or equity investments, could be termed capital flight. This is because developing countries are generally considered to be short of capital and should therefore be net borrowers in the development process, supplementing domestic savings with external finance. Thus, Kindleberger (1987) and Walter (1987) broadly define capital flight as all capital that "flees" irrespective of the motive. Similarly, Morgan Guaranty Trust Company (hereafter Morgan Trust, 1986) defines capital flight as the reported and unreported acquisition of foreign assets by the non-bank private sector and some elements of the public sector. Loosely put, Eggerstedt et al. (1995) define capital flight as the unreported private accumulation of foreign assets. Alternatively, capital flight can be considered as the change in the private sector's net foreign assets (World Bank, 1985; Erbe, 1985; Morgan Trust, 1986; Chang and Cumby, 1991).

In contrast, some researchers regard only short-term outflows resulting from economic and political uncertainties in the home country as capital flight. In other words, it is money that is fleeing from the country rather than external investment guided by long-term economic considerations. In practical terms, therefore, capital flight could be defined as the difference between total private capital outflows and the part for which interest income is identified and reported (Kahn and Ul Hague, 1987). While in general, all capital flows are motivated by individual or corporate desires to maximize returns on capital for a given level of risk, the motivation for capital flight is more specific (Ojo, 1992).

The major constraint to consensus on a definition of capital flight can also be traced to the difficulties involved in distinguishing between those flows that can be considered "normal" and those that fall into the category of "flight" capital. Normal capital outflows are defined as the *legal* capital outflows, while all capital outflows based on the desire to place assets beyond the control of domestic authorities are labelled capital flight (Dooley, 1988). However, separating flight capital from normal portfolio diversification and trade transactions is fraught with difficulties (Eggerstedt et al., 1995) and could involve some element of value judgement (Ojo, 1992), which explains in part the variations in definitions of capital flight.

Methods of measuring capital flight flows

It is little wonder, then, that the measurement of capital flight also remains a subject of dispute (Eggerstedt et al., 1995). The multiple definitions of capital flight in the literature have given rise to a range of approaches to its measurement. The measurement of capital flight is usually based on the definition adopted, and whether distinction is made between normal capital flows and flight capital flows.

Thus, a number of measures of capital flight can be found in the literature. Murinde et al. (1996) identified four major methods: residual method; Dooley method; hot money method; and asset (or mirror stock statistics) method. Boyce and Ndikumana (2001) and Ajayi (1997) identified accounting for "trade-faking" activities as additional methods of measuring capital flight. The starting point for all measures is the balance of payments figure.

The residual method appears to give a rather straightforward calculation of capital flight, and this may be responsible for its being the most widely accepted and applied method in the literature. The residual method not only considers all private capital outflows as capital flight, it also compares the sources and uses of such capital flows. This suggests that for the non-existence of capital flight the sources must be equal to the uses of capital inflows. The net increase in external debt *(EXD)* and the net inflow of foreign investment *(FIT)* as sources are compared with the current account deficits *(CAD)* and additions to foreign reserves *(FRS)* as uses. If the sources exceed the uses of capital inflows, the difference is termed capital flight. Thus, the residual method, in a simple equation form, measures the magnitude of capital flight as:

$$CF_t = \Delta EXD_t + \Delta FIT_t - CAD_t - \Delta FRS_t \quad (1)$$

where Δ represents change and CF denotes capital flight.

While the residual method has been used in its basic form in some studies, others have empirically applied it with some modifications. The basics of the residual method are used in World Bank (1985) and Erbe (1985), while Morgan Trust (1986) and Murinde et al. (1996) applied a modified form by including the change in the foreign assets of the domestic banking system. In their modification, increase in claims of domestic banks on foreign banks is subtracted from capital flight estimations based on the residual method.

The Dooley method defines capital flight as illegal capital outflows, or all capital outflows based on the desire to place assets beyond the control of domestic authorities. Following this concept of capital flight, the Dooley method considers all outflows that do

not receive and/or register interest payments as illegal capital outflows. The Dooley measure incorporates the net errors and omissions, as well as the difference between the World Bank data on the annual change in the stock of external debt and debt flows as reported in the balance of payments statistics. In its simplest form, capital flight magnitude is measured as the excess of total capital outflows over the stock of registered interest-receipt external assets.

The total capital outflow is computed as:

$$CO_t = \Delta EXD_t + \Delta FIT_t - CAD_t - \Delta FRS_t - \Delta DWI_t - NEO_t \quad (2)$$

where *CO* denotes total capital outflows, *NEO* is net errors and omissions, and *DWI* represents the difference between the World Bank and IMF debt statistics.

The stock of total external assets *(STEA)* is computed as:

$$STEA_t = (1 + r_w)\, RR_t \quad (3)$$

where r_w stands for internationally realistic interest rate, and *RR* is the registered receipts.

From equations 2 and 3, the Dooley measure of capital flight (CF^d) is calculated as:

$$CF^d_t = CO_t - STEA_t \quad (4)$$

The hot money measure views capital flight as the capital outflows responding to short-term variations in the various domestic and international financial market conditions. In order to account for the non-registered short-term capital flows, the net errors and omissions are included. This method measures capital flight as the sum of short-term capital outflows and the net errors and omissions. Therefore, the hot money measure of capital flight can be stated as:

$$CF^h_t = STC_t + NEO_t \quad (5)$$

where CF^h represents hot money capital flight. Studies that have applied this method include Cuddington (1986) and Ketkar and Ketkar (1989). One very important drawback of this method is that it fails to consider long-term capital outflows when capital flight is measured (Murinde et al., 1996). Against the background of its exception of "speculative" money, Ajayi (1992) argued that there is no justification for leaving out other parts of capital flight that can be considered as "speculative" money.

Another measure is the asset method, which represents a direct approach to the measurement of capital flight. It measures capital flight as the change in cross-border bank deposits of non-banks by residence of depositor. The annual flow of capital flight is measured as the change in the total assets of non-bank residents held in foreign banks, which is directly available from IMF's IFS. This method is characterized by a number of shortfalls. According to Ajayi (1997), it fails to capture the fact that substantial amounts are held in assets other than bank deposits, and that bank deposits may be held outside the major financial centres. More so, the identity (name and nationality) of the depositors is concealed in some banks.

Capital flight from Nigeria

Many studies have confirmed the existence of substantially larger capital flight from Nigeria in absolute and relative terms than that from other sub-Saharan African countries. Using a modified version of the residual method, Morgan Trust (1986) was the first study on capital flight to include Nigeria, along with other developing countries from Asia, Latin America and Africa. The study established the incidence of capital flight from Nigeria in the second half of the 1970s and first half of the 1980s. Using the narrower non-bank definition proposed by Morgan Trust (1986), and the asset method, Hermes and Lensink (1992) measured capital flight from Nigeria along with five sub-Saharan African countries over the period 1976 to 1989. Their measures indicate that Nigeria experienced the largest capital flight of US$21 billion, representing 60% of the combined total for the six countries in the sample. In another study (Ojo, 1992), the cumulative capital flight from 1975 to 1991 was determined to be in excess of US$35.9 billion, being more than double the total of the other two African countries (Côte d'Ivoire and Morocco) in the sample. Similarly, a cross-country study by Chang and Cumby (1991) on capital flight from 36 sub-Saharan African countries from 1976 to 1987 found Nigeria to be the only country in the group with an absolute level of capital flight greater than those from Latin America countries.[2]

Claessens and Naude (1993), using the World Bank residual measure to estimate capital flight from 84 countries over the period 1971 to 1990, concluded that Nigeria had the seventh largest annual average outflows of capital and was sixth in terms of the ratio of capital flight to GDP. Relative to external borrowing, Nyatepe-Coo (1994) found capital flight from Nigeria to be in excess of 90% between 1970 and 1992. Similarly, the Ajayi (1997) study of capital flight from 18 severely indebted low-income countries in sub-Saharan Africa over the period 1980 to 1991 found cumulative capital flight as percentage of external debt to be 94% for Nigeria. Boyce and Ndikumana (2001) concluded that evidence presented on capital flight indicates that Nigeria is an egregious example of a more widespread phenomenon in the subcontinent.

3. Method of analysis and results

The methodology for this study is based on a portfolio choice approach to the analysis of capital flight estimates. It involves the estimation of capital flight flows and the accumulation of the same into stock, which is subsequently expressed as a proportion of private stock of real wealth. In this section, we provide an overview of the steps that culminated in the construction of capital flight portfolio variables and present all the estimates obtained along the line. Also, an econometric specification of the determinants of the proportion of stock of private wealth in Nigeria that is held abroad is described and the results discussed.

Estimates of capital flight flows

Given the straightforward calculation of capital flight associated with the residual method,[3] the latter remains the most widely used method in the literature. As noted above, this method generally measures capital flight as the difference between total capital inflows and recorded capital outflows. To estimate capital flight for Nigeria in this study, two versions of the residual method are utilized, one based on the World Bank/ Erbe (1985) version and the other on the Morgan Trust (1986) version. The difference between the two methods is that the Morgan Trust version incorporates changes in foreign assets of the banking system as an indication of capital flight. All other elements of the computation are the same for the two.

$$World\ Bank:\ CF(WB)_t = FDI_t + \Delta_t DEBT - (CAD_t + \Delta TRESG_t) \quad (6)$$

$$Morgan\ Trust:\ CF(MT)_t = FDI_t + \Delta_t DEBT + \Delta_t FAB - (CAD_t + \Delta TRESG_t) \quad (7)$$

where *CF(WB)* and *CF(MT)* are capital flight estimates based on the World Bank and Morgan Trust versions of residual method, respectively, while *FDI* and *DEBT* are the net foreign direct investment and external debt stock, respectively. *TRESG* and *CAD* stand for total reserves minus gold and the current account deficit, respectively. *FAB* represents foreign assets of banking system.

Adjusting debt figures for exchange rate fluctuations

World Bank debt data are reported in a common currency (US dollars), but most countries, including Nigeria, hold debts denominated in a number of different currencies. Using the end-of-year exchange rates, the varieties of currencies in which the debts are denominated are converted to common denomination of US dollars as the World Bank data on debt stocks. Thus, part of the variations in the debt stock is due to exchange rate fluctuations of these currencies. The effect of exchange rate fluctuations on the US dollar value of the stock of long-term debt is accounted for by adjusting for these fluctuations in the dollar denominated debt stock data of the World Bank.

Following Boyce and Ndikumana (2001), we derive the series for adjusted external debt figure on the basis of the following equations:

$$\Delta ADJDEBT_t = DEBT_t - NEWDEBT_{t-1} \quad (8)$$

where $NEWDEBT_{t-1}$ stands for the exchange rate fluctuation adjusted external debt computed as:

$$NEWDET_{t-1} = \sum_{i=1}^{7}\left[\frac{\alpha_{i,t-1} * LDBT_{t-1}}{EX_{i,t} / EX_{i,t-1}}\right] + LTOT_{t-1} + LTMT_{t-1} + LTUS_{t-1} + SDBT_{t-1} \quad (9)$$

where *LDBT* is the total long-term debt; a_1 is the proportion of long-term debt held in currency *i* for each of the seven[4] non-US currencies; and *EX* is the end-of-year exchange rate of the currency denominated against the dollar expressed as units of currency per US dollar. *LTOT* and *LTMT* are long-term debt denominated in other currencies and multiple currencies, respectively. *LTUS* is long-term debt denominated in the US dollar and *SDBT* is short-term debt. The use of IMF credit is exempted from Equation 8 because Nigeria does not use this facility.

The data used in the computation of the adjusted debt figure are presented in tables 1 and 2. The data include series on the currency composition of Nigeria's external debt in percentages (Table 1), exchange rates of the Nigerian debt denominated currencies to one US dollar, long- and short-term external debts, as well as the new debt and adjusted debt figures obtained (Table 2). The necessary series as stated in Table 3 were computed on the basis of equations 8 and 9.

Following the adjustment for exchange rate fluctuation effect on the external debt stock figure, the earlier stated equations 6 and 7 for capital flight measures based on World Bank and Morgan Trust residual methods become equations 10a and 10b, respectively, as follows:

$$CF(WB)_t = FDI_t + \Delta ADJDEBT_t - (CAD_t + \Delta TRESG_t) \quad (10a)$$

$$CF(MT)_t = FDI_t + \Delta ADJDEBT_t + \Delta FAB - (CAD_t + \Delta TRESG_t) \quad (10b)$$

where the variables are as defined earlier.

With the new series of adjusted debt derived in equations 10a and 10b, the modified equations 6 and 7 used to compute the residual measure of capital flight adjusted for exchange rate fluctuations are reported in Table 3.

The nominal estimates of capital flight from Nigeria between 1970 and 2001, based on the World Bank and Morgan Trust versions of residual method, are reported in the last two columns of Table 3, respectively. The positive sign, which means the recorded sources of foreign exchange actually exceeded the uses, implies there is capital flight, while a negative sign indicates reparation of part of previous capital flight. The results from the two capital flight estimates are not significantly different from one another.

Table 1: Currency composition of Nigeria's debt in percentage

Year	Deutsche mark	Euro	French franc	Japanese yen	Pound sterling	Swiss franc	SDR	US dollar	Multiple currencies	All other currencies
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10
1970	9.0	0.0	0.0	0.8	30.4	0.3	0.0	9.9	38.5	11.1
1971	6.7	0.0	0.2	2.3	26.8	0.2	0.0	14.8	38.6	10.4
1972	5.8	0.0	0.6	2.0	20.5	0.1	0.0	16.8	41.5	12.7
1973	4.1	0.0	0.5	1.3	11.9	0.1	0.0	10.7	63.4	8.0
1974	5.9	0.0	0.4	1.2	11.9	0.0	0.0	10.0	62.5	8.1
1975	5.7	0.0	0.5	4.0	11.5	0.0	0.0	11.4	57.6	9.3
1976	6.9	0.0	2.1	5.6	12.9	0.0	0.0	13.9	45.8	12.8
1977	7.3	0.0	3.2	6.8	11.9	0.0	0.0	11.0	48.2	11.6
1978	3.1	0.0	1.1	3.5	4.4	0.0	0.0	64.3	19.4	4.2
1979	16.2	0.0	0.9	2.0	3.0	0.0	0.0	59.1	14.7	4.1
1980	23.5	0.0	0.9	2.0	2.7	0.4	0.0	55.0	12.1	3.4
1981	25.0	0.0	2.2	1.3	1.6	2.2	0.0	53.4	10.0	4.3
1982	23.6	0.0	6.4	3.2	3.1	1.9	0.0	49.3	8.3	4.2
1983	14.8	0.0	4.7	3.5	5.6	1.5	0.0	59.4	7.4	3.1
1984	13.5	0.0	4.3	3.3	8.0	1.4	0.0	57.5	8.5	3.5
1985	13.1	0.0	5.8	7.5	7.9	1.4	0.0	48.8	11.1	4.4
1986	14.6	0.0	7.5	7.4	10.7	1.6	0.0	40.2	11.9	6.1
1987	13.5	0.0	6.2	7.8	11.6	1.6	0.0	36.6	17.6	5.1
1988	11.8	0.0	5.5	8.1	11.2	1.3	0.0	41.3	16.4	4.4
1989	12.2	0.0	8.7	8.1	10.8	1.1	0.0	43.7	9.9	5.5
1990	14.8	0.0	9.0	8.2	11.8	0.7	0.0	38.8	10.4	6.3
1991	14.6	0.0	10.4	9.4	12.3	0.7	0.0	35.5	10.2	6.9
1992	13.6	0.0	10.9	11.3	10.4	0.5	0.0	32.7	12.0	8.6
1993	12.8	0.0	10.2	12.6	10.2	0.5	0.0	32.6	12.1	9.0
1994	13.3	0.0	10.4	13.3	10.0	0.5	0.0	30.5	11.8	10.2
1995	14.2	0.0	10.9	12.6	9.9	0.6	0.0	29.6	11.5	10.7
1996	11.1	0.0	10.7	12.0	11.9	0.5	0.0	31.5	10.9	11.4
1997	10.9	0.0	10.2	11.9	13.0	0.5	0.1	31.9	10.5	11.0
1998	11.2	0.0	10.5	12.9	12.6	0.6	0.2	31.3	9.8	10.9
1999	10.1	0.0	9.5	15.3	12.8	0.5	0.2	32.3	9.0	10.3
2000	0.7	0.0	1.0	2.3	1.5	0.0	0.1	85.1	5.4	3.9
2001	0.0	1.9	0.0	2.0	1.5	0.0	0.1	86.7	4.6	3.2

Sources: World Debt Tables 2003 CD-ROM.

Table 2: End-of-year exchange rates of different denominated currencies to the US dollar

Year	Pound sterling	Deutsche mark	Euro	French franc	Japanese yen	Swiss franc	SDR
1970	0.42	3.66		5.55	360.00	4.37	
1971	0.41	3.51		5.54	350.68	4.13	
1972	0.40	3.19		5.04	303.17	3.82	
1973	0.41	2.67		4.45	271.70	3.16	
1974	0.43	2.59		4.81	292.08	2.98	
1975	0.45	2.46		4.29	296.79	2.58	
1976	0.55	2.52		4.80	296.55	2.50	
1977	0.57	2.32		4.91	268.51	2.40	
1978	0.52	2.01		4.51	210.44	1.79	
1979	0.47	1.83		4.25	219.14	1.66	
1980	0.43	1.82		4.23	226.74	1.68	
1981	0.49	2.26		5.43	220.54	1.96	
1982	0.57	2.43		6.57	249.08	2.03	
1983	0.66	2.55		7.62	237.51	2.10	
1984	0.75	2.85		8.74	237.52	2.35	
1985	0.77	2.94		8.99	238.54	2.46	
1986	0.68	2.17		6.93	168.52	1.80	
1987	0.61	1.80		6.01	144.64	1.49	
1988	0.56	1.76		5.96	128.15	1.46	
1989	0.61	1.88		6.38	137.96	1.64	
1990	0.56	1.62		5.45	144.79	1.39	
1991	0.56	1.66		5.64	134.71	1.43	
1992	0.56	1.56		5.29	126.65	1.41	
1993	0.67	1.65		5.66	111.20	1.48	
1994	0.65	1.62		5.55	102.21	1.37	
1995	0.63	1.43		4.99	94.06	1.18	
1996	0.64	1.5		5.12	108.78	1.24	
1997	0.61	1.73		5.84	120.99	1.45	0.74
1998	0.60	1.76		5.90	130.91	1.45	0.71
1999	0.62	1.61		5.48	113.91	1.50	0.73
2000	0.66	1.61		5.47	107.77	1.69	0.77
2001	0.69	1.64	1.11	5.56	121.53	1.69	0.79
2002	0.67	1.67	1.06	5.65	125.39	1.56	0.74

Sources: IMF International Financial Statistics.

Apart from 1998 and 1999, the two estimates indicated similar results for the existence of capital flight or capital reversal for Nigeria in each of the years under study. What is striking is that for most of the years residents engage in capital flight, which confirms findings in earlier studies in the literature. For the 32 years covered in this study, in only 7 years was there capital flight reversal while capital flight occurred in the rest. For both estimates, the incidence of capital flight in nominal terms from Nigeria in the 1970s was generally less than a billion US dollars, except for 1977, when it first hit the billion mark, and was in fact in excess of US$2.2 billion. These results further confirm the trends estimated by Ajayi (1992) and Ojo (1992), who found capital flight to first hit the billion US dollar mark in 1977 (see the Appendix).

Table 3: Data and computation of trade-faking adjusted capital flight estimates

Year	ADJDEBT (US$M)	FDI (US$M)	CAD (US$M)	TRESG (US$M)	FAB (US$M)	CF (WB) (US$M)	CF (MT (US$M)
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
1970	836.7	205	368	97.45	0.56	576.25	576.81
1971	128.13	286	406	206.09	15.5	-197.96	-182.46
1972	132.51	305	342	-52.78	-5.45	148.29	142.83
1973	703.32	373	8	203.29	40.3	865.03	905.33
1974	94.85	257	-4897	5043.72	44.45	205.13	249.58
1975	-197.62	418	-42	-16.87	65.82	279.25	345.07
1976	-381.32	339	357	-405.77	84.13	6.45	90.58
1977	1813.92	440.5	1015.97	-947.61	93.13	2186.06	2279.18
1978	1981.75	210.9	3754.3	-2345.58	-72.92	783.93	711.01
1979	1169.57	309.6	-1670.51	3661.24	148.43	-511.56	-363.14
1980	2688.44	-738.9	-5177.58	4686.9	39.89	2440.22	2480.1
1981	2158.54	542.3	6473.93	-6339.43	-56.85	2566.34	2509.49
1982	352.02	430.6	7281.78	-2282.83	-37.24	-4216.33	-4253.57
1983	5346.27	364.4	4331.8	-622.65	90.37	2001.52	2091.89
1984	-210.63	189.2	-122.63	472.42	51.13	-371.21	-320.09
1985	767.55	485.6	-2603.57	204.91	-94.76	3651.81	3557.06
1986	4694.72	193.2	-210.88	-585.86	109.72	5684.67	5794.38
1987	7906.22	610.6	73.21	83.9	231.29	8359.71	8591
1988	1199.68	378.7	296.45	-514.11	193.39	1796.03	1989.42
1989	-321.18	1884.3	-1089.52	1114.44	30.08	1538.2	1568.28
1990	4376.12	587.9	-4988.25	2098.7	-241.83	7853.56	7611.73
1991	25.98	712.4	-1202.56	570.81	344.3	1370.14	1714.44
1992	-3823.41	896.6	-2267.77	-3467.99	341.84	2808.95	3150.8
1993	1163.2	1345.4	780.39	404.96	115.99	1323.25	1439.24
1994	2807.78	1959.2	2127.93	13.81	-382.52	2625.23	2242.71
1995	2146.54	1079.3	2578.38	57.54	2332.98	589.92	2922.9
1996	-3569.96	1593	-3506.87	2632.3	-591.63	-1102.39	-1694.01
1997	-3995.8	1539.4	-551.55	3506.17	280.94	-5411.01	-5130.07
1998	1585.52	1051.3	4243.53	-481.06	1214.89	-1125.66	89.24
1999	-444.43	1004.8	-505.69	-1650.5	-2742.55	2716.56	-26
2000	2217.53	930.4	-6961.43	4460.58	384.1	5648.78	6032.88
2001	-360.9	1104.4	-4926.15	545.74	665.07	5123.91	5788.98
Average							
1970–1979						434.09	475.48
1980–1989						2345.10	2400.80
1990–2001						1868.44	2011.90
1979–1984						318.16	357.45
1986–1999						2073.37	2161.72
1986–1990						5046.43	5110.96
1990–1999						1164.86	1232.10

Key: ADJDEBT = Adjusted debt for effect of variations in the exchange rate of the external debt denominated countries' currencies to US dollar, which is defined as the debt stock minus currency valuation; FDI = Foreign direct investment; CAD = Current account deficit; TRESG = Total external reserve minus gold; FAB = Changes in foreign asset of banks; CF(WB) = Capital flight estimate, World Bank residual version; CF(MT) = Capital flight estimate, Morgan residual version.

CF(WB) = Net foreign direct investment + Change in adjusted external debt - Current account deficit - Change external reserve minus gold.

CF(MT) = Net foreign direct investment + Change in adjusted external debt + Changes in deposit money banks foreign assets - Current account deficit - Change external reserve minus gold.

* Negative sign implies current account surplus.

The Nigerian hosting of the Black Arts and Culture Festival in 1977 may have been partly responsible for this magnitude of capital flight, as it provided the needed foreign exchange for residents to effect transfer of assets abroad. The capital flight phenomenon became more serious in the 1980s and consistently remained in excess of US$2 billion for most of the period. It reached its peak of over US$8.3 billion in 1987.[5] This was the year after the introduction of the structural adjustment programme (SAP); in 1990 the capital flight flow was more than US$7.6 billion.

As the SAP became more grounded the pace of capital flight appears to have slowed slow down, resulting in repatriation of between US$1.1 billion and US$5.4 billion over the period 1996 to 1998. These results confirm earlier estimates by Ajayi (1992) and Ojo (1992), who applied the same methods. Though the estimated figures in these two studies and the present study are not exactly the same owing to differences in data sources, the pattern of capital flight incidence is similar. For example, negative and positive estimates of capital flight occur in the same years as in Ajayi (1992) and Ojo (1992). Similarly, the pattern of fluctuation (drops and increases) is the same over the years.

On the average, the hitherto light capital flight from Nigeria of the 1970s that hit the roof in the 1980s appears to have significantly subsided in the 1990s. Between 1970 and 1979, an annual average of about US$455 million flew out of Nigeria. In the succeeding decade of 1980 to 1989, the capital flight phenomenon assumed a more serious dimension, as it increased by more than fivefold on the annual average to around US$2.4 billion. Between 1990 and 2001, however, the annual average of capital flight from Nigeria declined by about 20% to between US$1.9 billion and US$2 billion, suggesting a possible reversal trend.

The capital flight episodes in Nigeria also appear to have followed some political and economic trend. During the years 1970–1979, which represents the years of oil boom and military rule, only an average capital of between US$434.09 million and US$475.48 million was recorded. The oil glut of the 1980s not withstanding, the civilian era that followed between 1979 and 1984 appears to have generated greater confidence from private wealth holders who held relatively less of their assets abroad. The capital flight on the average dropped to between US$318.16 million and US$357.45 million over the period. The significant rise in the incidence of capital flight between 1986 and 1999 effectively traced the 14 years of military rule following the military intervention in 1984 and the need for economic reform, which culminated in the adoption of the SAP in mid 1986. Over this period, an annual average capital flight of between US$2.073 billion and US$2.162 billion was effected. Splitting the period into the first five years of the SAP and later years reveals that beyond the averages capital flight from Nigeria was significantly high in the early years of the SAP. Subsequently, as the economic reform measures under the SAP stabilized in the 1990s, the amount of capital flight reduced drastically to between US$1.165 billion and US$1.232 billion per year over the period 1990–1999.

Trade misinvoicing adjusted capital flight estimates

The second modification to our residual capital flight estimates relates to taking into account trade misinvoicing as a means of effecting the export of capital. In order to escape the constraints imposed on capital account transactions, especially on the outflow side, residents resort to misinvoicing of trade volume so as to take advantage of official

foreign exchange allocation for current account transactions. Since movement of funds from developing countries to developed countries is commonly tagged capital flight, investigation of trade misinvoicing is limited to trade discrepancies between Nigeria and developed countries. Partner country data comparisons are usually used for the purpose of investigating the existence as well as estimating the extent of faking of international trade transactions. Given the assumed relative accuracy of trade data from industrialized countries, the discrepancies between industrialized countries' data and Nigeria's is taken as indication of misinvoicing.

The methodology adopted follows Ajayi (1997) and Boyce and Ndikumana (2001). Total trade misinvoicing is calculated as the difference between export discrepancies and import discrepancies:

$$MISINV_t = Xmis_t - Mmis_t \tag{11}$$

where $Xmis_t$ and $Mmis_t$ are, respectively, Nigeria's export misinvoicing and import misinvoicing with the industrialized countries. Nigeria's annual export discrepancies with the industrialized countries are calculated as:

$$Xmis_t = DMN_t - (NXD_t * CFB_t) \tag{12}$$

where *DMN* is industrialized countries' imports from Nigeria as reported by those trading partners; *NXD* is the Nigeria's exports to industrialized countries as reported by Nigeria; and *CFB* is the c.i.f./f.o.b. correction factor, representing the cost of freight and insurance. A positive sign on $Xmis_t$ signifies export under-invoicing, while a negative sign implies export over-invoicing.

Nigeria's annual import discrepancies with the industrial countries are calculated as:

$$Mmis_t = (DXN_t * CFB_t) - NMD_t \tag{13}$$

where *DXN* is the industrialized countries' exports to Nigeria as reported by those trading partners and *NMD* is Nigeria's imports from industrialized countries as reported by Nigeria. A positive sign on $Mmis_t$ implies import under-invoicing, while a negative sign indicates over-invoicing of imports.

The results shown in the last three columns of Table 4 reveal the extent of faking trade to industrial countries. In confirmation of results obtained in Ajayi (1992, 1997) for the period 1970–2001, there was under-invoicing of exports to the cumulative total of US$21 billion and over-invoicing of imports running to a cumulative total of US$2.4 billion. Thus, the total cumulative misinvoicing adjustment for the period is US$18.3 billion. The first four years between 1970 and 1973 were characterized by over-invoicing of exports and under-invoicing of imports, while the next five years (1974–1978) and the last seven years (1995–2001) were characterized by under-invoicing of both exports and imports. Between 1985 and 1991, Nigerian international trade transactions were characterizd by under-invoicing of exports and over-invoicing of imports, while during 1992–1994, there was over-invoicing of both exports and imports. For some years, there

Table 4: Data and computation of trade misinvoicing for Nigeria

Year	DXN	NMD	DMN	NXD	CFB	DXN*CFB	NXD*CFBXMis=DMN-(NXD*CFB)MMis= (DXN*CFB) - MDMISINV=XMis - MMis		
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10
1970	745.00	880.90	1050.00	1039.50	1.09	815.08	1137.28	-87.28	-65.82	-21.46
1971	1035.00	1275.80	1584.00	1550.30	1.10	1136.74	1702.69	-118.69	-139.06	20.38
1972	1090.00	1287.30	1995.00	1925.10	1.10	1195.02	2110.57	-115.57	-92.28	-23.29
1973	1346.00	1596.60	2921.00	2919.80	1.10	1478.79	3207.85	-286.85	-117.81	-169.04
1974	2074.00	2337.80	8937.00	7744.50	1.10	2271.46	8481.84	455.16	-66.34	521.50
1975	4533.00	5338.00	7911.00	6581.00	1.11	5024.37	7294.37	616.63	-313.63	930.27
1976	5534.00	7311.00	9924.00	8051.00	1.11	6135.78	8926.49	997.51	-1175.22	2172.73
1977	7865.00	9710.00	11233.00	8953.00	1.15	9014.69	10261.73	971.27	-695.31	1666.58
1978	8636.00	11166.00	9987.00	8803.00	1.10	9538.44	9722.89	264.11	-1627.56	1891.68
1979	6894.00	7584.00	16841.00	15318.00	1.11	7631.27	16956.17	-115.17	47.27	-162.44
1980	12326.90	13497.00	24019.60	21679.00	1.13	13943.93	24522.82	-503.22	446.93	-950.15
1981	13927.80	15521.40	17463.20	13661.60	1.10	15315.81	15023.08	2440.12	-205.59	2645.71
1982	10123.70	10874.10	14882.70	11671.90	1.08	10931.61	12603.36	2279.34	57.51	2221.83
1983	6174.01	8670.20	11964.10	9571.30	1.07	6615.63	10255.92	1708.18	-2054.57	3762.75
1984	4520.29	4783.20	11684.40	10221.60	1.06	4779.58	10807.93	876.47	-3.62	880.08
1985	4799.15	4984.33	12716.00	11281.30	1.19	5720.70	13447.58	-731.58	736.37	-1467.95
1986	3784.82	2745.53	7777.59	4676.52	1.29	4865.51	6011.82	1765.77	2119.98	-354.20
1987	3562.54	3156.36	7649.22	6660.31	1.17	4181.04	7816.62	-167.40	1024.68	-1192.07
1988	3473.08	3069.97	7264.29	6063.53	1.08	3761.77	6567.55	696.74	691.80	4.94
1989	3334.45	2817.76	10108.10	7365.28	1.13	3780.49	8350.51	1757.59	962.73	794.86
1990	4176.99	3371.70	12986.80	9448.66	1.14	4765.60	10780.13	2206.67	1393.90	812.77
1991	5216.37	4265.15	12581.00	6708.04	1.15	5999.53	7715.15	4865.85	1734.38	3131.48
1992	6212.34	6816.51	11400.80	10365.40	1.15	7158.77	11944.53	-543.73	342.26	-885.99
1993	5031.90	5535.42	10342.50	9392.85	1.10	5544.09	10348.93	-6.43	8.67	-15.09
1994	3382.37	3691.67	10261.80	9330.85	1.14	3863.93	10659.32	-397.52	172.26	-569.79
1995	3509.47	3852.57	10257.40	9346.71	1.03	3630.10	9667.98	589.42	-222.47	811.88
1996	4173.65	4585.45	13080.40	11853.60	1.08	4493.90	12763.15	317.25	-91.55	408.80
1997	4170.67	4584.26	12775.90	11636.60	1.09	4534.58	12651.94	123.96	-49.68	173.64
1998	4307.82	4738.60	8359.00	7599.09	1.09	4677.76	8251.67	107.33	-60.84	168.18
1999	4230.13	4653.14	8399.71	7636.10	1.07	4530.72	8178.71	221.00	-122.42	343.42
2000	4697.03	5167.06	17225.70	15659.80	1.08	5073.87	16916.19	309.51	-93.19	402.70
2001	6167.64	6784.41	15706.20	14278.40	1.08	6667.86	15436.44	269.76	-116.55	386.30
Cumulative Total								20766.21	2425.2	18341.01

Key:: Total export discrepancies = DMN_t – (NXD_t*CFB_t); Total import discrepancies = (DXN_t*CFB_t) – NMD_t ; Total trade misinvoicing = Total export discrepancies – Total import discrepancies; DXN = Industrialized countries' exports to Nigeria as reported by industrialized trading partners; NMD = Nigeria's imports from industrialized countries as reported by Nigeria; DMN = Industrialized countries' imports from Nigeria as reported by industrialized trading partners; NXD = Nigeria's exports to industrialized countries as reported by Nigeria; XMis = Total exports discrepancies; MMis = Total imports discrepancies; MISINV = Total trade misinvoicing; CFB = c.i.f./f.o.b. conversion factor.

are instances where high import under-invoicing and low under-invoicing (over-invoicing) of exports led to substantial capital inflows, which in turn reduces capital flight estimates.

This analysis is based on data from IMF's Direction of Trade (DOT) Statistics (CD-ROM 2003 edition), supplemented with the DOT Yearbook (various issues for early years); the data and the results of the calculation for the period 1970–2001 are reported in Table 4. Over the period between 1970 and 2001 for which trade misinvoicing estimates were computed, only 11 years have a negative sign, which implies that for most of the period capital was taken out of the country through trade misinvoicing.

The magnitude of capital outflows through trade misinvoicing was highest in the range of between US$2.2 billion and US$3.8 billion during the period 1981 to 1983, which represents the civilian era of the second republic. This period marked the beginning of the economic crisis in Nigeria and the resultant introduction of austerity measures in the wake of foreign exchange rationing. This period was also marked by heavy importation of rice by government, an activity that was characterized by corrupt practices. Another period that witnessed heavy outflow of capital in excess of billions of US dollars through trade misinvoicing was 1976–1978, which are the years preceding the assumption of office by the civilian government in Nigeria. Trade misinvoicing, as a means of transferring assets abroad from Nigeria, appears to have slowed down in the last decade (1992–2001), as the amount generally declined to less than US$0.4 billion.

Capital flight estimates with adjustment for trade-faking are derived by adding total trade misinvoicing to the initial estimates of capital flight from equations 10a and 10b, i.e.:

$$TACF(WB)_t = CF(WB)_t + MISINV_t. \quad (14a)$$

$$TACF(MT)_t = CF(MT)_t + MISINV_t. \quad (14b)$$

where *TACF(WB)* and *TACF(MT)* are the trade misinvoicing adjusted capital flight estimates and *MISINV* is total trade misinvoicing. A positive value of *MISINV* implies an outflow of capital, while negative means an inflow of capital.

Adjusting our capital flight estimates for these trade misinvoicing figures we obtained the results reported columns 4 and 5 in Table 5. For most of the period, the capital flight estimate has a positive sign, which indicates that residents consistently took capital out of Nigeria. For the two estimation methods, the results indicate capital flight reversal for only 6 of the 32 years covered. These years are 1971, which happens to be the first year after Nigeria's civil war; 1979, the year the country returned to civil rule; 1982, three years into the second civil rule in the country; and 1996 to 1998. The peak of capital flight reversal of around US$5 billion to Nigeria occurred in 1997. For the rest of the years of the three decades covered, there were capital flights from the country ranging from US$120 million to US$8.7 billion in 1990. Basically, no distinct pattern is reflected in terms of a specific observable trend of the estimates; rather, the estimates are characterized by fluctuation similar to what obtains in other studies in the literature (e.g., Ajayi, 1992, 1997).

On the average, more than US$2.2 billion worth of capital was exported from Nigeria yearly, while a total of between US$68 billion and US$71 billion exited the economy between 1970 and 2001. Huge capital flights appear to concentrate in most of the years

Table 5: Data and computation of trade-faking adjusted capital flight estimates

Year	CF (WB) (US$M)	CF (MT) (US$M)	MISINV (US$M)	TACF (WB)= CF(WB)+ MISINV (US$M)	TACF (MT) = CF(MT)+ MISINV (US$M)	US CPI (%) (US$M)	RL CF (WB) (US$M)	RL CF (MT) (US$M)	RL TACF (WB) (US$M)	RL TACF (MT) (US$M)
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10
1970	576.25	576.81	-21.46	554.79	555.35	25.48	2261.58	2263.78	2177.35	2179.55
1971	-197.96	-182.46	20.38	-177.58	-162.08	26.57	-745.05	-686.71	-668.36	-610.02
1972	148.29	142.83	-23.29	125.00	119.54	27.44	540.42	520.52	455.53	435.64
1973	865.03	905.33	-169.04	695.99	736.29	29.15	2967.51	3105.76	2387.61	2525.86
1974	205.13	249.58	521.5	726.63	771.08	32.37	633.70	771.02	2244.76	2382.08
1975	279.25	345.07	930.27	1209.52	1275.34	35.32	790.63	976.98	3424.45	3610.80
1976	6.45	90.58	2172.73	2179.18	2263.31	37.35	17.27	242.52	5834.50	6059.74
1977	2186.06	2279.18	1666.58	3852.64	3945.76	39.77	5496.76	5730.90	9687.30	9921.46
1978	783.93	711.01	1891.68	2675.61	2602.69	42.81	1831.18	1660.85	6249.97	6079.63
1979	-511.56	-363.14	-162.44	-674.01	-525.58	47.64	-1073.80	-762.26	-1414.80	-1103.24
1980	2440.22	2480.1	-950.15	1490.07	1529.95	54.07	4513.08	4586.83	2755.81	2829.57
1981	2566.34	2509.49	2645.71	5212.04	5155.20	59.65	4302.33	4207.02	8737.71	8642.41
1982	-4216.33	-4253.57	2221.83	-1994.50	-2031.74	63.33	-6657.71	-6716.52	-3149.38	-3208.18
1983	2001.52	2091.89	3762.75	5764.27	5854.64	65.36	3062.30	3200.57	8819.27	8957.53
1984	-371.21	-320.09	880.08	508.87	559.99	68.18	-544.46	-469.48	746.36	821.34
1985	3651.81	3557.06	-1467.95	2183.87	2089.11	70.61	5171.80	5037.62	3092.86	2958.67
1986	5684.67	5794.38	-354.2	5330.46	5440.18	71.92	7904.16	8056.70	7411.66	7564.20
1987	8359.71	8591	-1192.07	7167.64	7398.93	74.61	11204.54	11514.54	9606.81	9916.80
1988	1796.03	1989.42	4.94	1800.97	1994.36	77.61	2314.17	2563.36	2320.54	2569.72
1989	1538.2	1568.28	794.86	2333.06	2363.14	81.35	1890.84	1927.82	2867.93	2904.91
1990	7853.56	7611.73	812.77	8666.33	8424.50	85.74	9159.74	8877.69	10107.69	9825.64
1991	1370.14	1714.44	3131.48	4501.61	4845.92	89.37	1533.11	1918.36	5037.05	5422.31
1992	2808.95	3150.80	-885.99	1922.96	2264.81	92.08	3050.55	3421.81	2088.36	2459.61
1993	1323.25	1439.24	-15.09	1308.16	1424.15	94.80	1395.83	1518.19	1379.91	1502.26
1994	2625.23	2242.71	-569.79	2055.45	1672.92	97.27	2698.91	2305.65	2113.13	1719.87
1995	589.92	2922.9	811.88	1401.81	3734.78	100.00	589.92	2922.90	1401.81	3734.78
1996	-1102.39	-1694.01	408.8	-693.59	-1285.21	102.93	-1071.01	-1645.79	-673.85	-1248.63
1997	-5411.01	-5130.07	173.64	-5237.37	-4956.43	105.34	-5136.71	-4870.01	-4971.87	-4705.17
1998	-1125.66	89.24	168.18	-957.48	257.42	106.97	-1052.31	83.43	-895.09	240.64
1999	2716.56	-26	343.42	3059.98	317.42	109.31	2485.19	-23.79	2799.36	290.39
2000	5648.78	6032.88	402.7	6051.48	6435.58	113.00	4998.92	5338.83	5355.29	5695.20
2001	5123.91	5788.98	386.3	5510.21	6175.28	116.20	4409.56	4981.91	4742.01	5314.36
Average										
1970–1979							1272.02	1382.34	3037.83	3148.15
1980–1989							3316.11	3390.85	4320.96	4395.70
1990–2001							1921.81	2069.10	2373.65	2520.94

Key: ADJDEBT = Adjusted debt for effect of variations in the exchange rate of the external debt denominated countries' currencies to US dollar, which is defined as the debt stock minus currency valuation; FDI = Foreign direct investment; CAD = Current account deficit; TRESG = Total external reserve minus gold; FAB = Changes in foreign asset of banks; CF(WB) = Capital flight estimate, World Bank residual version; CF(MT) = Capital flight estimate, Morgan residual version; MSINV = Total trade misinvoicing; TACF = Trade-faking adjusted capital flight estimates; US CPI = United States consumer price index; RLCF = Real unadjusted capital flight estimates, deflated by US consumer price index; RLTACF = Real trade-faking adjusted capital flight estimates, deflated by US consumer price index.
Sources: Computed by the author.

in the 1980s. The annual average capital flight estimates of US$1.1 billion for the period 1970–1979 significantly rose by 150% to US$3.0 billion in the decade of the 1980s (1980–1989). However, there appears to have been some level of capital reversal into the country as the capital flight estimates dropped by about 23% in the decade of 1990–2001 to between US$2.3 billion and US$2.4 billion.

Capital flight estimates adjusted for inflation

The third modification to our basic residual estimates is the deflation of the obtained capital flight estimates to correct for inflation so as to get real capital estimates. Using the US consumer price index to deflate the estimates from the World Bank and Morgan Trust residual methods and trade adjusted estimates, we obtain real capital flight estimates for Nigeria. These are reported in the last four columns of Table 5. This is basically preparatory to portfolio expression of the capital flight estimates, as it is summed up with private stock of capital to determine the proportion of capital flight in total real private wealth. The relevant study in the literature here is Boyce and Ndikumana (2001), who not only adjusted for trade misinvoicing in their capital flight estimates, but also deflated with US producer price index (PPI) to get real estimates. While our capital flight estimate figures are not exactly the same as theirs because of difference in data sources, the trend pattern appears to be the same, as the noticed fluctuations (drops and increases) as well as negative and positive estimates are exact for most years (see Appendix).

In 1996 real terms, the magnitude of capital flight estimates is generally in excess of US$1 billion. The magnitude steadily increased from about US$0.44 billion in 1972 to more than US$9.6 billion in 1978. Apart from 1971 and 1979, when there were capital flight reversals, the magnitude of real capital flight from Nigeria was in excess of US$2 billion, while it ranged between US$5.8 billion and US$9.9 billion in the years 1976 to 1978. On the average, more than US$3 billion real capital was annually exported from Nigeria over the period 1970–1979. This was followed by a series of fluctuations that cumulated into a real capital flight peak of US$9.9 billion over the period 1980–1989. The pace of capital flight became more intense in the 1980s as more than US$7 billion worth of real capital was exported in 1981, 1983, 1986 and 1987, while real capital flight was in excess of US$2.8 billion in most of the other years. In the 1980s an annual average of more than US$4.3 billion real capital flight occurred in Nigeria. However, capital flight from Nigeria appears to have slowed down in the 1990s. Though the capital flight in real terms reached its peak of US$10.1 billion in 1990, it was followed by gradual decline to US$1.4 billion in 1995, and capital reversal in the years 1996–1998. The annual average of real capital flight from Nigeria dropped significantly to about US$2.4 billion, which is less than what obtained in the 1970s. Between 1996 and 1998 there were real capital flight reversals, with the highest of about US$5 billion in 1997.

We notice a similar pattern in the estimate of capital flight for Nigeria from the two versions of the residual method for the unadjusted and the trade-faking adjusted estimates. In both instances, for unadjusted estimates, the capital flight reached its zenith in 1987, while the troughs occurred in 1982 and 1997 (Figure 1a and 1b). Similarly, for the trade-faking adjusted estimates, the peaks and the trough occurred in those same years (Figure 2a and 2b).

Figure 1: Real capital flight

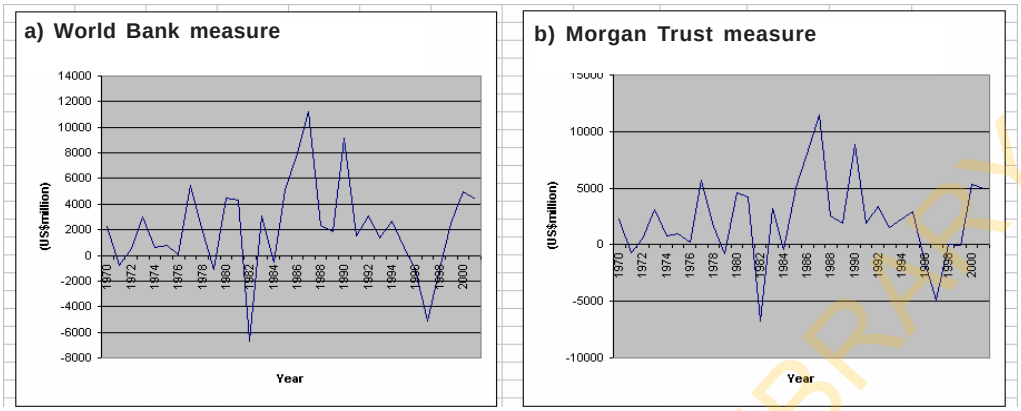
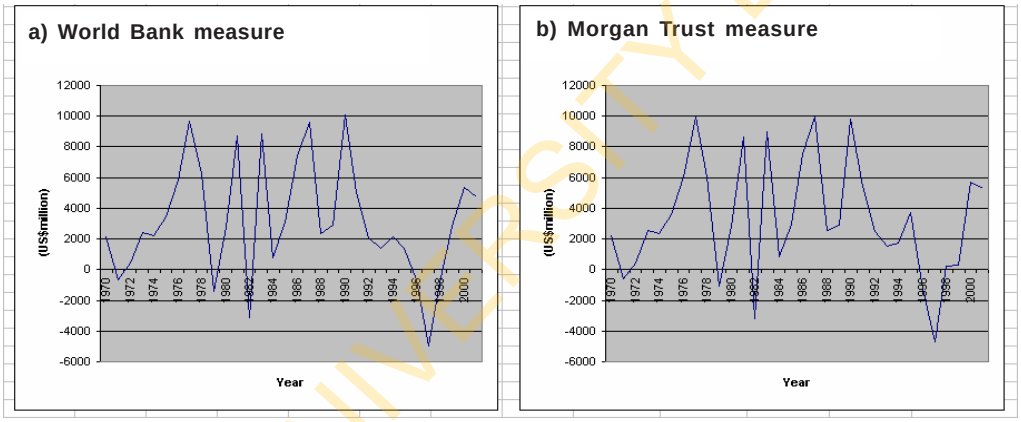


Figure 2: Real trade adjusted capital flight



Stock accumulation of real capital flight estimates

The real capital flight estimates from the preceding section are basically flows. A stock estimate is required in the portfolio choice framework adopted in this study. The flow figures are thus accumulated into stock on the basis of the methodology presented in Collier et al. (2004). The accumulated stock of capital flight (ASCF) at time *t* is computed as:

$$ASCF_t = ASCF_{t-1}\ (1+r^f)\ + CF_t, \qquad (15)$$

where CF_t and r^f are the capital flight estimates at time *t* and foreign rate of return. Though CF_t may take negative values for some years, both $ASCF_t$ and $ASCF_{t-1}$ are not allowed to be negative.

All stocks of capital flight prior to the starting period of observation are treated as zero. The interest rate on treasury bills in the United States is used for the foreign rate of return. The cumulative stock series is presented in Table 6. As should be expected, the cumulative estimates progressively increased over the years. Starting with about US$2 billion in 1970, the stock of capital flight increased to between US$6 billion and US$7.5 billion in 1975. By the turn of the decade of the 1970s it had grown to between US$16.6 billion and US$37 billion in 1979. The rate of increase in the 1980s appears to step up, as the stock of capital reached between US$76 billion and US$141 billion in 1989, representing between 381% and 460% increase. Although the increasing trend in the stock of capital flight estimates continued in the 1990s, the rate of increase however slowed down as it stood at between US$172 billion and US$302 billion. These figures represent a percentage increase of between 215% and 225%.

Table 6: Accumulated stock of capital flight estimates ($US million)

						$ASCF_T = ASCF_{T-1}.(1+R^F) + CF_T$,			
Year	RLCF (WB)	RLCF (MT)	RLTACF (WB)	RLTACF (MT)		ASCF (WB) ASTACF (MT)	ASTACF (MT)	ASCF (WB)	ASTACF (MT)
	(US$M)	(US$M)	(US$M)	(US$M)	$(1+R^F)$	(US$M)	(US$M)	(US$M)	(US$M)
1971	2261.58	2263.78	2177.35	2179.55	1.0434	2261.6	2263.8	2177.3	2179.5
1972	-745.05	-686.71	-668.36	-610.02	1.0407	1662.2	1722.8	1649.2	1709.9
1973	540.42	520.52	455.53	435.64	1.0703	2274.7	2318.1	2176.3	2219.7
1974	2967.51	3105.76	2387.61	2525.86	1.0787	5334.8	5518.2	4652.5	4835.9
1975	633.70	771.02	2244.76	2382.08	1.0582	6343.5	6677.2	7224.3	7558.0
1976	790.63	976.98	3424.45	3610.80	1.0499	7633.4	8179.7	11217.3	11763.6
1977	17.27	242.52	5834.50	6059.74	1.0527	8094.9	8898.3	17704.7	18508.0
1978	5496.76	5730.90	9687.30	9921.46	1.0722	13995.6	15073.2	28275.4	29353.0
1979	1831.18	1660.85	6249.97	6079.63	1.1004	16564.4	17528.4	36015.5	36979.5
1980	-1073.80	-762.26	-1414.80	-1103.24	1.1162	16686.5	18031.7	37201.0	38546.2
1981	4513.08	4586.83	2755.81	2829.57	1.1408	22874.9	24428.9	43691.8	45245.8
1982	4302.33	4207.02	8737.71	8642.41	1.1073	29835.3	31474.6	57506.5	59145.8
1983	-6657.71	-6716.52	-3149.38	-3208.18	1.0862	27378.4	29189.7	62454.1	64265.3
1984	3062.30	3200.57	8819.27	8957.53	1.0939	33378.4	35522.3	77974.7	80118.5
1985	-544.46	-469.48	746.36	821.34	1.0749	35711.2	38114.8	85442.5	87846.1
1986	5171.80	5037.62	3092.86	2958.67	1.0597	44236.3	46731.4	96558.4	99053.5
1987	7904.16	8056.70	7411.66	7564.20	1.0583	55453.7	58288.3	111202.2	114036.8
1988	11204.54	11514.54	9606.81	9916.80	1.0667	69968.8	73282.6	127447.8	130761.6
1989	2314.17	2563.36	2320.54	2569.72	1.0812	76362.2	80118.4	137198.6	140954.8
1990	1890.84	1927.82	2867.93	2904.91	1.0751	83346.4	87390.1	149217.7	153261.3
1991	9159.74	8877.69	10107.69	9825.64	1.0541	99273.9	103363.9	171441.8	175531.8
1992	1533.11	1918.36	5037.05	5422.31	1.0346	108262.4	113044.8	189354.1	194136.6
1993	3050.55	3421.81	2088.36	2459.61	1.0302	117170.0	122582.4	201686.6	207099.0
1994	1395.83	1518.19	1379.91	1502.26	1.0427	122619.9	128341.9	210044.8	215766.8
1995	2698.91	2305.65	2113.13	1719.87	1.0551	129022.0	134523.5	218501.3	224002.9
1996	589.92	2922.90	1401.81	3734.78	1.0502	135121.1	143190.5	229233.1	237302.6
1997	-1071.01	-1645.79	-673.85	-1248.63	1.0507	141495.3	149434.6	241190.0	249129.3
1998	-5136.71	-4870.01	-4971.87	-4705.17	1.0482	143461.6	152066.2	248325.9	256930.4
1999	-1052.31	83.43	-895.09	240.64	1.0466	149682.8	159859.3	260020.9	270197.5
2000	2485.19	-23.79	2799.36	290.39	1.0584	159382.7	167540.8	275353.3	283511.4
2001	4998.92	5338.83	5355.29	5695.20	1.0345	171808.9	180687.0	293540.1	302418.2

Sources: Computed by the author.

Stock of private real wealth

The stock of private real wealth is measured as the sum of real flight capital and the private real capital stock. The stock of private real capital stated in the first four columns of Table 7 is calculated as follows: We measure the annual private real capital stock as a component of the annual aggregate domestic (public and private) capital stock for the entire country, derived from the past annual investment flows. In the computation of private real capital stock, we utilized data on the share of private investment from African Development Indicators, and data on investment share of real GDP and ratio of Nigerian GDP to United States GDP from Penn World Table 6.1.

Using the perpetual inventory method, the aggregate domestic capital stock for period *t* is measured as:

$$K_{t+1} = \sum_{k=0} (1-\eta)^t I_{t-k} + (1-\eta)^t K_0 \tag{16}$$

where K_0 is the initial capital stock given as $K_0 = kY_0$, where k is the constant capital-output ratio; η is the average depreciation rate, and I is gross investment. The initial capital is given as:

$$K_0 = kY_0 \tag{17}$$

where Y_0 is the initial output. With the assumption of a steady-state for the economy, we have a constant capital-output ratio $k=K/Y$, as the same rate of growth (λ_t) applies to both output (Y) and capital (K). That is, k is the steady-state capital output ratio computed as $k=i/(\lambda+\eta)$, where i is the investment rate.

Given non-availability of data on Nigeria's capital consumption, we assume 7% per annum depreciation of the capital stock, according to King and Levine (1994). With the Nigerian economy growing at an average rate of 1.8% over the period 1960–2000, and world's growth rate of 4%, the steady-state growth rate is calculated with 1:3 weighted average of Nigeria's and world's growth rates, respectively. Using PWT 6.1 data, the average investment-output ratio over the period 1960–2000 is calculated to be 0.089. Similarly, with output data from PWT 6.1 over 1960–69, the initial capital stock is calculated based on the initial output estimate.

The sum of the accumulated stock of capital flight estimates and the stock of private real capital gives the stock of private real wealth. The portfolio variable is subsequently expressed as the ratio of accumulated stock of flight capital to stock of private real wealth. The procedure and portfolio variable series are presented in Table 7. The trends of the portfolio series from all the different methods are similar, with a progressively increasing inclination, although characterized by a number of fluctuations.

The average share of stock of real private wealth held abroad over the period 1970–2001 is between 33.5% and 45.2%. This ratio compares favourably with the result of Collier et al. (2004) for a sample of African countries, including Nigeria, which was found to be around 38%.

Table 7: Accumulated stock of capital flight and portfolio variables

Year	Investment (US$M)	ARCS (US$M)	Priv. invt. ratio (US$M)	PRCS (US$M)	ASCF (WB) (US$M)	ASCF (MT) (US$M)	ASTACF (WB) (US$M)	ASTACF (MT) (US$M)	PTRW1= PRCS+ ASCF(WB) (US$M)	PTRW2= PRCS+ ASCF(MT) (US$M)	PTRW3= PRCS+ ASTACF (WB) (US$M)	PTRW4= PRCS+ ASTACF (MT) (US$M)	CFDWB =ASCF (WB) /PRW1 (US$M)	CFDMT=ASCF (MT) /PRW2 (US$M)	CFAWB= ASTACF (WB) /PTRW3 (US$M)	CFAMT= ASTACF (MT) /PTRW4 (US$M)
	Col.1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14	Col. 15	Col.16
1970	9847.23	140664.2	0.4	55667.1	2261.6	2263.8	2177.3	2179.5	57928.7	57930.9	57844.4	57928.7	3.90	3.91	3.76	3.77
1971	13307.22	144124.9	0.34	49608.21	1662.2	1722.8	1649.2	1709.9	51270.4	51331.1	51257.4	51318.1	3.24	3.36	3.22	3.33
1972	12895.25	146931.4	0.49	71902.6	2274.7	2318.1	2176.3	2219.7	74177.3	74220.7	74078.9	74122.3	3.07	3.12	2.94	2.99
1973	15155.04	151801.3	0.65	98941.88	5334.8	5518.2	4652.5	4835.9	104276.7	104460.1	103594.4	103777.8	5.12	5.28	4.49	4.66
1974	18374.04	159549.2	0.41	65696.73	6343.5	6677.2	7224.3	7558.0	72040.3	72373.9	72921.1	73254.7	8.81	9.23	9.91	10.32
1975	29808.9	178189.7	0.28	49497.15	7633.4	8179.7	11217.3	11763.6	57130.5	57676.8	60714.5	61260.7	13.36	14.18	18.48	19.2
1976	41151.98	206868.4	0.23	46775.97	8094.9	8898.3	17704.7	18508.0	54870.9	55674.2	64480.6	65284.0	14.75	15.98	27.46	28.35
1977	51607.63	243995.2	0.35	85355.21	13995.6	15073.2	28275.4	29353.0	99350.8	100428.4	113630.7	114708.2	14.09	15.01	24.88	25.59
1978	36925.79	263841.3	0.39	103242.3	16564.4	17528.4	36015.5	36979.5	119806.6	120770.7	139257.8	140221.8	13.83	14.51	25.86	26.37
1979	26272.35	271644.8	0.36	98332.95	16686.5	18031.7	37201.0	38546.2	115019.5	116364.6	135534.0	136879.2	14.51	15.50	27.45	28.16
1980	35951.01	288580.7	0.31	89291.77	22874.9	24428.9	43691.8	45245.8	112166.7	113720.7	132983.6	134537.6	20.39	21.48	32.86	33.63
1981	40439.37	308819.4	0.32	99524.73	29835.3	31474.6	57506.5	59145.8	129360.0	130999.3	157031.3	158670.5	23.06	24.03	36.62	37.28
1982	28004.9	315206.9	0.36	114810.5	27378.4	29189.7	62454.1	64265.3	142188.9	144000.1	177264.6	179075.8	19.25	20.27	35.23	35.89
1983	21157.13	314299.6	0.36	112249.9	33378.4	35522.3	77974.7	80118.5	145628.3	147772.1	190224.5	192368.4	22.92	24.04	40.99	41.65
1984	12752.09	305050.7	0.4	122020.3	35711.2	38114.8	85442.5	87846.1	157731.4	160135.1	207462.7	209866.4	22.64	23.80	41.18	41.86
1985	10728.83	294426	0.34	101071.6	44236.3	46731.4	96558.4	99053.5	145307.9	147803.0	197630.0	200125.1	30.44	31.62	48.86	49.5
1986	6824.37	280640.5	0.33	91577.43	55453.7	58288.3	111202.2	114036.8	147031.1	149865.7	202779.7	205614.3	37.72	38.89	54.84	55.46
1987	8207.71	269203.4	0.38	102553.7	69968.8	73282.6	127447.8	130761.6	172522.5	175836.3	230001.5	233315.3	40.56	41.68	55.41	56.05
1988	8599.94	258959.1	0.38	99599.65	76362.2	80118.4	137198.6	140954.8	175961.9	179718.0	236798.2	240554.4	43.40	44.58	57.94	58.6
1989	10421.8	251253.8	0.33	83059.1	83346.4	87390.1	149217.7	153261.3	166405.5	170449.2	232276.7	236320.4	50.09	51.27	64.24	64.85
1990	11015.49	244681.5	0.26	63684.22	99273.9	103363.9	171441.8	175531.8	162958.1	167048.1	235126.0	239216.0	60.92	61.88	72.91	73.38
1991	15071.66	242625.5	0.51	124423.3	108262.4	113044.8	189354.1	194136.6	232685.7	237468.2	313777.5	318559.9	46.53	47.60	60.35	60.94
1992	17428.22	243069.9	0.38	92971.43	117170.0	122582.4	201686.6	207099.0	210141.4	215553.8	294658.0	300070.4	55.76	56.87	68.45	69.02
1993	20686.39	246741.4	0.54	132942.6	122619.9	128341.9	210044.8	215766.8	255562.5	261284.5	342987.4	348709.4	47.98	49.12	61.24	61.88
1994	21103.55	250573.1	0.72	204549.4	129022.0	134523.5	218501.3	224002.9	333571.4	339072.9	423050.8	428552.3	38.68	39.67	51.65	52.27
1995	18602.19	251635.1	0.68	170314	135121.1	143190.5	229233.1	237302.6	305435.1	313504.6	399547.2	407616.6	44.24	45.67	57.37	58.22
1996	24348.08	258368.8	0.63	163083.8	141495.3	149434.6	241190.0	249129.3	304579.1	312518.4	404273.9	412213.1	46.46	47.82	59.66	60.44
1997	22570.38	262853.3	0.59	155597.1	143461.6	152066.2	248325.9	256930.4	299058.7	307663.2	403923.0	412527.5	47.97	49.43	61.48	62.28
1998	19914.85	264368.4	0.41	29893.25	149682.8	159859.3	260020.9	270197.5	179576.1	189752.6	289914.2	300090.7	83.35	84.25	89.69	90.04
1999	30725.01	276587.7	0.26	73147.15	159382.7	167540.8	275353.3	283511.4	232529.9	240687.9	348500.5	356658.5	68.54	69.61	79.01	79.49
2000	53126.69	310353.2	0.29	89657.59	171808.9	180687.0	293540.1	302418.2	261466.5	270344.6	383197.7	392075.8	65.71	66.84	76.6	77.13
2001	30667.76	319296.2	0.38	120667.5	186252.1	196221.0	315424.8	325393.8	306919.6	316888.6	436092.3	446061.3	60.68	61.92	72.33	72.95
Averages									33.50	34.45	44.60	45.17				

Key: ARCS = Aggregate real capital stock; PRCS = Private real capital stock; ASCF(WB) = Accumulated stock of capital flight based on World Bank residual method; ASCF(MT) = Accumulated stock of capital flight based on Morgan Trust residual method; ASTACF(WB) = Accumulated stock of trade-faking adjusted capital flight based on World Bank residual method; ASTACF(MT) = Accumulated stock of trade-faking adjusted capital flight based on Morgan Trust residual method; PTRW = Private total real wealth.

Causes of capital flight

Quite a number of factors have been identified in the literature as accounting for citizens' decisions to reallocate their wealth abroad. Among other reasons, political factors, macroeconomic mismanagement and policy distortions serve as incentives for residents to take their assets out of the country (Onwioduokit, 2001). For Nigeria specifically, Ajayi (1992) and Ojo (1992) identified factors such as level of foreign exchange reserves, changes in exchange rates, growth rate of the economy, real interest rate differentials, changes in inflation rates, financial repression, fiscal balance and external loan disbursement. Cuddington (1987) identified disbursement of new loans to developing countries as an additional cause. Other causes can be exchange rate misalignment, financial sector constraints and/or repression, fiscal deficits, and external incentives.

At the general level, capital flights are caused by differences in perceived risk adjusted returns (or costs) in source and haven countries (Smit and Mocke, 1991). Capital moves from one country to another looking for profit and the possible minimum financial and political risk (Pinheiro, 1997). Capital flight movement can be approached from the standpoint of a standard portfolio balance or portfolio adjustment behaviour, in which a wealth holder holds a range of domestic and foreign assets. Within this framework, the investor's asset holdings are augmented as savings grow, while the assets demand decision is influenced by the relative rates of return on domestic and foreign assets and the risk element. Moved by fear and suspicion, investors – including residents – lose confidence as a consequence of negative economic performance or political instability, which increases the perception of risk that stimulates them to put their money abroad (Pinheiro, 1997). While the risk of expropriation, debt repudiation or exchange depreciation could give rise to capital loss, the risk of fresh market distortions (such as capital control), taxation and financial repression could lead to capital impairment. Thus, the determinants of capital flight require exploring beyond portfolio balance considerations to allow for inclusion of peculiar domestic factors that could be propelling capital flight in Nigeria.

The macroeconomic climate has been identified as the single most important factor in provoking capital flight. The domestic macroeconomic climate reflects such factors as government policies and their consistency, inflation rate, profitability of investment, exchange rate misalignment, and general level of security in a country. Specific causes of capital flight identified by other authors in the literature include high domestic inflation rates, foreign–domestic interest rate differentials, high fiscal deficit, low level of external reserves, financial repression, as well as low rates of GDP growth.

Political instability and corrupt practices constitute the non-economic causes of capital flight in developing countries, including Nigeria. An unstable political environment characterized by frequent or irregular termination of regimes has been hypothesized to subvert economic systems governing resource allocation as well as the expected incentives. It has been established that wealth holders are significantly influenced by the existing political climate in a country in deciding about the proportion of their wealth to hold in the country. A standard measure of political risk is not readily available for most countries, however. Instead, proxies, such as what a particular regime portends for stability and a conducive atmosphere for investment to thrive are usually used.

Econometric modelling of the determinants of portfolio decision of private wealth holders

Households hold wealth portfolios in form of both domestic and foreign assets. The proportion of the portfolio held abroad is influenced by the returns and riskiness of domestic assets relative to foreign assets. The literature points to the theoretical relationship between the growth of the domestic real GDP and capital flight. High growth of real GDP may be seen as an indication of enhanced investment opportunities, thus a negative relationship is expected between economic growth and capital flight.

Since private wealth holders are concerned about the real returns on their investments, the rate of return differential between foreign and domestic asset is considered an important determinant of portfolio decisions. We used the variable *RIRD* to test this hypothesis, with the expected coefficient being positive since higher real interest rate differential encourages Nigerians to hold their wealth in foreign bank accounts. The higher the differential, the higher the proportion of portfolio held abroad.

As the literature suggests, high domestic inflation rates have the tendency of reducing the real value of domestic assets. Residents are induced to divert their wealth abroad to avoid possible inflation tax. More so, an expected outcome of current high inflation may be depreciation of the currency rate in the future. Changes in inflation rate are expected to have a positive effect on capital flight.

The influence of debt-increasing capital flows on capital flight has also been considered in the literature, with focus on the government and government guaranteed debt. The prospect of future repayment is expected to translate into future tax burden on wealth holders; in a bid to escape this inflation tax residents are motivated to hold their wealth abroad. Also, shifting of funds abroad can be stimulated if increasing debt forces the government to stimulate exports by real devaluation of the currency.

The influence of exchange rate misalignment on capital flight is investigated in this study by considering parallel market exchange rate premiums. In the literature, currency over-valuation indicative of the premium is an important determinant of capital flight. Since future depreciation is expected in situation of over-valued currency, residents choose to hold their wealth abroad in order to avoid capital losses.

Although the effect of accumulation of domestic debt by the government on capital flight has not received much consideration in the literature, the possible investment alternative that it constitutes for residents, all else being equal, can be expected to discourage capital flight. In recent years, not only have developing countries accumulated external debt, but the magnitude of domestic debt has also increased. In an environment where investment opportunities are scarce, investment in government bonds serves as certain alternative form in which assets can be profitably held. Thus, an increase in domestic debt is expected to discourage capital flight.

Fiscal deficit is posited to have the effect of inducing capital flight. The fiscal deficit/GDP ratio is an indication of possible fiscal crisis. Citizens often consider it as a pointer to future financial repression in the financing of the domestic economy and attempt to avoid the fallout by reducing the proportion of domestically held assets. Thus, a higher deficit (or surplus) ratio to GDP is expected to result in more capital flight.

The political climate is another indication of the degree of risk involved in holding wealth domestically. A politically unstable environment portends a devastating effect on

economic activities and policy consistency. Policy inconstancies often hinder adequate investment plans. It is expected that the more unstable an economy is politically, the greater the proportion of private wealth held abroad. Owing to lack of consistent data that indicate the level of political risk in Nigeria, we proxy political risk with the advent of different types of rules in the country, democratically-elected governments vis-à-vis military rule.

Given these theoretical underpinnings, the variables that are expected to affect portfolio decisions of private wealth holders can take the following general model form:

$$\sum_{0}^{1}\alpha_{5t}DDEBT_{t-k}+\sum_{0}^{1}\alpha_{6t}DEF_{t-k}+\sum_{0}^{1}\alpha_{7t}CINF_{t-k}+\sum_{0}^{1}\alpha_{8k}POL \qquad (18)$$

where CF_i stands for different portfolio variables based on different versions of capital flight estimates.

Each of the capital flight estimates used was converted to real by deflating it with the US consumer price index. The list and definitions of the variables and expected signs are as follows:

- CFDWB = Unadjusted portfolio variable of capital flight estimate adjusted for trade-faking, "World Bank Residual Method" (Table 5, column 13).
- CFDMT = Unadjusted portfolio variable of capital flight estimate adjusted for trade-faking, "Morgan Trust Residual Method" (Table 5, column 14).
- CFAWB = Adjusted portfolio variable of capital flight estimate adjusted for trade-faking, "World Bank Residual Method" (Table 5, column 15).
- CFAMT = Adjusted portfolio variable of capital flight estimate adjusted for trade-faking, "Morgan Trust Residual Method" (Table 5, column 16).
- GGDP = Percentage growth rate of gross domestic product (Table 7, column 1) (-/+).
- DEF = Federal government overall budget surplus (-)/Deficit (+) as percentage of GDP (Table 7, column 8) (+).
- RIRD = Real interest rate differential defined as US real interest rate minus Nigeria real interest rate (Table 7, column 3) (+).
- PMP = Parallel market exchange rate premium (+).
- CINF = Change in inflation rate defined as the difference between the log of this year's inflation rate and the log of last year's inflation rate (Table 7, column 9) (+).
- GLTD = Stock of government and government guarantee external long-term debt as percentage of GDP (Table 7, column 5) (+).
- DDEBT = Stock of domestic debt as percentage of GDP (Table 7, column 6) (-).
- POL = Political stability measure defined as having value 1 during military rule and zero otherwise (civilian rule) (Table 7, column 7) (-).

$$CF_{it}=\alpha_0 CF_{it-1}+\sum_{k=0}^{1}\alpha_{2k}GGDP_{t-k}+\sum_{0}^{1}\alpha_{3k}RIRD_{t-k}+\sum_{0}^{1}\alpha_{4k}PMP_{t-k}+\sum_{0}^{1}\alpha_{4k}GLTD_{t-k}+$$

The data set with respect to each of the variables used for the regression analysis is presented in Table 8.

Table 8: Regression explanatory variables series

Year	GGDP	RIRD	PMP	GLTD	DDEBT	POL	DEF	CINF
	Col. 1	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9
1970	25.01	31.97	-14.03	2.05	8.44	0.00	8.70	0.13
1971	14.24	-5.47	-15.94	1.72	7.92	1.00	-2.60	0.07
1972	3.36	-2.94	-12.12	2.39	8.95	1.00	0.80	-0.67
1973	5.39	0.74	25.76	2.26	8.63	1.00	-1.50	0.19
1974	11.16	27.30	39.68	1.64	6.44	1.00	-9.80	0.37
1975	-5.23	12.60	43.55	1.53	7.30	1.00	2.00	0.43
1976	9.04	8.01	41.27	1.31	9.19	1.00	4.00	-0.14
1977	6.02	4.63	56.92	1.08	10.15	1.00	2.40	-0.24
1978	-5.76	8.10	-29.19	3.47	16.59	1.00	7.80	0.20
1979	6.76	7.28	76.67	3.76	16.82	1.00	-3.40	-0.27
1980	4.20	9.11	63.64	3.71	15.75	0.00	-3.90	-0.07
1981	-13.13	15.00	52.46	5.96	22.55	0.00	7.70	0.32
1982	-0.23	1.41	70.15	4.99	28.58	0.00	11.80	-0.43
1983	-5.29	11.88	152.78	18.51	38.89	0.00	5.90	0.48
1984	-4.82	13.76	322.08	22.85	40.36	1.00	4.20	0.23
1985	9.70	0.98	325.84	23.89	38.67	1.00	4.20	-0.73
1986	2.51	-5.66	106.44	56.74	38.94	1.00	11.30	-0.11
1987	-0.70	29.07	38.06	92.56	33.79	1.00	5.40	0.30
1988	9.90	9.62	33.26	92.23	32.38	1.00	8.40	0.68
1989	7.20	23.37	42.76	106.78	25.38	1.00	6.70	-0.03
1990	8.20	-11.05	19.53	114.57	28.43	1.00	8.50	-0.84
1991	4.76	4.76	35.22	101.25	35.86	1.00	11.00	0.25
1992	2.92	35.77	17.34	98.99	29.45	1.00	7.20	0.54
1993	2.20	17.27	62.33	90.26	37.22	1.00	-15.50	0.11
1994	0.10	10.66	356.39	70.91	32.72	1.00	-7.70	0.00
1995	2.50	29.42	282.19	36.24	12.58	1.00	-0.10	0.11
1996	4.30	18.67	279.45	21.86	12.17	1.00	-1.60	-0.40
1997	2.70	-9.86	288.13	20.27	12.21	1.00	0.20	-0.55
1998	1.88	-18.13	301.37	21.97	18.65	1.00	4.70	0.10
1999	1.10	-0.73	8.06	64.48	26.78	0.00	8.40	-0.19
2000	3.78	10.15	15.85	79.68	25.40	0.00	2.90	0.02
2001	2.25	-2.90	34.35	51.11	22.25	0.00	4.00	0.06

Sources: IMF's IFS, CBN Statistical Bulletin; World Debt Tables

Results

Throughout the analysis we used four independent variables through which different capital flight estimates are expressed as a proportion of total stock of private real wealth. There are two residual-based capital flight estimates (the World Bank and Morgan Trust methods) unadjusted for trade misinvoicing, and the trade adjusted versions of these two estimates. Our portfolio series covers the period of 32 years (1970–2001). The method of estimation is the ordinary least square (OLS) regression with *E-Views* econometric software. The explanatory variables used are growth rate of real GDP, real interest rate differential, parallel market exchange rate premium, deficit/GDP ratio, changes in inflation rate, ratio of external debt to GDP, ratio of domestic debt to real GDP, and a dummy variable for political stability.

The results of the econometric analysis of the unadjusted portfolio variable are presented in Table 9, while Table 10 reports the results of the trade-faking adjusted portfolio dependent variables.

Table 9: Results of the econometric analysis of the regression for the unadjusted portfolio variable (CFD)

Variable	CFDWB					CFDMT				
Constant	45.22**	24.607**	20.443**	26.408**	28.697**	46.165**	24.617**	18.276**	27.085**	29.909**
	(8.278)	(3.171)	(4.420)	(5.662)	(3.128)	(8.449)	(3.152)	(4.581)	(5.914)	(3.318)
CFD_1		0.442**					0.453**			
		(2.792)					(2.887)			
CFD_2			0.507**	0.665**				0.600**	0.663**	
			(4.751)	(5.875)				(7.010)	(6.071)	
CFD_10					0.616**					0.610**
					(4.833)					(4.839)
GGDP	-0.647*	-0.421	-0.005	-0.372	-0.949*	-0.655*	-0.412	-0.349	-0.352	-0.928*
	(-1.889)	(-1.313)	(-0.020)	(-1.091)	(-1.871)	(-1.909)	(-1.285)	(-1.265)	(-1.053)	(-1.854)
GGDP(-1)	-0.471*					-0.489*				
	(-1.75)					(-1.829)				
RIRD	0.613**	0.377**	0.388**	0.724**	0.488**	0.609**	0.366**	0.605**	0.718**	0.480**
	(4.235)	(2.743)	(3.081)	(4.886)	(3.144)	(4.207)	(2.672)	(4.404)	(4.936)	(3.131)
RIRD(-1)				0.307**	0.287*				0.304**	0.282*
				(2.217)	(1.835)				(2.235)	(1.834)
PMP	0.075**	0.060**	0.030			0.075**	0.060**			
	(3.365)	(2.782)	(1.549)			(3.405)	(2.769)			
PMP(-1)	0.056**	0.037**	0.069**	0.031*		0.057**	0.037**	0.071**	0.031**	
	(3.380)	(2.273)	(5.466)	(2.037)		(3.435)	(2.289)	(6.018)	(2.105)	
GLTD	0.661**	0.366**	0.331**	0.270**		0.666**	0.360**	0.230**	0.266**	
	(11.342)	(3.323)	(4.303)	(4.365)		(11.424)	(3.267)	(3.885)	(4.381)	
GLTD(-1)					0.188**					0.185**
					(3.400)					(3.375)
DDEBT	-1.392**	-0.883**	-0.793**	-0.557**	-0.417*	-1.400**	-0.873**	-0.570**	-0.564**	-0.424*
	(-5.514)	(-3.295)	(-4.055)	(-2.989)	(1.794)	(-5.543)	(-3.266)	(-3.315)	(-3.090)	(-1.853)
DEF(-1)	0.843**	0.724**	0.473**	0.726**	0.729**	0.851**	0.720**	0.607**	0.732**	0.730**
	(2.521)	(2.331)	(2.192)	(2.583)	(2.420)	(2.545)	(2.326)	(2.594)	(2.658)	(2.455)
CINF	10.700**	7.841*	10.513**	9.919*		10.675**	7.783*	11.134**	10.029*	
	(2.175)	(1.767)	(2.632)	(1.957)		(2.170)	(1.763)	(2.563)	(2.016)	
CINF(-1)			7.129*	13.736**	10.481*			8.708**	13.685**	10.333*
			(2.022)	(2.793)	(1.967)			(2.270)	(2.837)	(1.965)
POL	15.563**	8.206	5.672			15.739**	8.137			
	(3.730)	(1.648)	(1.485)			(3.771)	(1.638)			
POL(-1)					13.285**					12.952**
					(2.691)					(2.665)
Adj. R^2	0.87	0.89	0.92	0.88	0.84	0.91	0.89	0.91	0.89	0.84
Included observations	31	31	30	27	22	31	31	30	27	22

Note: ** indicates significance at the 5% level and * at the 10% level. The t-values are in parentheses.

We introduce a lag on the dependent variable up to ten years to track the rate of adjustment of the portfolio, and also allow for testing of a one-year lag effect of the explanatory variables. This represents an autoregressive distributed lag (ADL) model, which is equivalent to or can be written as an error correction model. Assuming our variables to be I(1) cointegrated in our specification, the long-run parameters of an ADL/ error correction model can be estimated consistently by OLS (as done here) as long as any I(1) variables are cointegrated (Banerjee et al., 1993).

Running the regressions with current values with the inclusion of the lag dependent variables yielded a poor performance. Allowing the variables to feature with their one-year lag variable significantly improved the results of the regressions. While some of the variables have a delayed effect on portfolio choice, some display current and lag effects.

Table 10: Results of the econometric analysis of the regression for the portfolio adjusted for exchange rate fluctuations (CFA)

Variable	CFAWB					CFAMT				
Constant	42.823**	23.892**	30.569**	33.01**	50.325**	43.28**	23.699**	30.812**	33.543**	50.930**
	(8.322)	(3.060)	(4.868)	(8.955)	(7.545)	(8.359)	(3.032)	(4.867)	(9.266)	(7.767)
CFA_1		0.504**					0.514**			
		(3.246)					(3.340)			
CFA_2			0.465**					0.468**		
			(3.991)					(4.015)		
CFA_5				0.604**					0.601**	
				(7.535)					(7.700)	
CFA_10					0.371**					0.371**
					(4.287)					(4.370)
GGDP	-1.151**	-0.601*	-0.370	-0.155	-0.127	-1.159**	-0.587*	-0.361	-0.143	-0.123
	(-3.352)	(-1.868)	(-1.426)	(-0.566)	(-0.381)	(-3.353)	(-1.827)	(-1.381)	(-0.531)	(0.373)
GGDP(-1)										
RIRD	0.701**	0.425**	0.576	0.576**	0.485**	0.698**	0.415**	0.570**	0.570**	0.478**
	(4.309)	(2.699)	(4.690)	(4.859)	(3.631)	(4.261)	(2.647)	(4.617)	(4.901)	(3.641)
RIRD(-1)				0.298**	0.228*				0.293**	0.223*
				(2.670)	(1.967)				(2.681)	(1.959)
PMP	0.100**	0.071**	0.038*		0.030*	0.101**	0.070**	0.038*		0.029*
	(4.124)	(2.888)	(\1.856)		(1.950)	(4.119)	(2.850)	(1.847)		(1.940)
PMP(-1)	0.062**	0.030*	0.061**	0.026*		0.062**	0.030*	0.061**	0.026**	
	(3.241)	(1.837)	(5.044)	(2.075)		(3.234)	(1.828)	(5.017)	(2.127)	
GLTD	0.368**	0.302**	0.310**	0.175**	0.213**	0.364**	0.295**	0.308**	0.174**	0.209**
	(2.646)	(2.776)	(3.552)	(3.279)	(3.300)	(2.601)	(2.725)	(3.521)	(3.318)	(3.278)
GLTD(-1)	0.233*					0.237*				
	(1.964)					(1.982)				
DDEBT	-1.021**	-0.717**	-0.704**	-0.379**	-0.574**	-1.020**	-0.706**	-0.701**	-0.385**	-0.573**
	(-4.235)	(-2.975)	(-3.374)	(-2.589)	(-2.524)	(-4.203)	(-2.941)	(-3.354)	(-2.687)	(-2.563)
DEF(-1)	1.727**	1.011**	0.916**	0.733**	0.669**	1.736**	0.997**	0.909**	0.730**	0.665**
	(4.624)	(2.888)	(3.552)	(3.298)	(2.527)	(4.619)	(2.851)	(3.505)	(3.348)	(2.553)
CINF	11.897**	9.592**	10.813**	7.440*	6.865	11.898**	9.563**	10.836**	7.499*	6.868
	(2.342)	(2.134)	(2.803)	(1.836)	(1.636)	(2.328)	(2.134)	(2.798)	(1.886)	(1.664)
CINF(-1)	10.645**	6.708	9.651**	11.663**	8.042*	10.756*	6.699	9.718**	11.557**	7.945*
	(2.304)	(1.626)	(2.871)	(2.972)	(1.930)	(2.314)	(1.629)	(2.879)	(3.002)	(1.938)
POL	27.447**	13.367**	7.873*			27.653**	13.183**	7.896*		
	(5.449)	(2.202)	(1.987)			(5.456)	(2.176)	(1.989)		
POL(-1)	15.729**	9.021*				15.955**	8.983*			
	(2.720)	(1.757)				(2.742)	(1.752)			
Adj. R^2	0.90	0.93	0.94	0.92	0.87	0.90	0.93	0.94	0.92	0.87
Included observations	31	31	30	27	22	31	31	30	27	22

Note: ** indicates significance at the 5% level and * at the 10% level. The t-values are in parentheses.

Our regression results in both the unadjusted and trade adjusted capital flight equations show that four of the explanatory variables appear to explain the main movements in our dependent variable, i.e., capital flight portfolio. These variables, which are highly significant and feature consistently in all the regression runs, are the real interest rate differential, the change in inflation rate, the stock of external long-term debt and the stock of domestic debt. We notice, in general, that the same coefficients apply to the two regressions in the unadjusted portfolio variables as to the trade-faking adjusted portfolio variables. Similarly, the compositions of the explanatory variables that enter the augment are the same in each pair. This confirms one of the conclusions in the literature – that capital flight estimates from different methods are not significantly different from one another. However, the combination of relevant variable in the two groups is slightly different. Given the general robustness of these results in terms of adjusted R^2, and the consistencies of the coefficients over the various dependent variable lag lengths developed, the regressions

perform excellently. All the variables have the expected signs. The set of explanatory variables included in our regressions adequately explain the portfolio behaviour of private wealth holders. The range of the adjusted R^2 between 0.84 and 0.94 implies that the explanatory variables account for between 84% and 94% of the variations in the portfolio behaviour of the private wealth holders.

The real GDP growth rate variable has a negative sign in all the equations: deterioration in the performance of the economy increases the proportion of private wealth portfolio held abroad. Its influence on portfolio choices of private wealth holders is limited to the short term. In the trade-faking adjusted regressions, it loses its significance as the lag length of the dependent portfolio variable increases, being only significant without inclusion of lagged dependent variable and at lag length of one year. Also, its one-year lag features significantly only when the lag length of the dependent variable is not included. Apart from being significant in the absence of lag length of the dependent portfolio variable in the unadjusted portfolio regression, the significance of real GDP growth rate is delayed till the tenth lag of the dependent portfolio variable.

With respect to the four policy variables – external debt, domestic debt, budget deficit and parallel market premium – all are significant with the right signs. With the positive and significant coefficient of external debt–GDP variable, the existence of debt-driven portfolio placement abroad by private wealth holders is established. A unit-percentage point increase in the external debt/GDP ratio heaves the proportion of assets in the private real wealth portfolio held abroad by between 0.23 and 0.67 percentage points in the unadjusted portfolio regression, and between 0.17 and 0.37 percentage points in the adjusted portfolio regression. A sustained higher indebtedness up to the first decade has the tendency of further shifting private real wealth portfolio abroad by 0.12 (i.e., 0.61*0.19) percentage points in the unadjusted portfolio regression and 0.08 (i.e., 0.37*0.21) percentage points in the adjusted portfolio regression. From the unadjusted portfolio regression, the impact of a unit point increase in the domestic debt/GDP ratio yields between 0.41 and 1.40 percentage point reduction in the proportion of private real wealth portfolio held abroad, and a reduction of 0.38–1.0 percentage points in the adjusted portfolio regressions. The value of the coefficient declines as the lag length of the dependent portfolio variable increases. The negative effect of domestic debt on the proportion of foreign asset holdings may be explained from the perspective of wealth holders' response and perceived returns on government securities holdings. Unlike in the case of external debt (which is mainly within the confines of the London and Paris Clubs), private wealth holders may consider the acquisition of government debt instruments as an investment opportunity with relative assurance of returns.

The fiscal behaviour of government significantly influences the portfolio choice of wealth holders, however, with one-year lagged effect: higher fiscal deficit increases the proportion of portfolio held abroad. The coefficient declines as the lag length of the dependent portfolio variable increases. For the parallel market premium, the coefficient ranges between 0.03 and 0.10, which implies that a unit percentage point increase in the parallel market exchange rate will trigger portfolio placement abroad by between 0.03 and 0.10 percentage point. There is a combination of current and lagged effects of the parallel market exchange rate premium on portfolio decisions.

The remaining three variables – real interest rate differential, changes in inflation rate and level of risk proxied by political instability dummy (with one assigned to military rule, and zero to civilian rule) – have the a priori sign. The positive and significant coefficients of real interest rate differential confirm the rational behaviour of private wealth holders to take advantage of relative returns on investments. A percentage point increase in real interest rate differential induces a shift in the proportion of private real wealth held abroad by between 0.38 and 0.72 percentage point. Our results with respect to the coefficients of change in the inflation rate show that the portfolio behaviour of private wealth holders is influenced by inflationary tax.

The coefficients are positive and significant, implying that inflation motivates private wealth holders to shift abroad. The political stability dummy is also rightly signed, but for the unadjusted portfolio regressions it is only significant when lag dependent variable is not included. On the other hand, for the trade-faking adjusted portfolio regression, the variable remains significant up to two-year lag length of the dependent portfolio variable.

4. Summary and policy implications

Our study addressed the issue of estimation and econometric analysis of capital flight from the portfolio choice perspective. Specifically, we tried to develop a portfolio variable series for private wealth holders by first estimating the magnitude of capital flight using two different versions of the residual method (the World Bank and Morgan Trust methods) of estimation. We also adjusted for trade-faking in our capital flight estimates to derive another series of capital flight estimates. We discover that trade-faking is an important means through which capital flight is effected in Nigeria. Over the period under study (1970–2001), a significant amount of under-invoicing of exports and over-invoicing of imports took place: Exports were under-invoiced to the tune of US$2.1 billion while the over-invoicing of imports was about US$2.3 billion, resulting in total trade misinvoicing of about US$18.7 billion.

Although the real capital flight incidence in Nigeria intensified in the 1980s on the average, relative to the magnitude of real capital flight that obtained in the 1970s, there appears to have been significant slow down in the 1990s, being in some cases less than the average of the 1970s. We also computed the private real capital stock using the perpetual inventory principle, which along with the stock of real capital flight estimates gives the stock of private real wealth. The proportion of the stock of real capital flight to the stock of private real wealth with respect to each of the capital flight estimates constitutes our portfolio choice variable. Results from the econometric analysis of the portfolio variable clearly demonstrate that the portfolio choice decision of private wealth holders in Nigeria is influenced by the state of domestic macroeconomic policies. These policy variables include changes in the size of the economy, real interest rate differential, misalignment of exchange rate (widening parallel market exchange rate premium), fiscal deficit and changes in inflation rate. The debt structure in terms of external debt disbursement and domestic debt also contributes to capital flight episodes in Nigeria. The influence of the political variable is weak, however, being relevant and significant in only a few of the regressions.

The overall policy implication arising from this analysis is that intensified efforts are required to ensure and maintain sound domestic macroeconomic policy to stem capital flight in Nigeria. The slow down in real capital flight in the last decade observed in this study is a pointer to emerging trends in the resurgence of sound macroeconomic policy. There is need for policy measures capable of further reducing the degree of misalignment in the country's exchange rate, by setting the rate at a realistic level with minimal control or influence so as to close the existing premium gap. Although the exchange rate policy of the government tends to incline more towards determination by market forces, there

may be need to consolidate the current efforts through measures that increase this inclination. This is closely related to trade-faking activities, as the exchange rate misalignment is one factor driving the misinvoicing of trade transactions, which denies the country substantial capital.

Return on investment is one crucial factor in private decisions as to how and where private capital is held. There is need not only to ensure positive real interest rates, which guarantee interest on capital without being eroded by inflation tax, but also to reduce the differential with foreign real interest rates. This will provide a comparable ground to attract capital into the country and generate capital flight reversal. The current improving investment climate in the country can only be maintained if wealth holders are satisfied with economic returns on their capital. Increased liberalization of the financial sector, coupled with expansion of the sector by the minimum capital base of banks now raised to ₦25 billion (about US$190 million), stands the chance of attracting inflow of capital rather than encouraging its flight. The importance of fiscal discipline on the part of the government cannot be over-emphasized. The abstinence from fiscal deficit by the government in the past few years should be maintained. Arguably more important is the current fight against corruption, which constitutes one potent access to funds for transfer abroad.

Accumulation of external debt appears to have over the years driven capital flight in Nigeria, therefore dependence on external borrowing needs to be reduced. With the recent debt relief accepted in principle by the Paris Club, caution must be taken not to accumulate fresh external debt, but rather to take advantage of domestic borrowing to finance government expenditure where necessary. Domestic debt instruments appear to discourage capital flight, as private wealth holders perceive them as viable investment alternatives to moving wealth abroad. Government should thus depend more on domestic borrowing as a means of supplementing its resources.

In the face of current divestment of government interest in many economic activities and the privatization wave in the country, government debt policy should be geared towards drastically reducing external debt in order to create the right impression in the mind of private wealth holders. There is some movement in this direction, as the country's image appears to have improved over the years since the inception of the civilian government. Much of the credit for this goes to government economic policy – the National Economic Empowerment Development Strategy (NEEDS) – and the fight against corruption.

Notes

1. Among which are Boyce and Ndikumana, 2001; Onwioduokit, 2001; Ajayi, 1992, 1997; Murinde et al., 1996; Nyatepe-Coo, 1994; Hermes and Lensink, 1992; Ojo, 1992; Chang and Cumby, 1991; Morgan Guaranty, 1986.

2. This was around the period when the incidence of capital flight from Latin American countries was at its peak.

3. The Dooley method, although stated in a simplified form in Claessens and Naude (1993), requires some data series that are not available for Nigeria. This is acknowledged by Ajayi (1992: 25), who recognizes that some items hinder the full use of the methods because some of the statistics do not exist, such as reinvested FDI income.

4. The seven non-US currencies are the UK pound, French franc, Deutsche mark, Japanese yen, Swiss franc, special drawing right (SDR) and, since 2001, the euro.

5. Capital flight also reached its peak in 1987 for the decade of the 1980s, according to estimates by Ajayi (1992) and Ojo (1992).

References

Ajayi, S.I. 1992. "An econometric analysis of capital flight from Nigeria". Working Paper Series No. 993. World Bank Western Africa Department, the World Bank, Washington, D.C.

Ajayi, S.I. 1997. "An analysis of external debt and capital flight in the severely indebted low income countries in Sub-Saharan Africa". Working Paper No. 68. Research Department, International Monetary Fund, Washington, D.C.

Ajayi, S.I. 2000. "Capital flight and external debt in Nigeria". In S.I. Ajayi and M.S. Khan, eds., *External Debt and Capital Flight in Sub-Saharan Africa*. Washington D.C.: IMF Institute, International Monetary Fund.

Banerjee, A., J.J. Dolado, J.W. Galbraith and D.F. Hendry. 1993. *Co-integration, Error Correction and the Econometric Analysis of Non-Stationary Data*. Oxford: Oxford University Press.

Boyce, J.K. and L. Ndikumana. 2001. "Is Africa a net creditor? New estimates of capital flight from severely indebted Sub-Saharan African countries: 1970–1996". *Journal of Development Studies*, 38(2, Dec.): 27–56.

Chang, P.H.K. and R. Cumby. 1991. "Capital flight in Sub-Saharan African countries". In Ishrat Husain and J. Underwood, eds., *African External Finance in the 1990s*. Washington, D.C.: The World Bank.

Claessens, S. and D. Naude. 1993. "Recent estimates of capital flight". Policy Research Working Paper Series No. 1186. The World Bank, Washington, D.C.

Collier, P., A. Hoeffler and C. Pattillo. 2004. "Africa's exodus: Capital flight and the brain drain as portfolio decisions". *Journal of African Economies*, 13(Supplement 2): 15–54.

Collier, P., A. Hoeffler, and C. Pattillo. 2001. "Flight capital as a portfolio choice". *The World Bank Economic Review*, 15: 55–80.

Cuddington, J.T. 1986. *Capital Flight: Estimates, Issues and Explanations*. Princeton Studies in International Finance No. 58. Princeton University, Princeton, N.J.

Cuddington, J.T. 1987. "Macroeconomic determinant of capital flight: An econometric investigation". In D.R. Lessard and J. Williamson, eds., *Capital Flight and Third World Debt*. Washington, D.C.: Institute for International Economics.

Dooley, M.P. 1988. "Capital flight: A response to different financial risks". *IMF Staff Papers*, 35(3): 422–36.

Eggerstedt, H., R.B. Hall and S.V. Wijinbertgen. 1995. "Measuring capital flight: A case study of Mexico". *World Development*, 23(2): 211–32.

Erbe, S. 1985. "The flight of capital from developing countries". *Intereconomics*, 20(4, Nov./Dec.): 268–75

Hermes, N. and R. Lensink. 1992. "The magnitude and determinants of capital flight: The case of six Sub-Saharan African countries". *De Economist*, 140(4): 515–30.

Kahn, M.S. and N. Ul Hague. 1987. "Foreign borrowing and capital flight: A formal analysis". *IMF Staff Papers*,32(4): 606–28.

Ketkar, S.L. and K.W. Ketkar. 1989. "Determinants of capital flight from Argentina, Brazil, and Mexico". *Contemporary Policy Issues*, 7(3): 11–29.

Kindleberger, C.P. 1987. "Capital flight: A historical perspective". In D.R. Lessard and J. Williamson, eds., *Capital Flight and Third World Debt*. Washington, D.C.: Institute for International Economics.

King, R.G. and R. Levine. 1994. *Capital Fundamentalism, Economic Development, and Economic Growth*. Carnegie-Rochester Conference Series on Public Policy, 40.

Lessard, D.R. and J. Williamson. 1987. *Capital Flight and Third World Debt*. Washington, D.C.: Institute for International Economics.

Morgan Guaranty Trust Company. 1986. "LDC capital flight". *World Financial Markets*, 2(March): 13–6.

Murinde, V., N. Hermes and R. Lensink. 1996. "Comparative aspects of the magnitude and determinants of capital flight in six Sub-Saharan African countries". *Saving and Development*, 20(1): 61–78.

Nyatepe-Coo, A. 1994. "Capital flight in low-income Sub-Saharan Africa: The effects of political climate and macroeconomic policies". *Scandinavian Journal of Development Alternatives*, 13(4): 59–68.

Ojo, O.O. 1992. *An Empirical Investigation of Capital Flight in Selected African Countries*. Economic Research Papers No. 17. African Development Bank, Abidjan.

Onwioduokit, E.A. 2001. "Capital flight from Nigeria: An empirical re-examination". Paper presented at WIDER Development Conference on Debt Relief, Helsinki, Finland, 17–18 August.

Pastor, M., Jr. 1990. "Capital flight from Latin America". *World Development*, 18(1): 1–18.

Pinheiro, I. 1997. *Considerations about Exchange Controls, Capital Flight and Country Risk*. Institute of Brazilian Issues, The George Washington University, Washington, D.C. (Fall).

Smit, B.W. and B.A. Mocke. 1991. "Capital flight from South Africa: Magnitude and causes". *South African Journal of Economics*, 59(2): 101–17.

Walter, I. 1987. "The mechanisms of capital flight". In D.R. Lessard and J. Williamson, eds., *Capital Flight and Third World Debt*. Washington, D.C.: Institute for International Economics.

World Bank. 1985. "Case study: Mexico". In D.R. Lessard and J. Williamson, eds., *Capital Flight and Third World Debt*. Washington, D.C.: Institute for International Economics.

Appendix

Capital flight estimates for Nigeria in the literature (US$ million)

Year	Ajayi (1992)		Ajayi (1997)				Boyce & Ndiku-mana (2001)	Ojo (1992)		Murin-de et al. (1996)
	World Bank	Morgan Trust	World Bank	Morgan Trust	World Bank (adjusted for trade misin-voicing)	Morgan Trust (adjusted for trade misin-voicing)	World Bank (adjusted for trade misin-voicing) 1996 real	World Bank	Morgan Trust	Morgan Trust
1970	NA	NA	NA	NA	NA	NA	-485.1	NA	NA	NA
1971	NA	NA	NA	NA	NA	NA	-564.2	NA	NA	NA
1972	106.44	477.28	NA	NA	NA	NA	626.1	NA	NA	NA
1973	636.10	1265.38	NA	NA	NA	NA	3634.8	NA	NA	NA
1974	325.00	5995.00	NA	NA	NA	NA	1448.2	NA	NA	NA
1975	119.80	5988.60	NA	NA	NA	NA	1857.7	140	70	
1976	124.80	5524.44	NA	NA	NA	NA	4162.4	100	20	25
1977	2490.00	7021.86	NA	NA	NA	NA	9022.8	2770	2660	555
1978	508.40	2695.20	NA	NA	NA	NA	4060.4	1000	1080	1021
1979	-86.30	5659.54	NA	NA	NA	NA	-612.9	-490	-590	-598
1980	2713.30	12974.11	5738.4	14762.4	5738.40	14762.4	2093.1	2400	2370	2044
1981	2132.30	6145.22	2260	-8695	3479.59	-8695	9293.6	3800	3770	2959
1982	-3805.80	-2230.87	-3956	-8309	-4471.37	-8309	-509.4	-3630	-3610	-3863
1983	2016.10	3098.82	2518	1363	3130.42	1363	2836.1	2200	2070	408
1984	-169.80	1594.72	76	980	-1588.75	980	341.2	-160	250	-220
1985	3569.40	5385.40	1416	2206	-750.87	2206	2443.8	3850	3920	3916
1986	5502.90	6841.80	4692	3518	302.75	3518	5835.9	5040	4930	6175
1987	5874.60	7522.20	6385	6285	4335.45	6285	5762.2	7630	7580	5743
1988	1043.80	2479.12	5572	4428	5676.85	4428	2164.5	1290	1080	541
1989	-299.70	2212.46	1497	3766	986.65	3766	2314.7	2590	2460	2534
1990	NA	NA	2890	7707	2777.25	7707	5105.5	6060	6060	10876
1991	NA	NA	3498	4504	3548.34	4504	8387.7	1280	1110	2290
1992	NA	NA	NA	NA	NA	NA	5688.6	NA	NA	NA
1993	NA	NA	NA	NA	NA	NA	4066.9	NA	NA	NA
1994	NA	NA	NA	NA	NA	NA	2851.8	NA	NA	NA
1995	NA	NA	NA	NA	NA	NA	1475.5	NA	NA	NA
1996	NA	NA	NA	NA	NA	NA	3459.9	NA	NA	NA

Other recent publications in the AERC Research Papers Series:

Determinants of Private Investment Behaviour in Ghana, by Yaw Asante, Research Paper 100.
An Analysis of the Implementation and Stability of Nigerian Agricultural Policies, 1970–1993, by P. Kassey Garba, Research Paper 101.
Poverty, Growth and Inequality in Nigeria: A Case Study, by Ben E. Aigbokhan, Research Paper 102.
Effect of Export Earnings Fluctuations on Capital Formation, by Godwin Akpokodje, Research Paper 103.
Nigeria: Towards an Optimal Macroeconomic Management of Public Capital, by Melvin D. Ayogu, Research Paper 104.
International Stock Market Linkages in South Africa, by K.R. Jefferis, C.C. Okeahalam and T.T. Matome, Research Paper 105.
An Empirical Analysis of Interest Rate Spread in Kenya, by Rose W. Ngugi, Research Paper 106.
The Parallel Foreign Exchange Market and Macroeconomic Perfromance in Ethiopia, by Derrese Degefa, Reseach Paper 107.
Market Structure, Liberalization and Performance in the Malawi Banking Industry, by Ephraim W. Chirwa, Research Paper 108.
Liberalization of the Foreign Exchange Market in Kenya and the Short-Term Capital Flows Problem, by Njuguna S. Ndung'u, Research Paper 109.
External Aid Inflows and the Real Exchange Rate in Ghana, by Harry A. Sackey, Research Paper 110.
Formal and Informal Intitutions' Lending Policies and Access to Credit by Small-Scale Enterprises in Kenya: An Empirical Assessment, by Rosemary Atieno, Research Paper 111.
Financial Sector Reform, Macroeconomic Instability and the Order of Economic Liberalization: The Evidence from Nigeria, by Sylvanus I. Ikhinda and Abayomi A. Alawode, Research Paper 112.
The Second Economy and Tax Yield in Malawi, by C. Chipeta, Research Paper 113.
Promoting Export Diversification in Cameroon: Toward Which Products? by Lydie T. Bamou, Research Paper 114.
Asset Pricing and Information Efficiency of the Ghana Stock Market, by Kofi A. Osei, Research Paper 115.
An Examination of the Sources of Economic Growth in Cameroon, by Aloysius Ajab Amin, Research Paper 116.
Trade Liberalization and Technology Acquisition in the Manufacturing Sector: Evidence from Nigeria, by Ayonrinde Folasade, Research Paper 117.
Total Factor Productivity in Kenya: The Links with Trade Policy, by Joseph Onjala, Research Paper 118.
Kenya Airways: A Case Study of Privatization, by Samuel Oyieke, Research Paper 119.
Determinants of Agricultural Exports: The Case of Cameroon, by Daniel Gbetnkon and Sunday A. Khan, Research Paper 120.
Macroeconomic Modelling and Economic Policy Making: A Survey of Experiences in Africa, by Charles Soludo, Research Paper 121.
Determinants of Regional Poverty in Uganda, by Francis Okurut, Jonathan Odwee and Asaf Adebua, Research Paper 122.
Exchange Rate Policy and the Parallel Market for Foreign Currency in Burundi, by Janvier D. Nkurunziza, Research Paper 123.
Structural Adjustment, Poverty and Economic Growth: *An Analysis for Kenya*, by Jane Kabubo-Mariara and Tabitha W. Kiriti, Research Paper 124.
Liberalization and Implicit Government Finances in Sierra Leone, by Victor A.B. Davis, Research Paper 125.
Productivity, Market Structure and Trade Liberalization in Nigeria, by Adeola F. Adenikinju and Louis N. Chete, Research Paper 126.
Productivity Growth in Nigerian Manufacturing and Its Correlation to Trade Policy Regimes/Indexes (1962–1985), by Louis N. Chete and Adeola F. Adenikinju, Research Paper 127.
Financial Liberalization and Its Implications for the Domestic Financial System: The Case of Uganda, by Louis A. Kasekende and Michael Atingi-Ego, Research Paper 128.
Public Enterprise Reform in Nigeria: Evidence from the Telecommunications Industry, by Afeikhena Jerome, Research Paper 129.
Food Security and Child Nutrition Status among Urban Poor Households in Uganda: Implications for Poverty Alleviation, by Sarah Nakabo-Sswanyana, Research Paper 130.
Tax Reforms and Revenue Mobilization in Kenya, by Moses Kinyanjui Muriithi and Eliud Dismas Moyi, Research Paper 131.

Wage Determination and the Gender Wage Gap in Kenya: Any Evidence of Gender Discrimination? by Jane Kabubo-Mariara, Research Paper 132.

Trade Reform and Efficiency in Cameroon's Manufacturing Industries, by Ousmanou Njikam, Research Paper 133.

Efficiency of Microenterprises in the Nigerian Economy, by Igbekele A. Ajibefun and Adebiyi G. Daramola, Research Paper 134.

The Impact of Foreign Aid on Public Expenditure: The Case of Kenya, by James Njeru, Research Paper 135.

Njikam, Research Paper 136.

How Tied Aid Affects the Cost of Aid-Funded Projects in Ghana, by Barfour Osei, Research Paper 137.

Exchange Rate Regimes and Inflation in Tanzania, by Longinus Rutasitara, Research Paper 138.

Private Returns to Higher Education in Nigeria, by O.B.Okuwa, Research Paper 139.

Uganda's Equilibrium Real Exchange Rate and Its Implications for Non-Traditional Export Performance, by Michael Atingi-Ego and Rachel Kaggwa Sebudde, Research Paper 140.

Dynamic Inter-Links among the Exchange Rate, Price Level and Terms of Trade in a Managed Floating Exchange Rate System: The Case of Ghana, by Vijay K. Bhasin, Research Paper 141.

Financial Deepening, Economic Growth and Development: Evidence from Selected Sub-Saharan African Countries, by John E. Udo Ndebbio, Research Paper 142.

The Determinants of Inflation in South Africa: An Econometric Analysis, by Oludele A. Akinboade, Franz K. Siebrits and Elizabeth W. Niedermeier, Research Paper 143.

The Cost of Aid Tying to Ghana, by Barfour Osei, Research Paper 144.

A Positive and Normative Analysis of Bank Supervision in Nigeria, by A. Soyibo, S.O. Alashi and M.K. Ahmad, Research Paper 145.

The Determinants of the Real Exchange Rate in Zambia, by Kombe O. Mungule, Research Paper 146.

An Evaluation of the Viability of a Single Monetary Zone in ECOWAS, by Olawale Ogunkola, Research Paper 147.

Analysis of the Cost of Infrastructure Failures in a Developing Economy: The Case of Electricity Sector in Nigeria, by Adeola Adenikinju, Research Paper 148.

Corporate Governance Mechanisms and Firm Financial Performance in Nigeria, by Ahmadu Sanda, Aminu S. Mikailu and Tukur Garba, Research Paper 149.

Female Labour Force Participation in Ghana: The Effects of Education, by Harry A. Sackey, Research Paper 150.

The Integration of Nigeria's Rural and Urban Foodstuffs Market, by Rosemary Okoh and P.C. Egbon, Research Paper 151.

Determinants of Technical Efficiency Differentials amongst Small- and Medium-Scale Farmers in Uganda: A Case of Tobacco Growers, by Marios Obwona, Research Paper 152.

Land Conservation in Kenya: The Role of Property Rights, by Jane Kabubo-Mariara, Research Paper 153.

Technical Efficiency Differentials in Rice Production Technologies in Nigeria, by Olorunfemi Ogundele, and Victor Okoruwa, Research Paper 154.

The Determinants of Health Care Demand in Uganda: The Case Study of Lira District, Northern Uganda, by Jonathan Odwee, Francis Okurut and Asaf Adebua, Research Paper 155.

Incidence and Determinants of Child Labour in Nigeria: Implications for Poverty Alleviation, by Benjamin C. Okpukpara and Ngozi Odurukwe, Research Paper 156.

Female Participation in the Labour Market: The Case of the Informal Sector in Kenya, by Rosemary Atieno, Research Paper 157.

The Impact of Migrant Remittances on Household Welfare in Ghana, by Peter Quartey, Research Paper 158.

Food Production in Zambia: The Impact of Selected Structural Adjustments Policies, by Muacinga C.H. Simatele, Research Paper 159.

Poverty, Inequality and Welfare Effects of Trade Liberalization in Côte d'Ivoire: A Computable General Equilibrium Model Analysis, by Bédia F. Aka, Research Paper 160.

The Distribution of Expenditure Tax Burden before and after Tax Reform: The Case of Cameroon, by Tabi Atemnkeng Johennes, Atabongawung Joseph Nju and Afeani Azia Theresia, Research Paper 161.

Macroeconomic and distributional consequences of energy supply shocks in Nigeria, by Adeola F. Adenikinju and Niyi Falobi, Research Paper 162.

Analysis of factors affecting the technical efficiency of arabica coffee producers in Cameroon, by Amadou Nchare, Research Paper 163.

Fiscal policy and poverty alleviation: Some policy options for Nigeria, by Benneth O. Obi, Research Paper 164.

FDI and Economic Growth: Evidence from Nigeria, by Adeolu B. Ayanwale, Research Paper 165.

Acknowledgements

The author gratefully acknowledges the financial support of the African Economic Research Consortium (AERC) to conduct the study that resulted in this paper. The author, however, takes the responsibility for all errors.