Thesis

By

AGU, Chukwuma

University of Nigeria, Nsukka

Department of Economies

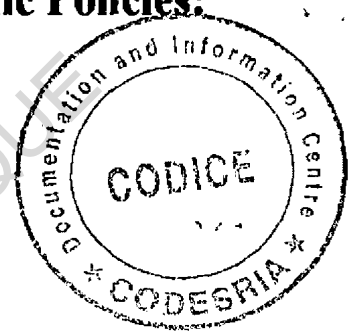
Capital Flight and Domestic Macroeconomic Policies: Evidence from Nigeria

2007

University of Nigeria, Nsukka

Department of Economics

Capital Flight and Domestic Macroeconomic Policies: Evidence from Nigeria



PhD Report

Name of Student: **Chukwuma Agu**
Registration Number: **PG/PhD/02/33600**
Supervisor: **Prof N. I. Ikpeze**

2007

CAPITAL FLIGHT AND DOMESTIC MACROECONOMIC POLICIES: EVIDENCE FROM NIGERIA

A PhD RESEARCH THESIS PRESENTED TO THE DEPARTMENT OF ECONOMICS,

UNIVERSITY OF NIGERIA, NSUKKA

IN PARTIAL FULFILLMENT OF REQUIREMENT FOR THE AWARD OF DOCTOR OF PHILOSOPHY IN ECONOMICS

BY

AGU, CHUKWUMA
PG/PhD/02/33600

2007

Approval

Prof. N. I. Ikpeze

(Supervisor)

Prof. F. E. Onah

(Head of Department)

External Examiner

Internal Examiner

Dean, Faculty of Social Sciences

Dedication

To all those who sincerely long for and work towards a functional educational environment in Nigeria; and who use their academic endowments, not as a means to prey on the society but to improve on the lot of the people.

Acknowledgement

The conception for this work was partly that of my first Supervisor, Prof Chukwuma C. Soludo who had to leave for national assignment. I owe him much, not just for this work, but also for giving me the picture of the genuine economist that I am still struggling to reproduce. My supervisor, Prof. Nnaemeka I. Ikpeze has been so fatherly; never tired of my calling on him, often at odd hours for help. Working with him made this process a continual delight. To both, I am eternally grateful.

I can only pour out a tiny part of my adoration to my gift of a wife, Chioma whose all-round support makes me complete. Pearl, I appreciate your prayers, encouragement as well as allowing me use part of the time that is rightfully yours for work. I also want to say thank you to my other family members and friends – My mum Patience, brothers, Israel and David, sister and niece Ugo and Chisom as well as Elijah, among others for their continual support. Also to my friends and members of the Dominion Network Partners – Amaechi, Uche, Afam, Ken, Okey, Emeka and Goodhead.

My warm gratitude goes to the management and staff of the African Institute for Applied Economics, Enugu which gave me so much encouragement and provided me facilities that enhanced the work. I particularly thank my research colleagues and other fellows of the Institute for all the support over the years. I wish to also thank the staff of the Department of Economics, University of Nigeria, Nsukka for their support. In particular, I have to mention the Head of Department, Prof F. E. Onah, Dr. Hycienth Ichoku, Dr. William Fonta, Patterson Ekeocha, Moses Oduh, Mrs. Jane Nwaosuagwu among a host of others who are ever eager to help out in whatever way they can. I will also like to thank participants at the Departmental postgraduate seminars and my Postgraduate Colleagues at the Department who always have constructive suggestions on means to improve on the work.

My thanks also go to the African Economic Research Consortium (AERC), Nairobi Kenya and the Council for the Development of Social Science Research in Africa (CODESRIA), Dakar Senegal for providing financial support for the work. I also wish to thank an anonymous reviewer of the AERC and another of the Journal of African Economies, New York University both of who made very insightful comments on earlier drafts of the work.

A number of other persons have made very helpful suggestions that helped to improve the overall quality of this work. In this category are researchers at the Centre for the Study of African Economies (CSAE), Oxford University, participants at the 2006 CSAE Conference on African development held

at the St. Catherine's College (in particular Anke Hoeffler who discussed the work), participants at the International Development Economics Associates (IDEAs) 2006 Conference in Shanghai, China (in particular Charles Abugre). To you all I am grateful for sparing your time to make inputs into this work.

If the LORD had not been on our side--, let Israel say--, if the LORD had not been on our side... Our help is in the name of the LORD, the Maker of heaven and earth". (Psalm 124). Here again I acknowledge that "every good and perfect gift is from above, and cometh down from the Father of lights, with whom is no variableness, neither shadow of turning". And so I join the Heavenly hosts to say, "Now unto him that is able ... to the only wise God our Saviour, be glory and majesty, dominion and power, both now and ever.

Chukwuma Agu
2007

Abstract

There is no scarcity of empirical studies into the problem of causes of capital flight or the associated attempt to relate the phenomenon to economic growth and other macroeconomic stability indicators. Studies that undertook that include Onwuoduokit, (2002), Ajayi (1992, 2002) Pastor (1990) among others. The emerging list of causal variables is equally diverse - ranging from balance of payments disequilibrium and real exchange rate distortions to political risks and other social imbalances... and growing! Expectedly too, different works place different premiums and weights on different causal variables. Indeed, distilling from the menu of variables that influence capital flight will continue to be a major challenge to macroeconomic researchers. One thing however lacks – a systematization of the information distilled from these works for a theoretical understanding of the channels and nature of the relationship between capital flight and its key determinants. There is the added debate on how effective or otherwise domestic fiscal and monetary policies can be in reducing capital flight, either through impacting on these causes or by directly influencing capital flows. It is in these two areas that this work attempts to add value. Abstracting from and extending a model of capital flight and economic development, it attempts to evaluate the conditions leading to and channels of capital flight. It evaluates the concept of risk and returns and presents a perspective on assessing their contributions to capital flight using a micro portfolio management model. A central thesis of the work is that investing agents do not only consider risks versus returns in a country but also risks and returns in any country vis-à-vis risks and returns in other countries in deciding where to invest. It also analyzes the impact of political risk and concludes that it is central to capital flight. The second part of the work proposes a macroeconomic model with the intent first of empirically evaluating the place of risk in capital movements and thereafter to evaluate the effectiveness of domestic fiscal and monetary policies in combating capital flight. It found evidence in support of risk and volatility as influencing the outflow of capital and of capital flight responding directly to capital controls, but could not find evidence to support indirect control of capital flight through using fiscal and monetary policies to control uncertainty.

Table of Contents

Chapter One

Introduction

1.1 Background

Some findings in recent literature and confirmed by country experiences are that the conventional analysis of risk-return correspondence in international capital movements is not enough to fully explain the large variations existing in low income countries' capital accounts. In particular, the idea of a possible foreign exchange-interest rate Laffer curve in the management of capital flows and for controlling capital flight is coming under intense scrutiny and criticism. Krugman (1998), Pakko (1999) among others contends that not only is the theory not helpful in the presence of the high risk premium plaguing most developing countries, but also it is not supported by country experiences, particularly given the experiences of many Latin American Countries. To be sure, a few more elaborate works in the literature include productivity returns to the analysis. But the fact remains that there is more to risk analysis associated with flight capital than just interest rate, foreign exchange and productivity. This is especially so if and when the source of capital under consideration is domestic. For external capital, the idea that foreign exchange and short term security trading could have given rise to the inflow of the capital in the first place, in which case, it is understandable if it also leaves when the conditions attracting it no longer exist, is intuitively compatible with facts of experience. But for domestic capital sourced under conditions of uncertainty, poor returns in the form of low interest rate or higher risk in the form of exchange rate volatility are not strong enough reasons. There are rather more reasons to consider the 'productivity returns' introduced by some recent authors.

But the rejection of conventional wisdom in this respect poses its own problem namely finding a credible alternative for analysis of causes/consequences and prescription of solutions to the massive capital outflows that characterize many developing countries and which are of great policy concern. To what extent is there really a relationship between capital flight and domestic policy instruments? Particularly, there are unresolved questions regarding the powers of a country's domestic monetary and fiscal policies in taming the movement of flight capital away from its borders. For example, Cline (1985) posits that it is largely within the power of debtor countries to limit capital flight by adopting appropriate domestic policies on interest rates, the exchange rates, capital account convertibility, and fiscal balance. But this has not been fully supported by country experiences either. Besides, the trade off between the goals of constrained capital movements and traditional economic policy goals can be destabilizing. For example, in the aftermath of the capital accounts crisis in Argentina, the quest for credibility and domestic stability by policymakers in that country led to policies of fixed exchange

rate, capital account openness and even consideration of dollarization of domestic assets and liabilities. While these yielded marginal gains in terms of fiscal stability and inflation control, it also had enormous negative implications for employment, income distribution and job security and indeed led to an overzealous pursuit of fiscal balance that threatens national autonomy in monetary and exchange rate policies (Palley, 2001). As such, while theoretically nations could make trade offs between capital movements and domestic control of policies, the exact location of the optimal point for such trade-off is undefined and amorphous. But that is not all the problem.

While trans-border capital intrinsically shares a number of characteristics, some are considered 'flight' and viewed as inimical to growth while others are considered 'direct investment' and courted. To some analysts, this dichotomy is merely semantic while for others, it poses policy challenges. For policymakers in Africa, the challenge is real; whether all capital movements out of the region automatically translate to flight or not is immaterial. The continent badly needs development capital, is losing capital very fast and is neck-deep in debt owing to the demand for investible capital. Meanwhile returns to capital in the continent relative to its competitors are at least four times as high (Pastor 1990). As such, whether theoretically, politically or economically, there is no justification for net capital movement out of the region – at least not for now. Besides, memories of the bitter experiences of financial crises in some Latin American and Asian countries in the late 1990s still haunt policymakers in many developing regions especially SSA. Given the fragile structure of both the capital and money markets – and indeed the weak economic base – of these economies, it is doubtful if many SSA countries can survive the sort of debilitating funds crises that rocked these other regions. As such proper understanding of the nature and implications of capital flight in the region is highly important.

1.2 Statement of the Problem

Whether based on economic theory or casual observation, there is a consensus that it is counter-intuitive that capital should flow from developing countries (with much higher returns to investment) to the developed world, with lower returns. Both neoclassical and endogenous growth theories predict movement of capital from areas of high concentration with decreasing returns to scale to areas of low concentration, with increasing returns to scale (see Romer 1996; Agenor, 2000). Yet developing countries continue to suffer debilitating outflows of development capital despite having multiples of returns to investment compared to most developed countries.

developing countries. Reversal of the capital flows also has the potential of providing the quantum

from the developed world. It is a fact that both aid and credit windows have dramatically reduced in size within the last decade and the developing world is ... relief for decades. Meanwhile, it is believed in some quarters that should Africa and Latin America get back their stock of capital in other regions, they would be debt-free and may never need aid. Boyce and Ndinkumana (2001) estimate that compared to the size of the region's debt, capital flight from SSA put at about $193 billion in 1996 dollars between 1970 and 1996 makes the region a net creditor to the world. The figures are even more intriguing when imputed interest earnings are added to the accumulated stock of capital abroad bringing the total to $285 billion against a total debt stock of $178 billion. Ndinkumana and Boyce (2002) noted that for every dollar of external borrowing in SSA; roughly 80 cents flowed back as capital flight in the same year and Pastor (1990) estimates that capital flight bled Latin America of $151 billion between 1973 and 1987. His estimates are that approximately 43% of total debt build-up in the region within the same period was used to finance capital flight and a high percentage of new debt in most cases "slips out" again as flight capital

The debt-flight nexus complicates the analysis for many developing countries and reduces the options for effective policy intervention. It perpetuates the debt crises not only through diversion of savings but also because retention of assets and earnings abroad erodes the domestic tax base and lead to more budget deficits that require contracting further debts to finance. Besides, the non-repatriation of earnings on foreign assets retards growth as it exacerbates the foreign exchange shortage that constrains the import of capital goods necessary for development. But importantly too, it raises instability in an economy, and sends (possibly wrong) signals of the potentials of the economy thereby putting monetary and fiscal policies on the defensive. Resource constraints generally entail reductions in the options for macroeconomic intervention open to governments, but also, it increases the risk perception of the countries in question and tends to lead to even more outflows of capital.

While this last point seems intuitive enough, it is a point of contention in the literature. In particular, Cline (1985) claims that it is largely within the power of debtor countries to limit capital outflows by adopting appropriate domestic policies on interest rates, exchange rates, capital account convertibility, and fiscal balance (see also Ajayi 2002). But this stance is very debatable. For most SSA countries, the movement of capital out of the region is persistent despite long years of attempts at forcing the macroeconomic policy numbers to add up. And so far, it is difficult to assert with certainty that capital

flight persists because macroeconomic policy numbers did not add up and even more difficult to assert that it persists despite the policy numbers having added up. This is because empirical works on capital flight have generally been concerned with definitional and measurement issues and have not critically explored the extent to which macroeconomic policies affect capital flight for a typical highly indebted poor country.

Recently, some attempts have been made to present capital flight as a microeconomic portfolio choice phenomenon (see Collier et al 1999). But in several cases, such capital flight theorizing is presented in a simplified risk-return assessment with the conventional prescription of 'capital flees when risks are greater than returns and is attracted when returns are greater than risks'. But such prescriptions, intuitive as they appear, are flawed as they follow the tradition of presenting the theory of investment as being affected by its own costs and returns only[1]. The conventional analysis of risk-return correspondence in international capital movements is not enough to fully explain the large swings in low income countries' capital accounts. In particular, the idea of a possible foreign exchange-interest rate Laffer curve in the management of capital flows and for controlling capital flight is coming under intense scrutiny and criticism. It then follows that there may be need to re-conceptualize the theoretical presentation of risk and returns in capital movement within a comparative context. That is one major contribution that this work intends to make.

1.3 Objectives of the Work

The work proposes to present a comparative analysis of capital flight within the portfolio choice framework – an extension of the risk-return assessment currently being used in understanding capital flight and growth. It also proposes to formulate a medium-sized macroeconomic model of Nigeria which shall be used to simulate the relative impact of alternative monetary and fiscal policy measures in ameliorating or accentuating capital flight. The broad objective is to contribute to the debate on and understanding of the mechanism of capital flight from developing countries, with particular reference to capital flight from Nigeria. Specifically the work intends to:

- Extend the model for analyzing the theoretical relationship between capital flight and economic growth and thus provide deeper understanding of the theoretical relationship between capital flight and risk assessment of potential investors and

[1] Pyndick 1991 challenged this idea leading to the rise of a brand of investment theory that incorporates the triune characteristics of investment as being uncertain, partially irreversible (with sunk, irretrievable costs) and therefore having an option value of waiting.

Provide initial estimates of the possible impacts of changes in different monetary and fiscal policy measures and domestic country risks in accentuating or ameliorating capital flight

1.4 Research Hypothesis

The theses proposed by this work fall into two broad categories – a theoretical hypothesis and an empirical hypothesis. The alternative hypothesis proposed in the theoretical section is that conventional risk-return analysis is incomplete in providing a thorough understanding of the factors affecting capital flight. The null hypothesis in the empirical section submits that capital movements are not affected by risk factors and that such risk factors are not amenable to controls by fiscal and monetary policy instruments.

1.5. Expected Impact of the Work

To test the theoretical hypothesis, this work builds a model of capital flows with a micro foundation of portfolio choices among investing units in two structurally different countries. The empirical model will be tested using a macroeconomic model which captures interactions between selected risk variables, capital flight and fiscal/monetary policy instruments. The work intends to make contributions in two major ways

- First it will provide deeper understanding of the theoretical relationship between capital flight and risk assessment of potential investors in developing countries and thus explain the persistence of capital flight and low FDI flows to these countries despite anticipated high returns to investment.
- The work will also provide initial estimates of the impact of domestic country risks and policy measures in accentuating or ameliorating capital flight. This is of immense relevance to many developing countries especially Nigeria where paucity of investible capital is one of the key threats to effective growth in general and the current reform programme of the government in particular. Indeed, the country had made sustained efforts to attract foreign investment and limit the outflow of capital from the economy as part of its on-going reform programme.

1.6. Limitations of the Work

A major point emanating from surveyed literature is the ambiguity and difficulty associated with defining and measuring both political risks and capital flight. The measures adopted by any one research work have implications for the outcome. This work does not intend to re-define the terms or deal wholly with the ambiguities raised in both definitions and measurements. However, it intends to regularize the theoretical relationship between political risks (broadly defined) and capital flight (in

erms of outgoing capital). This will be taken on a more general term, especially in the first section lealing with capital flight and political risk. Then, within the context of a macroeconomic model of Nigeria and given data between 1970 and 2003, the work will empirically examine the relationship between risks and capital movements. In this latter section, different indicators of risk (including regime changes, coups, output variability, real exchange rate volatility and disputes and/or man-days lost owing to disputes) will be used as proxies at different times. The second section is not exclusively about modeling political risk as much as it is about the risks in general and capital flight. In this section, any and/or a combination of the risk variables noted will be assumed to impinge on capital movement and such assumption will be tested with available data.

Chapter Two

Literature Review

2.1 Theoretical Literature on Capital Flight

A knotty issue in capital flight literature is the underpinning argument for the 'arbitrary' classification and nomenclature of 'flight' for some capital and 'FDI' for others. The use of 'flight' for capital movement across borders in certain circumstances is considered pejorative by some in the literature. The argument is that there is inconsistency when capital from other quarters are termed FDI and encouraged while those considered flight capital are discouraged (Onwioduokit, 2002; Schneider, 2003). Specifically, optimal portfolio choice for individuals in any country, especially in a globalizing world necessarily implies the diffusion of investment among different countries, based on their risk-return perception of assets in those places. Conceivably therefore, such discriminatory classification is considered unwarranted.

But the problem is that capital is flowing from areas of high returns to areas of comparatively low returns, much against predictions of economic theories. In particular, it is estimated that Africa has as much as four times the rate of return to capital as Europe and North America. This naturally, given the predictions of convergence theory should translate to influx of capital into the continent. In a world of complete information and negligible transactions costs, the rates of return to capital would be expected to equalize across countries and markets, so that agents are indifferent between investing domestically and investing abroad. In such a world, evidence of systematic capital outflows would imply that returns to capital are systematically higher abroad than at home. Following the logic of diminishing returns, the rate of return to capital should be higher in capital-scarce developing countries than in richer countries, and capital should flow from the latter towards the former. But this is not so. Capital rather has moved en masse out of the continent. 'Flight' is therefore used to qualify this perceived anomaly. Capital movement from rich industrial countries is in search of higher returns, but it is not clear that capital movement from poorer nations is also in search of higher returns only. In many cases, stability and security are more important factors affecting such movements. In this case then, the use of flight is meant to picture the larger spectrum of causes different from the standard neoclassical variables. Where, as is the case of many African countries, the major motivation is uncertainty in prevailing socio-political environment; then a case is considered to have been established for using *flight* to describe the capital movement. Schneider (2003) following closely from Kindleberger (1937) captures this well when he notes "capital flight ... is defined as that part of the outflow of resident capital which is motivated by economic and political uncertainty..."

Nor is the problem with capital flight only in terms of the variations in theoretical conception. The empirical estimation of what constitutes flight as a subset of broad private capital flows is often as problematic leading to varying estimates and definitions of what constitutes capital flight. Like the real exchange rate, while conceptually admitted as being a problem, capital flight is difficult to track. The disagreement in concept also shows up in the ambiguity arising from an attempt to distinguish capital outflows responding to positive incentives and returns across the border from those responding to negative incentives and risks within a country. Particularly, the line of distinction is often very slim and defined by the even less tangible and measurable motives of private agents. It therefore comes as no surprise that several measures of capital flight are available in the existing literature (Kant, 1996, Lensink et al 1998, Hermes and Lensink, 2001). Three methods of measuring capital flight have emerged over time. The ***Residual Method*** measures capital flight indirectly from balance of payments statistics by comparing the sources of capital inflows *(i.e.* net increases in external debt and the net inflow of foreign investment) with the *uses* of these inflows *(i.e.* the current account deficit and additions to foreign reserves). If the sources exceed the uses of capital inflows, the difference is termed as capital flight. It is so far the most widely used and currently has a number of variants among them World Bank (1985), Morgan Guaranty (1986) and Cline (1987). The second method referred to as the ***Hot Money Method*** measures capital flight by adding up net errors and omissions and non-bank private short-term capital outflows (Cuddington, 1986; Gibson and Tsakalotos, 1993). This measure reflects the idea that capital flight goes unrecorded, due to the illegal nature of these capital movements. It is argued that the unrecorded capital movements appear in the net errors and omissions. Moreover, by concentrating on short-term flows, medium- and long-term outflows are excluded, which are considered more *normal* in character. The third is the ***Dooley Method*** (proposed by Dooley, 1986). It defines capital flight as all capital outflows based on the desire to place assets beyond the control of domestic authorities, excluding normal outflows. Consequently, this measure includes all capital outflows that do not receive and/or register interest payments. However, Claessens and Naudé (1993, pp.5-7) show that the calculation of capital flight as proposed by Dooley (1986) is in fact partly based on and gives rather identical magnitudes as the Residual Method, although it uses a different concept of capital flight.

The causes of capital flight have been a subject of much debate. Lensink et al (1998), Hermes and Lensink (2001) among others identify governance and political risks as the key factors responsible for 'counter-intuitive' capital flows. Cuddington (1986), Ajayi (1992) and Onwioduokit (2002) identify macroeconomic mismanagement in the form of expansive fiscal and monetary policies and exchange

rate overvaluation and misalignment as creating uncertainty and making the domestic environment unattractive for investment. McKinnon (1999) identified the whole gamut of exchange rate and regime-related disturbances as risk-boding even for a net absorber of private capital. Other factors identified in the literature include declining terms of trade, changes in tax regimes, budget deficits, financial repression and debt (Pastor, 1990; Ul Haque and Khan, 1985; Khan and Ul Haque, 1987). Duwendag (1989) particularly notes that the relationship between poor countries' indebtedness and capital flight is a bit complicated. Much of the funds contracted in debts aimed at financing short term balance of payments crises usually found their way back into foreign accounts of private residents without being put to use in the countries where they were originally designated. This was accentuated by Pastor (1990:4) in discussing the Brady Plan of the Bush (Snr) administration who insists that capital flight impedes the resolution of the overall debt problem of the Latin American (and by extension developing countries') debt problem because the continued extension of new credit or debt relief is counterproductive when a high percentage of the new resources 'slips out' of the region again as flight capital. He estimates that approximately 4.3 percent of the debt build-up in the region was used to finance capital flight

While there is some agreement in the risk-content of the factors determining capital flight, there is very little on what constitutes optimal policy response to the problem. A number of the identified factors are external and probably not directly influenced by domestic macroeconomic policies. The variables lumped under 'relative country risk' in Ajayi, 1992, 2002 and Onwioduokit, 2002, among others are wide and varied. In terms of policy response, they also often require varying (and sometimes conflicting) measures to contain. For many poor countries therefore, with segmented product and factor markets and subject to a range of external shocks, there are genuine questions as to the practicality and feasibility of policy combinations that can stop or reverse capital flight. But Cline, 1985 (see Ajayi 1992, 2002) claims that it is largely within the power of debtor countries to limit capital outflows by adopting appropriate domestic policies on interest rates, the exchange rates, capital account convertibility, and fiscal balance (Ajayi 2002). McKinnon (1999) and a number of other researchers have extensively pursued the efficacy of policies in this direction and a number of (at least theoretically plausible) policy recommendations have been proffered. But to what extent these are practicable for a typical developing country especially given the pressure for further liberalization of the capital market is not known. If as Pastor (1990) noted and confirmed by a number of other works (Ajayi 1992, 2002 among others), there is a high correlation between debt accumulation/overhang and capital flight, what are the policy options open to an average developing country and what are the rooms available for effective combination of monetary and fiscal policies in engaging the movement

of capital away from the shores of the country? This is part of the questions that this work sets out to answer.

2.2 Empirical Findings on Capital Flight

The literature on the empirical determinants of capital flight has become quite substantial, and particularly so for sub Saharan Africa since the 1980s and these have involved the use of diverse methodologies (Table 2.1). Expectedly, there are variations in results, due partly to differences in the measurement of capital flight and partly to differences in econometric techniques and specifications and country peculiarities. However, some important empirical regularities have emerged from the studies. Before looking at such regularities, an attempt is made underneath to survey a few of these works.

Ljungwall and Wang (2004) use quarterly balance of payments data over the years 1993:1 – 2003:4 to explore the determinants of China's capital flight. The long relationship and dynamic interactions among the variables are examined using cointegration and innovation accounting methodology. The choice of determinants used for the work was based mainly on stylized facts from works in the existing literature – and included such causal factors as real output, external debts, real exchange rate, interest rate differentials, domestic inflation and foreign direct investment default ratio (FDR)[2]. They applied the Vector Autoregression (VAR) model and used the Augmented Dickey-Fuller (ADR) unit roots test system to establish cointegration among the variables. A key finding of the work is that capital flight is stimulated by external debts growth. According to the authors, this link is explained by the 'Trinity' in the sense that when the authorities insist on keeping a rigidly pegged Yen exchange rate and monetary policy autonomy, incurring external debts is a ready channel for large scale capital inflows and outflows. Given that the country's external debts are state-guaranteed, there is intensive moral hazard occasioned by expectation of government bail-out by debtors when they over-borrow from abroad. When debtors perceive that their extra borrowings are no longer to be guaranteed by the state, or covered by the investment returns, they hoard their borrowings abroad leading to capital flight. This phenomenon does not seem to respect China's strict financial account controls. Thus, the authors recommend a reform of the external debts management and fiscal resource allocation in the country as a means of downsizing capital flight.

[2] The foreign direct investment default ratio reflects investors' rating on the long run risks of facilitating capital flows in a country. A high FDR implies high uncertainties and hence, there may be a capital flight from the country

Beja et al (2005) measure capital flight from Thailand over the period 1980 to 2000 and analyze the relationship between capital flight and capital inflows, economic growth and crisis, and financial liberalization. They defined capital flight as net private capital outflows from a capital-scarce developing country and measured it using the residual method, which measures capital flight as the difference between the sources and uses of funds. In particular, the work sets out to illustrate why capital flight is an important concern for Thailand. To do this, it explores five issues linked to capital flight. The first is the link between capital inflows and capital flight on the understanding that while capital inflows directly influence capital flight, it is possible that these inflows will be accumulated, especially when the economy is expanding, but will exit in the future when economic conditions are no longer favorable to capital (such as an economic crisis). They authors were able to confirm relatively substantial capital inflows in periods of economic expansion with capital inflows being larger than capital flight and the reverse in periods of economic crisis – with capital flight exceeding capital inflows. They also investigated the relationship between economic growth and capital flight. Here, conventional literature analysis suggests that economic growth implies high returns to capital and a generally attractive investment environment. As such, high growth periods will imply low capital flight. This again they confirmed in the case of Thailand, finding a negative relationship between capital flight and economic growth. Thirdly, they explore the relationship between economic shocks and capital flight[3] and obtained evidence in support of the stance that economic crisis induces capital flight as capital flight was especially high during these crisis periods in Thailand. The fourth area of enquiry for this work is the relationship between liberalization and capital flight. Under this, there are contending arguments, one in favour of capital account liberalization on the understanding that it discourages capital flight and the other against capital account liberalization with the argument that it leads to higher volatility and uncertainty which triggers capital flight. The findings support the argument against liberalization. Finally, the work simulated alternative growth scenarios given assumptions about investment of the funds that fled during capital flight. In other words, they explored what additional output and employment could have been generated had the funds that fled the country been repatriated. First, they found that total real capital flight for the two decades was US$118.1 billion in 1995 prices, or 110% of real gross domestic product (RGDP) in 2000. Counting interest earnings, the study obtained a total of US$155.2 billion by 2000, which is an estimate of the total opportunity cost of capital flight, or 150% of total output in 2000. These estimates are by no means negligible and go a long way to substantiate the point about the negative implications of capital flight

[3] In Thailand, the period 'coinciding' with this phenomenon include the 1983-1987 Banking Crisis in Thailand and the 1997-1998 Asian Financial Crisis which affected most countries in Asia.

and the extent of importance that should be attached to the phenomenon in both research and policy circles, especially as it concerns developing countries.

Ndinkumana and Boyce (2002) investigate the determinants of capital flight from 30 sub-Saharan African countries[4], 24 of which are classified as severely indebted low-income countries for the period 1970-1996. The work aims to provide preliminary answers to the question of why countries borrow heavily at the same time that capital is fleeing abroad. They used a variant of the residual method for computation of capital flight and based on the difference between the inflows of foreign exchange from external borrowing and the uses of foreign exchange reported in the IMF's *Balance-of-Payments Tables*. They refined the measure by incorporating adjustments for trade misinvoicing and for the impact of exchange rate fluctuations on the dollar value of external debt and converted nominal values of annual capital flight to real values using US producer price index. The independent variables in their model include capital flows and stocks, captured by the annual change in total debt stock (adjusted for exchange rate fluctuations) and the stock of debt used as a measure of debt overhang. Annual growth rate of real per capita output is used as indicator of macroeconomic environment. They proxied fiscal policy by primary budget deficit, the overall fiscal deficit, and the tax/GDP ratio. They also captured domestic investment risk using percentage change in the real exchange rate and the spread between the domestic lending and deposit rates with adjustment for depreciation of local currency. The work also tried to capture country financial development using two measures of financial intermediation – the ratio of total liquid liabilities (M3) to GDP, which serves as a proxy for the size of the financial system; and credit to the private sector as a percentage of GDP, a measure of availability of credit in the domestic financial market. They also added five indicators of governance and political environment - political freedom and civil liberty; voice and accountability; government effectiveness; risk of contract repudiation; and corruption. They first estimated the equations using annual panel data in order to both maximize the degrees of freedom and as well capture dynamic effects of past capital flight through the inclusion of lagged values. Their results showed debt and external borrowing as the strongest single determinant of capital flight. This result was robust even in cross-sectional specification with coefficients ranging between 0.7 and 0.9 with an average of 0.8.

[4] The sample include Angola (1985-1996), Benin (1974-1996), Burkina Faso (1970-1994), Burundi (1985-1996), Cameroon (1970-1996), Central African Republic (1970-1994), Congo, Dem. Rep (1970-1996), Congo, Rep (1971-1996), Côte d'Ivoire (1970-1996), Ethiopia (1970-1996), Gabon (1978-1996), Ghana (1970-1996), Guinea (1986-1996), Kenya (1970-1996), Madagascar (1970-1996), Malawi (1970-1994), Mali (1970-1996), Mauritania (1973-1995), Mauritius (1975-1996), Mozambique (1982-1996), Niger (1970-1995), Nigeria (1970-1996), Rwanda (1970-1996), Senegal (1974-1996), Sierra Leone (1970-1995), Sudan (1970-1996), Togo (1974-1994), Uganda (1970-1996), Zambia (1970-1991) and Zimbabwe (1977-1994)

This was interpreted to mean that for every dollar borrowed, 80 cents flowed back as flight capital in the same year. . A major contribution of the Ndinkumana and Boyce work is the demonstration of the importance of debt-fueled and debt-driven capital flight. They also identified *hysteresis* (temporal persistence) in capital flight for most of the countries. On the macroeconomic environment, they found that growth rate differential between the modeled countries and their OECD counterparts is negatively related to capital flight indicating that higher growth lowers the phenomenon of capital flight. The impacts of fiscal policy measures were generally ambiguous while indicators of risk and returns used in the equations were not very significant either. They also found that credit to the private sector has negative but statistically significant impact on capital flight. Political and governance indicators also did not seem to matter much (they were insignificant).

Felding (2003) used quarterly time series data from Israel to investigate the dynamics of the causal links between the intensity of civil conflict and capital flight. The data period covered the *Intifada* in Israel. In the empirical model, he allowed the portfolio shares of domestic residents, as measured by capital ratio, to vary with both political and economic factors. He could not model the real exchange rate and the industrial wage; instead he used their lags as instrumental variables. The work specified equations explaining the share of capital wealth held in the form of physical capital abroad as determined by international interest rate differential specifically as capturing relative rate of return to capital between Israel and the rest of the world circumscribed by the purchasing power parity real exchange rate and real industrial wage ratio. The work finally incorporated the differential growth of output in Israel and the US. Indicators of risk used in the work include fatalities in violent political incidents in Israel in each quarter and the total number of days in a quarter on which either the Israel-West Bank or the Israel-Gaza borders were closed. The work used quarterly sample running from 1988 to 2001 and a two period lag. It was found that higher differential between domestic and foreign interest rates or a real exchange rate appreciation discourage capital flight. An increase in relative wage rate has the opposite effect. The work also found that a higher rate of economic growth in such allied country as the US also encourages capital flight in Israel. Increases in the level of political violence, measured by fatality in conflicts induce capital flight, and some of such capital flight happens within the same quarter. On the other hand, relatively severe border closure policy seems to stem some of the capital flight suggesting that investors perceive a more restrictive closure policy to be associated with greater security, perhaps in terms of the expected level of future violence. In return, using a conflict model, the work also tried to evaluate the determinants of conflict. Using a model that embodies a combination of political and economic factors, disaggregating fatalities according to the nationality of the victim, the work also constructed two time series, one for Israeli fatalities and the

other for Palestine fatalities, each equation determined by its own past values, number of border closures, lagged value of FDI, lagged growth of Jewish settlements in the West Bank and Gaza, and a dummy for the second *intifada*[5]. This second set of equations indicate that the conflicts were temporally dependent and persistent. But another interesting finding is that the level of violence in any given quarter is highly sensitive to the location of domestic residents' physical capital at the end of the previous quarter implying that there is greater willingness to escalate violence when capital has been relocated abroad.

Antzoulatos and sampaniotis (2001) employed five measures of capital flight existing in the literature and using a general to specific modeling technique tried to find out what causes capital flight. Their sample included a panel of 17 Eastern European countries - Albania, Armenia, Belarus, Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Leetonia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Slovenia and Ukraine. Measures of capital flight adopted by the work include Hot Money I, Hot Money II, Errors and Omissions, World Bank Residual Method and the Claessens-Naude measure. The work focused on the 1990s where capital flight for the selected Eastern European countries ranged between 1% and 6%. The major puzzle for the duo is that at this same time, capital flight for the western neighbors of the selected European countries was consistently below 1%. The model incorporated inflation, nominal interest rate, international interest rate differential adjusted for exchange rate changes, the size of the external sector, government balance as a ratio of output, changes in the real exchange rate, foreign direct investment, the size of capital controls and a dummy for exchange rate regime. Some attempts were also made to incorporate some country specific effects like the political situation and the stage of reforms in each country. From the findings of the work, three factors seem to be uppermost in causing capital flight from their models – real exchange rate appreciation, inflation and budget deficits. Their findings were quite interesting as well. It was found that for all five measures of capital flight employed in their model, real exchange rate appreciation was significant suggesting that outright devaluation of an overvalued currency might be more appropriate for an overvalued currency. Inflation was significant for four out of the five measures of capital flight indicating that inflation tax, which a number of the countries in the sample adopted as a stopgap measure against budget deficits may actually backfire – or generally have negative impacts. Budget deficit on the other hand, was significant for three out of the five measures of capital flight.

[5] The *Intifada* refers to the uprisings of Palestinians in the territories outside Israeli 1948 borders against Israeli occupation of Gaza, the West Bank and surrounding settlements. The first *intifada* was in December 1987 while the second occurred towards the end of 2000 and consisted of strikes and public demonstrations, which invariably escalated leading to civil deaths.

A major work that aimed to extract the theoretical implications of volatility and risk on assets and capital is the work by Vayanos (2004). It is mainly a theoretical model that tried to evaluate the implications of alternative assumptions about the relationship of risk and volatility and asset values and pricing policies. The model proposes a dynamic equilibrium model of a multi-asset market with stochastic volatility and transaction costs, generating liquidity premia that are time-varying and increasing with volatility where times of high volatility are associated with several other phenomena in the context of financial crises. It considers a continuous-time, infinite-horizon economy with one riskless and multiple risky assets. The riskless rate is exogenous and constant over time. The risky assets' dividend processes are exogenous, and are characterized by a common volatility parameter which evolves according to a square-root process. The volatility parameter is the key state variable in the model. The risky assets differ in their liquidity, each of which is assumed to carry exogenous transaction cost, arising for reasons such as asymmetric information, market-maker inventory costs, search, etc. It is further assumed that transaction costs are constant over time. Thus, the time-varying liquidity premia arise not because of the transaction costs, but because of the investors' willingness to bear these costs. Another key assumption is that investors are fund managers, managing wealth on behalf of the individuals who own it. Managers receive an exogenous fee which depends on the amount of wealth under management. They are facing, however, the probability that the individuals investing in the fund might withdraw their wealth at any time. Withdrawals occur both for random reasons, and when a fund's performance falls below an exogenous threshold. Managers choose a risky-asset portfolio to maximize the expected utility they derive from their fee, taking into account the probability of withdrawals.

Given these assumptions, the work shows that during volatile times, investors' effective risk aversion increases. Thus, there is a flight to quality, in the sense that the risk premium investors require per unit of volatility increases. Under these circumstances, the author shows that assets become more negatively correlated with volatility, and can also become more correlated with each other, with illiquid assets becoming riskier. A major implication of the model is that one cost of illiquidity is to make an asset riskier, and more sensitive to volatility. Under this circumstance unconditional capital and asset pricing model (CAPM) can understate the risk of illiquid assets because of such risk's time-varying nature: illiquid assets become riskier in volatile times, when investors are the most risk averse – with implications for evaluating the performance of strategies for investing in illiquid assets. While the work is not specifically set to investigate capital flight as a phenomenon or even its determinants, its premise and key findings cohere with those of core capital flight works in the sense that whether it

be the price or location of assets, there is a negative relationship between risk and volatility on the one hand, and capital performance on the other.

Table 2.1: Major Capital Flight Studies on Sub-Saharan Africa and Explanatory Variables Used

Authors	Sample & method	Capital flow	Macroeconomic environment	Fiscal policy	Risk and returns to investments	Financial depth	Political and governance factors
1.Hermes and Lensink (1992)	6.SSA countries,1976-1987: pooled data analysis	Debt flows(+)	Growth(0); inflation(0)	Budget surplus(0); tax/GDP (0)	Interest rate differential (0); exchange rate overvaluation (+)		
2.Murinde, Hermes, and Lensink(1996)	6. SSA countries, 1976-1991: time-series analysis	Debt flows (+/0); grants (+/-/0)	Growth (+/0/-); inflation		Interest rate differential (0); exchange rate overvaluation (+/0)		
3.Lensink,Hermes, and Murinde(1998)	9.SSA countries, 1970-1991: pooled data	Debt flows(+)	Inflation (+); lagged capital stock (-)		Deposit rate(-); expected change in exchange rate(+)	Lagged demand deposits (-)	
4. Olopoenia(2000)	Uganda,1971-1994		Growth (0); inflation(+)		Parallel market premium (0);		
5. Nyoni (2000)	Tanzania, 1973-1992:regressions in	Debt flows (0); past	Growth differential		Parallel market premium(0);		Political shock dummy(0)

	first differences	capital flight(-)	(-): inflation(0)		nterest rate differential (0)		
6.Ng'eno(2000)	Kenya, quarterly data 1981-1995		Real GDP(+)		nterest rate differential(-): exchange rate (+/0)		
Studies on other countries (some samples including SSA countries)							
7.Cuddington(1987)	7 Latin American countries.1974-1984: Time series analysis	Debt flows(+/0)	Inflation(+/0)	)	Real exchange rate(+):US interes rate(+/)		
8.Dooley(1988)	5 Latin American countries + Philippines. 1976-1983: pooled data		Inflation(+)		Financial repression(+); risk premium on external debt (-)		
9.Pastor (1990)	8 Latin American countries, 1973-1986:pooled data	Debt flows (+)	Growth differential(-): inflation(+/0)	Change in tax/GDP (0)	Interest rate differential(+): exchange rate overvaluation (+)		
10.Mikkelsen(1999)	22 developing	Debt flows	Growth(-		Expected		

	countries, 1978-1985: pooled data + time-series analysis for Mexico	(+); past capital flight(+)			relative returns on foreign vs domestic assets		
11. Anthony and Hollet (1992	4 Latin American countries + Philippines, 1976-1988: time-series analysis		Inflation (+/0)	Budget surplus(-/0)	Interest rate(-/0); exchange rate(+/0) return s on foreign assets (+/0)		
12. Boyce (1992; 1993)	Philippines, 1952-1986	Debt flows (+); past capital flight(0)	Growth(0)	Budget surplus(-)	Interest rate differential (+)		
13. Vos (1992)	Philippines, 1972-1988	Debt flows (+); debt stock (0); past capital flight(+)	Inflation (0)	Tax/GDP (0)	Interest rate differential (+); exchange rate undervaluation(-)		
14. Henry (1996)	Barbados, Jamaica, and Trinidad, 1971-1987: time-series	Debt flows (+)	Growth (-/0); inflation (-/0)	Budget surplus (-/0)	Interest rate differential (+); exchange (-/0)		

	analysis					
15. Hermes and Lensink (2000)	84 developing countries, 1971-1991: cross-section analysis	Bank lending(+/0): foreign aid (+)		Policy uncertainty: government consumption (+) tax (+); deficit (+) interest rate(+); inflation (0)		Political instability
16.Lensink, Hermes and Murinde 2000)	84 developing countries, 1971-1991: cross-section analysis	Bank and trade-related lending (+); aid (+); FDI (0)				Political instability (+); democracy and political freedon (-); war (+)
17. Collier, Hoefler, and Pattillo (2000)	50 countries (including sub-set of 22 SSA countries) 1980-1990; cross-section analysis	Debt stock (squared) (+)	Capital stock (+/0)	Dollar distortion index (squared)(+); investor risk (residuals) (0)	M2/GDP(0)	Governance indicators (0)

Source: Ndikumana and Boyce, 2002; Author's Reviews

2.3 Some Stylized Facts on Capital Flight

Some empirical regularity (stylized facts) emerges from the theoretical and empirical literature that has been surveyed in the foregoing section and from the experiences of several developing and emerging market economies. Underneath, an attempt is made to summarize these.

a. Definition and Measurement

There are as yet slight variations in the definition and measurement of capital flight. Several measures of capital flight therefore exist in the literature yielding (sometimes slightly differing) outcomes. However, there seems to be some agreement in the fact that capital flight is an abnormal movement of capital arising from the desire to place capital beyond certain asymmetric risks; as differing from the desire to increase the returns accruable to capital. This has yielded at least three different measures of capital flight with variants – the Residual Method (World Bank 1985 and Morgan Guaranty 1986); the Hot Money Method (Cuddington, 1986; Gibson and Tsakalotos, 1993); and the Dooley Method (Dooley, 1986).

b. Empirical Determination

There are also some variations in the literature in terms of the determinants of capital flight. However some of the major determinants that seem to have remained consistent in very many of published works can be classified into five main groups as follows:

- **Other forms of capital flows**

A consistent finding of the literature is that external borrowing and debt accumulation influence capital flight heavily, particularly in developing countries with weak institutions. This finding has been consistent over many forms of the specifications of the relationship between capital flight and debt; including alternative measures of the former. It has also been proven in both single country time series and cross sectional and pooled data studies and is robust in alternative econometric estimation techniques. This particularly suggests that capital flight in many developing countries is debt-fueled. However, the relationship has been found to be both ways as capital flight itself also influence debt accumulation as demonstrated in Boyce (1992, 1993) in a study of the Philippines. Some studies like Hermes and Lensink (2001) and Lensink, Hermes, and Murinde (2000) have investigated the role of other types of capital inflows like aid and private lending and found them to have positive effects on capital flight. Mikkelsen 1991 and Vos 1992 also found that capital flight exhibit some *hysteresis*

effect, but again this has to be read from a country-specific standpoint as Cuddington 1987; Boyce 1992; Nyoni 2000 found opposite effects.

- **The Macroeconomic Environment**

Two indicators of the macroeconomic environment – inflation and output growth rate – feature most prominently in many studies of capital flight. Inflation reduces the attractiveness of assets denominated in domestic currency and can also serve as an index of government 'losing control'. It has been found to positively affect capital flight and like in the case of other capital inflows, there is also a reverse impact as capital flight erodes the tax base leading to deficit financing through money creation. Equally. low economic growth has been found to positively impact on capital flight (Pastor 1990). Put more succinctly, the investigation often centres on the impact of economic growth differential between a country under study and its immediate competing regions (see Nyoni 2000 on Tanzania)

- **Risk and Returns to Investment**

Given postulations of the portfolio choice theory, several works have evaluated the impact of indicators of risk and returns as determinants of capital flight. Some of the indicators that have featured prominently include interest rate differential (domestic rate minus foreign rate), exchange rate gyrations, and survey-based measures of institutional investor risk perceptions. Many of the works (e.g. Dooley 1988) found that differential risk-adjusted returns are important determinants of capital flight. Dooley specifically noted that financial repression is a major factor working in favour of capital flight. Exchange rate overvaluation, leading to expectations of future depreciation, is a major factor in capital flight as it induces a shift in portfolio composition in favor of foreign assets (Cuddington 1986, 1987). Capital (and capital movement) is very sensitive to risk variables – exchange rate risks, political risks, return variations, costs and associated risks, etc. The specificities of definition of variables to include in any one of these risks are mainly country-specific though and may not easily be dissociated from the peculiar history of the country in question. A number of works also try to incorporate political and governance factors like instability and war while some others treat it as a different set of variables (see Felding 2003). Whatever the case, it has been accepted as one set of explanatory variables that should not be ignored, unless otherwise dictated by country specific empirical evidence.

c. Globalization and Capital Flight

As a result of international financial integration, capital flows increased sharply in volume during the 1990s for both industrial and developing countries. However, capital flight on the average, represent a higher proportion of GDP in developing countries than in industrial countries. The investment environment is gradually going global and the dismantling of barriers to capital movement increases the options to destinations of capital without prejudice to its source. Such increasing investment options and globalizing nature of investment environment makes it difficult to make country-specific recommendations on the management of capital flight without recourse to country-specific analysis.

d. Fiscal and Monetary Policies in Capital Flight Studies

In all this however, the level of attention paid to both fiscal and monetary policy variables as well as the level of financial development, is still scanty. Research on the impact of budget variations on capital flight in sub Saharan Africa is almost unavailable – the only major work in this area being Hermes and Lensink (1992), who could not establish evidence of significant link between fiscal deficits and capital flight. It was acknowledged by Ndinkumana and Boyce (2002) that this topic deserves further attention, given the chronic budget deficits that many sub-Saharan African countries have experienced. Not much has been done on the impact of taxation either which can affect capital flight in at least two ways – expected high tax rates imply lower expected net returns to domestic investment; and tax rate volatility implies higher risk and lower returns on investment. But then, the low amount of work on taxes is also understandable on account of the poor quality of data on taxation in most developing countries.

Monetary policies and their impact have also not been adequately examined nor has the role of financial intermediation, including the state of the capital market. In principle, financial development can reduce capital flight if accompanied by an expansion of opportunities for domestic portfolio diversification. However, financial deepening can also encourage capital flight if it facilitates international capital transfers. In particular, if financial markets are liberalized and international capital movements are deregulated, then domestic capital may be expected to flow abroad as long as risk-adjusted returns are higher elsewhere (see Ndinkumana and Boyce 2002; Lensink et al 1998).

2.4 Political Risk

Over time, firms have always strived, in their own interests to forge alliance with the state and even used such alliance with national powers to persuade risk-averse investors of the safety of their capital. This is in understanding of the powers of the state over the operations of firms and other entities within any economy. However, the literature on political risk, especially in relation to foreign investment, gained ground in the 1960s with nationalization where newly independent states overcame a number of threats (real and supposed) posed by operations of foreign firms by simply acquiring local subsidiaries of multinational companies (MNCs), spurred by Marxism. But then, even local firms have always had to battle political instability, workforce unrest, unstable macroeconomic environment and changing domestic policies in almost every economy. Thus, for many years now, several attempts have been made to explain the relationship between the dynamics of state life and the existence of private business. For multinationals, the trio of confiscation, nationalization and expropriation are just few other possibilities in the long list of factors militating against private ownership of the means of production vis-à-vis the sovereignty of the state.

Despite the widespread coverage of the issue, the literature continues to grapple with definition and classification of political risk. Most definitions agree that risk exists when there are discontinuities in the business environment arising from political change and such discontinuities are difficult to anticipate (Robock and Simmonds, 1973). In some of the literature, distinctions are made between transfer risks (potential restrictions on transfer of funds, products, technology and people), operational risks (uncertainty about policies, regulations, governmental administrative procedures which would hinder results and management of operations), and risks on control of capital (discrimination against foreign firms, expropriation, forced local shareholding, etc (Root, 1973). Clark (1991) concentrates on the non-diversifiable variations in a country's internal rate of return and the financial risk premium associated with a country's ability to generate the net foreign exchange necessary to meet interest and principal payments on outstanding foreign debt. There are other lines of not-too-fine distinction in the definitions as in that between global and specific political risks, macro and micro risks as well as soft and hard risks. There is the idea that the distinctions and the diversities in forms of risk confirm the fact of the presence of political risk in almost all forms of business endeavours with a wide range of sources (Clark and Tunaru 2000).

As the scope of political risk increased, so also did the literature attempt to quantify and clarify the mechanism for objective evaluation of investment climates. Rummel and Heenan (1978) was one of the first among this class of studies and the work proposes a method of converting polemical instability into probabilistic terms thus providing a scientific definition of political risk. This is closely followed by the Business Environment Risk Information Index (BERI), developed as a quantitative guide to political risk ratings. BERI reviews more than forty-five countries three times a year and is based mainly on the judgments and appreciations of a panel of outside experts which try to rank countries according to fifteen factors affecting business climate. Thereafter in 1979, the Political-Risk Services (PRS) evaluation system was developed and this has been extensively used by many multinationals. Subsequently, a new offshoot of the literature tried to evaluate political risk and integrate it into the decision-making process of an enterprise. Generally, the 1990s saw the scientific refinement of the political risk concept through the contributions of other fields of research such as political science, sociology, decision theory and psychology.

The magnitude, nature and direction of non-financial risks affecting businesses are uniquely dependent on the features of the businesses themselves. The latter vary widely and so do the interpretations of the potency and magnitude of the risks associated with them (Jensen, 2005). In a restrictive sense, the definition of political risk encompasses only political instability (activities originating from the activities of the state) and restricted to only unpredictable political events. A more inclusive definition however, takes in all kinds of politically-motivated acts of instability no matter where these are rooted – political or societal. Under this set of definitions there are fewer restrictions to what constitutes political risk. Even economic variables, in so far as they are related to monetary and fiscal policy, enter in the definition of political risk. In this latter group is the definition by Agmon (1985), who defines political risk as the unanticipated changes in political factors that affect the relative prices of traded factors of production, goods and services caused by the actions and reactions of governments and other political groups within and between countries. As a financial phenomenon, political risk includes unpredictable demands raised by the state or society on the assets, returns or cash available for shareholders from corporate investment. For Haendel (1979), it is the risk or probability of occurrence of some political events that will change the prospects for the profitability of a given investment. These definitions generally assume the

'essential state'[6] and view the activities of rent-seeking groups as contributing to a higher level of uncertainty in an economy and therefore a major source of political risk especially in developing countries

A major challenge of the empirical literature over time has been the measurement of political risk. Several of the available definitions do not yield to easy and immediate quantification. Several techniques, especially since 1990 have been developed to overcome this problem and scientifically assess political risk. A number of risk rating agencies have consequently emerged and the different data generated by their activities have fed into the massive research that has gone into the area lately. However, it must be noted that no matter the means adopted, measuring political risk will always involve some measure of subjective judgment. Particularly, the sources of risk are not very easy to measure and so would always task the ingenuity of the researcher in transforming them into measurable terms. In addition, the limit of the 'essential state' is a question for debate. Even for the neoclassicals, this is not clearly and unambiguously spelt out. In effect, while government actions could lead to instability, government inactions could also be very destabilizing. How these are to be equally treated remains a matter for empirical question.

Empirically, there have been attempts at measuring how important an understanding of country risk is for investors. Erb et al (1996) measure the economic content of five different measures of country risk: The International Country Risk Guide's political risk, the financial risk, economic risk and composite risk indices and Institutional Investor's country credit ratings. Through conducting trading simulations, they explore whether any of these measures contain information about future expected stock returns and thereafter linked these measures to future expected returns using time-series-cross-sectional analysis. They also analyze the linkages between fundamental attributes within each economy and the risk measures. The results show that the country risk measures are correlated with future equity returns and that the country risk measures are inter-correlated with one another. However, they noted that financial risk measures contain the most information about future equity returns. On their part, Busse and Hefeker (2005) explore the linkages between political risk, institutions and foreign direct investment inflows. Using different econometric techniques for a data sample of 83 developing countries for the years 1984 to 2003, they tried to identify those indicators

[6] The essential state is viewed in terms of the strict responsibilities of the state within a neo-classical definition

that matter most for the activities of multinational corporations. Of the 12 different indicators for political risk and institutions that they used, they found that government stability, the absence of internal conflict and ethnic tensions, basic democratic rights and ensuring law and order are highly significant determinants of foreign investment inflows – and one may add, ... and other forms of investment.

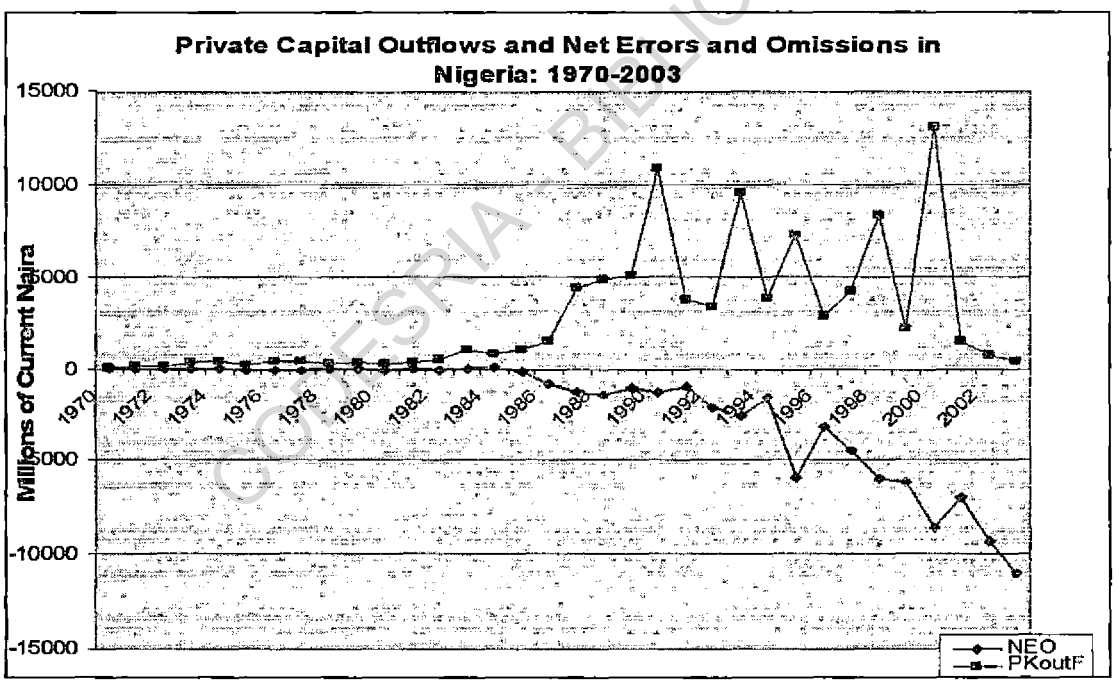
Some of the most contentious issues in the study of political risk and its relationship with businesses are succinctly captured by Kamga-Wafo (1998). The comment reproduced underneath comes from his study of the existing literature on the relationship between global investment and political risk.

One of the distinctive features of the rapidly growing Asian countries has been their basic political stability. By contrast, much of Africa has been torn apart by violent transfers of powers, colored by radical ideologies and tribal animosities. Latin America has also experienced struggles over socialist and communist ideologies; and Middle East remains embroiled in bloody conflicts over Israel and Islamic fundamentalism. During the postwar period, much of Asia emerged from a century of internal and external conflict into relative political stability; Japan in 1945, China after the final paroxysm of the cultural revolution in the 1970s, Indonesia once Suharto took control in the 1960s, Taiwan after the Kuomintang brutally established its control in the early 1950s; South Korea after the end of the Korean War and Thailand also at the end of the World War. Indeed, those parts of the region that have most suffered from war, violent repression and severe political instability including Vietnam, Cambodia, Burma and the Philippines have the weakest economic records. Furthermore many of the uncertainties in the economic future of Asia, Africa and East-Europe lie precisely in this realm of political stability or risk. For instance Yeltsin is now aging in a country without a clear succession process and no one can predict the political future of Yeltsin and in particular the post-Yeltsin period and the consequences on the investor confidence and perceptions of risk is unknown. Undoubtedly, political instability or stability has an influence on the perception of the risks by foreign investors. What remains to be demonstrated and assessed is the magnitude, the nature and the effects of the linkage between political risk and FDI. This demonstration is however because of the interrelation of psychological, political, social, economic and cultural factors in the realm of political risk concept very difficult to quantify. This explains partly why most empirical studies on the subject remain essentially descriptive.

2.5 Capital Flight and Political Risk in Nigeria

Capital flight studies in Nigeria are not divorced from the already mentioned problems of measurement. First, different definitions of capital flight yield different measures and magnitudes of the phenomenon. Secondly, even when only 'run-away funds' are to be captured as flight capital, they are not (and indeed cannot be) reported to authorities. So it is generally difficult to deduct capital that flees abnormal risks at home from total capital outflows. So measurement of capital flight in Nigeria has traditionally incorporated total resident capital outflows (see Onwioduokit 2002). The alternative that has also been widely adopted is to assume that since such funds are unrecorded, they could only appear on the net errors and omissions. The empirical section of this work shall evaluate trends in both so as to capture their relative strengths and weaknesses. The diagram below shows the trends in both aggregate capital outflow and net errors and omissions[7].

Figure 2.1: Private Capital Outflows and Net Errors and Omissions in Nigeria: 1970 – 2003



Source data obtained from CBN Annual Report and Statement of Accounts, Various Issues

[7] Actually, trade misinvoicing should be explicitly incorporated, but again, the assumption is that such sharp practices would reflect in the records in the form of errors and omissions.

Within the sample period, given whatever measure of instability that one may choose to adopt, Nigeria has been highly unstable. There are been 10 regimes and 9 changes in regimes, six of which were through coups, some violent and others non-violent. Recorded disputes stand at a total of 5, 742 with about 294.5 million man-days lost as a result. Even associated macroeconomic policy variables like monetary and fiscal instruments have also been unstable with even more unstable outcomes. Domestic inflation has remained in double digits for over two decades, while monetary policy targets were hardly ever met throughout the 1990s. Terms of trade shocks seem to have magnified the internal instability as oil price changes have literally been translated to domestic fluctuations as government spending gyrated with such changes. In fact, on many indicators of volatility and risk, Nigeria is considered to have performed even worse than developing countries' average. Whether such instability is in any way related to capital movements may be difficult to say at this point, that being one of the subject matters of interest in the present enquiry. However, anecdotal evidence through a correlation analysis seems to point to some relationship between net errors and omissions and disputes with a positive coefficient of 0.5.

Chapter Three

Methodology

3.1. The Analytical Model – A Risk Return Framework for Capital Movements

Shibuya (2001) presents a model of economic take-off and capital flight with free international capital flows, which aimed to explain capital movement under different stages of economic development. The choice is made of the model as the major theoretical framework because of its relatedness to the question of efficacy of polices for controlling capital flight. Besides, it is an improvement on earlier attempts at relating capital flight with domestic macroeconomic policies. In the model, the role of government is limited to facilitating the achievement of high capital equilibrium through policies that affect return and risk factors.

The model assumes an efficient global capital market from which also developing countries source capital, a portfolio mix of both risk-free assets and risky investments for international investors with a mix of optimal portfolio decisions and non-cooperative interactions that produce two stable Nash equilibria given different concentration of capital stock. In the early stages of development, investments are complementary and production exhibits increasing returns to scale. Investments reinforce one another and there are feedback effects among investment decisions which can increase aggregate profitability even if a single investment is not very profitable. The increasing returns to scale however has the seed of producing complementarity between the optimal portfolio decisions of international investors. It therefore produces two stable Nash equilibria – low and high capital equilibrium. Switches between two equilibria represent economic takeoff and capital flight. At the high capital equilibrium, interest rate parity with risk premium holds and international capital allocation is efficient. But at later stages of development, investments could be substitutable leading to decreasing returns to scale. Summarily therefore, the production function is twice continuously differentiable with respect to capital of the form:

$$F(k) = f(k) + \varepsilon k \qquad (1)$$

$f(0) = 0$, $F'(0) = 1$, $f'(k) > 1$ for $k = 0$ and $\tilde{\varepsilon} \sim N(E(\varepsilon), \sigma^2 \varepsilon$.

ε is a marginal productivity shock or a rate of return shock having a normal distribution and mean $E(\varepsilon)$; $f''(k) > 0$ for $k < \bar{k}$ and $f''(k) < 0$ for $k > \bar{k}$. $\bar{k}$ is the maximal level of the marginal product of capital. Thus the marginal productivity of capital (MPK) initially rises,

reaches a peak and thereafter declines forming an inverted-U growth pattern. The turning points coincide with the various stages confirmed by stylized facts of economic growth – take off and convergence (Agenor 2000; Romer 1996; Branson 1989; Stevenson et al 1988 among others).

Portfolio decisions of international investors[8] in the model are based on the risk-return tradeoff for all available investment opportunities and in all countries alike. The total wealth available to each investor is w. Asset portfolios consist of both risk free assets (with returns proxied by world interest rate R) and risky foreign investment (with returns r which depends on the marginal productivity shock, ε). Given efficient capital market, investors on risk-free assets are price takers, while returns on the risky foreign investment depend on actions of other investors

$$r = r(k) + \varepsilon \qquad (2)$$

Where r (k) = f' (k) – 1

The identified risks for international investors with returns r besides the productivity risk (associated with the productivity shock ε) include foreign exchange rate risk (normally distributed in the form d ~ N (E (d), Q^2d)).

Aggregate returns can therefore be represented as

$$\Pi = (1 + r(k) + \varepsilon - d)k_i + (1 + R)(w - k_i) \qquad (3)$$

л represents returns, d is the depreciation rate and w is total wealth, k is the share of that wealth invested in risky investments with returns r and R is world interest rate.

The resultant utility maximization problem is of the form

$$\text{Max } E(U(\Pi)) = -\exp\{-\beta[E(\Pi) - \tfrac{1}{2}\beta\sigma^2 - \Pi]\} \qquad (4)$$

$$\underset{k_i}{E}(u(л)) = -\exp\{-\beta[E(л) - \tfrac{1}{2}\beta\sigma^2 л \qquad (5)$$

In other words,

$$\underset{k_i}{Max}\ \Phi(k_i,k) = \{1 + r(k) + E(\varepsilon) - E(d)\}k_i + (1 + R)(w - k_i) - \tfrac{1}{2}\beta\sigma^2 k_i^2 \qquad (6)$$

Q^2 incorporates the variance of both depreciation and productivity risk as earlier expounded. First order condition for maximization is given by the optimal action k_i of investor i as a

[8] There are many identical investors not defined by the geographical bounds of the investors themselves but by the possible reach of their investment and thus includes those who may reside within the territory under consideration.

function of the average action of the other investors and the variance of the stochastic risk variables d and ε.

$$k_i = \frac{r(k) + E(\varepsilon) - E(d) - R}{\beta(\sigma^2\varepsilon + \sigma^2 d)} \qquad (7)$$

The second order condition for maximization is satisfied by the positive value of the denominator. k_i depends on the expected excess rate of return over the risk free assets discounted for the risk factors associated with investing in a foreign country[9] and is increasing with w.r.t. the numerator and decreasing w.r.t. the denominator.

Given the above, strategic complementarity and/or substitutability of the actions of different investors create the possibility of multiple equilibria. To explain; given that the model predicts increasing and/or decreasing returns, strategic complementarity implies herd behaviour from different investors while strategic substitutability implies stability of the investment environment. Defining strategic complementarity and substitutability in terms of the function Φ_{12} (ki, k), then strategic complementarity exists if Φ_{12} (ki, k) > 0 in which case investment by other investors increases the returns to investment by investor i and strategic substitutability exists if Φ_{12} (ki, k) < 0 in which case investment by other investors decrease the returns to investor i. Strategic complementarity, Φ_{12} (ki, k) > 0 exists only on the condition that the production function exhibits increasing returns to capital and this applies to a typical developing country, i.e. at early stages of development while strategic substitutability exists only on the condition that the production function exhibits decreasing returns to capital and applies to many countries at advanced stages of development.

From the above, it is evident that strategic complementarity implies instability in capital flows and has the tendency of producing multiple Nash equilibria. For two investors, i and j (for i =/ j), two pareto ranked stable Nash equilibria (k_{II} and k_{I}) and an unstable Nash equilibrium k_S can be identified. k_{II} is superior Nash equilibrium while k_I is the inferior Nash equilibrium. The pareto ranking follows from the relationship that

$$\Phi(k_{II}, k_{II}) - \Phi(k_{I}, k_{I}) = \tfrac{1}{2}\beta\sigma^2\{(k_{II})^2 - (k_{I})^2\} > 0 \qquad (8)$$

Intuitively, investors will prefer the pareto superior equilibrium. The unstable Nash equilibrium k_S is the threshold level of capital and is highly susceptible to perturbation owing

[9] For investors in risky developing country, the risk factor (the variance of the depreciation and productivity shock in developed country) is small and comfortably compares with the low returns expected from investments in those countries.

to small shocks on the economy. The whole idea of policy coordination, using fiscal and monetary policies/incentive (and of course sanctions) structure, becomes important under the scenario created above.

3.2 Two-Country Extension of the Framework

Underneath the Shibuya model is extended in two ways – by incorporating a two country framework and examining what changes it makes to the conclusions; and by treating political risk as a special kind of risk.

Comparative static analysis in the Shibuya model shows that changes in the risk and return factors (exchange rate, productivity and world interest rate) alter the relative intersection of the risk premium and excess returns curve. But considerations of the utility maximization actions of individual agents in a developing country, which precipitate capital flight, go beyond the mere linear assessment of the relative risk/return trajectory. The idea of multiple equilibria may imply the existence of a threshold risk level that triggers and/or sustains the instability associated with movement of capital away from a country. This is a question for further investigations though.

Let us assume that there are two countries – a typical developed country, m and a developing country, n. The model's major postulation is that capital flows to n will be positive for as long as the returns tempered by the risks for any investment in the country is greater than zero. For a typical developing country however, it probably takes more than just that to attract or retain capital.

Given the optimal investment condition expressed in equation 7 above,

$$k_i = \frac{r(k) + E(\varepsilon) - E(d) - R}{\beta(\sigma^2\varepsilon + \sigma^2 d)}$$

And the interest rate parity condition

$$\{r(k) + E(\varepsilon) - E(d)\} - R = \beta(\sigma^2\varepsilon + \sigma^2 d)k$$

The conditions for strategic complementarity and strategic substitutability remain that σ_{12} (ki, k) > 0 and σ_{12} (ki, k) < 0 respectively. Meanwhile, in a large number of developing countries $Q_{12} > 0$ while $\sigma_{12} < 0$ for the majority of developed countries. This implies that r'k > 0 in

developing countries and r'k < 0 in developed countries. Stating the relative risk-return nexus for both countries m and n respectively gives

$$k_{in} = \frac{r(k_n) + E(\varepsilon_n) - E(d_n) - R}{\beta(\sigma^2\varepsilon_n + \sigma^2 d_n)} = k_{im} = \frac{r(k_m) + E(\varepsilon_m) - E(d_m) - R}{\beta(\sigma^2\varepsilon_m + \sigma^2 d_m)} \qquad (9)$$

Interacting the terms gives

$$\beta(\sigma^2\varepsilon_m + \sigma^2 d_m) * r(k_n + E(\varepsilon_n) - E(d_n) - R = \beta(\sigma^2\varepsilon_n + \sigma^2 d_n) * r(k_m) + E(\varepsilon_m) - E(d_m) - R \quad (10)$$

The equation above simply says that the investment decision of the individual investor is based on the relative weight of the interaction between the risk in country m and the returns in country n vis-à-vis the risk in country n and the returns in country m. This relationship should not be viewed in a strict multiplicative sense; the intuition rather is that neither the risk nor the return in any one of the countries is considered independent of the risk and return in other countries. Of course, as in most other theoretical conceptions, this can be extended to near infinite number of countries. The relative risk-return conditions faced by the two countries can be presented schematically as follows:

Table 3.1: Relative Risk – Return Conditions Faced by the Two Countries in the Model

Description	Variance of risk factors	Return to investment	Productivity shock	Exchange rate shock	World interest rate
Odds against country m	β (σ^2 ε_m + $\sigma^2 d_m$)	r (k_n)	E (ε_n)	E (d_n)	R
Odds against country n	β (Q^2 ε_n + $\sigma^2 d_n$)	r (k_m)	E (ε_m)	E (d_m)	R

In the limiting case,

a. β (σ^2 ε_m + $\sigma^2 d_m$) = 0

b. r' (k_n) > 0; while r' (k_m) < 0;

c. E (ε_n), E (d_n), E (ε_m) and E (d_m) are also normalized to zero.

d. R = 1

e. β (σ^2 ε_n + $\sigma^2 d_n$) ~ ∞

Condition a owes to the highly stable and proactive fiscal and monetary policies in many developed countries, while the assumptions in b are projections of standard growth models

and as stated earlier in the text. Condition c is justified on the basis of the sweeping impact of globalization which has greatly reduced the geographical constraints to servicing the consumption needs of emerging markets, the speedy reduction in trade barriers among countries as well as the harmonization of laws guiding the use of production, trade and exchange rate incentives and measures across board. The term R on both sides is assumed exogenous to the policy environment of both m and n such that it does not add anything to the feasible range of options open to both countries. So the relationship becomes

$$\beta\left(\sigma^2\varepsilon_m + \sigma^2 d_m\right) * r(k_n) = \beta\left(\sigma^2\varepsilon_n + \sigma^2 d_n\right) * r(k_m) \qquad (11)$$

(0) >0 -∞ <0

Where r' $(k_n) > 0$ and r' $(k_m) < 0$

Four major groups of variables are left and the signs are as reflected under each group. The interaction between null risk of country m and the positive returns of country n literally renders the weight attachable to the positive returns nil. On the other hand, the interaction between almost infinite risk of country n with meager and diminishing returns of country m increases the appeal of the returns. Rational agents therefore faced with these options immediately prefer to forego the high returns and high risk of country n in favour of the low-returns but highly stable macroeconomic environment of country m. This tendency defines the behaviour of capital and partly explains capital flight.

3.3. Adding Political Risk

Here an attempt is made to introduce political risk and assume that it interacts with other risks in a manner that increases their potency thereby further weakening the capacity of corrective macroeconomic policies. It can impact directly on the return variables as when it reduces the rate of return to investment by increasing uncertainty while also reducing the size of the expectation coefficient on productivity shock. It also increases the variance of both productivity and exchange rate shocks. Having normalized exchange rate and productivity shocks to zero, and assuming that political risk (p) in the model does not affect the risk and return factors in country m, the overall impact on country n of changes in p could be summarized in the equation below:

$$\beta\left(\sigma^2\varepsilon_m + \sigma^2 d_m\right) * r(k_n) \Big/ \sigma^2 p_n = \beta\left(\sigma^2\varepsilon_n + \sigma^2 d_n\right) * r(k_m) \Big/ \sigma^2 p_m \qquad (12)$$

(0) >0 -∞ <0

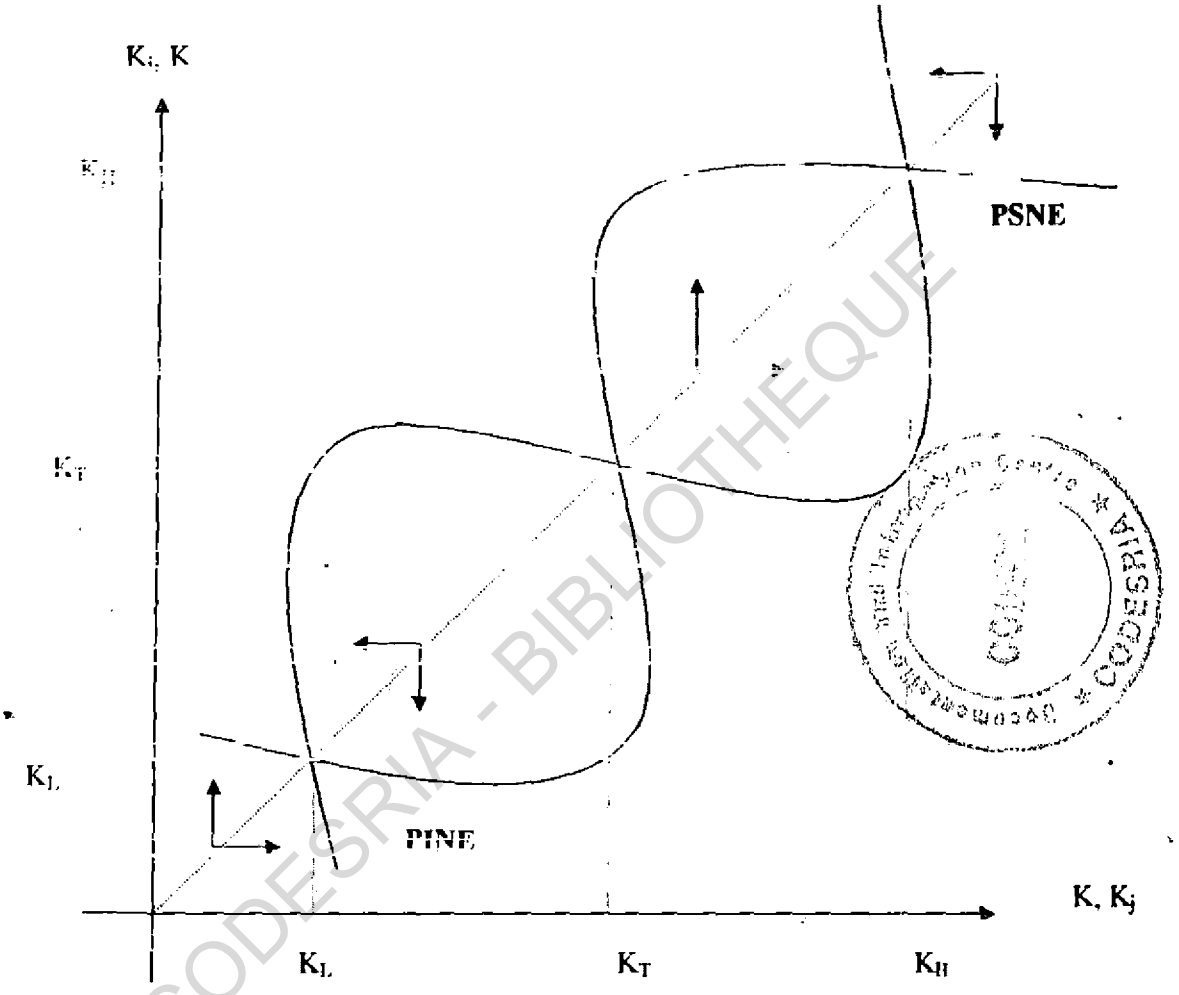
A major change in the equation above is in the return to country n, r (k_n) on the left hand side of the equation as the marginal productivity of capital in country n is further circumscribed by the variance of the political risk which acts as a reduction factor. It also appears on the right hand side where again, the size of the risk associated with investment in country n increases by the variance of political risk. Given earlier analysis, the coefficient of r' (k_n) is further reduced and approaches zero in the limiting case, while the coefficient of the risk for country n depicted by the variance of β (ε_n, d_n, p_n) approaches - ∞ even further. β ($Q^2 \varepsilon_m$ + $Q^2 d_m$) and r' (k_m) remain unchanged.

3.4. Equilibrium and Stability in the Models

The policy environment for the Shibuya (2001) model that provides the foundation for analysis in this work is the Asian development miracle and the financial crises. The typical developing country in the present context is one which is still at rudimentary levels of development, which has hardly gone through major levels of development, but which has experienced debilitating movement of capital away from its shores. Majority of countries in SSA fall into this group.

The motivation for capital flight could therefore differ significantly. In order to capture these, there is an attempt to evaluate the implications of capital flight through a re-definition of what constitute macroeconomic environment and factors affecting capital flight. In the Shibuya model, flight capital focuses more on international capital that found its way into the economy first and afterwards leaves when the environment is no longer conducive. The current analysis on the other hand, considers capital that originates from the developing country in question. Of course, general properties of capital (risk-aversion, volatility, etc) are largely similar, but the fact of such flight capital originating from the developing country in question makes the case for a more careful assessment of the relative impacts of risks and returns. The assumption of increasing and decreasing returns to capital as a major motivation to investment in developing countries has all the while been retained. It makes sense to assume that growth is positively related to political stability – and vice versa. As such, later stages of growth also 'coincide' with greater political stability. In the Shibuya model, the different stages of economic growth coincide with different levels of capital flight (the latter being a function of the relative risks and returns). Three distinct stages in the reaction function of investors could be deciphered as shown in figure 3.1 below.

Figure 3.1: Investors' Response Functions and Multiple Nash Equilibrium



Notes:

PSNE – Pareto Superior Nash Equilibrium

PINE – Pareto Inferior Nash Equilibrium

Conclusions on the implications of globalization on capital given the two scenarios differ slightly too. Uninhibited capital movement leads to the multiple Nash equilibrium in the previous model. But how does it affect the typical developing country in the present model.

The first is to note that only one major set of factors affect the movement of capital. With key macroeconomic variables normalized in their impact in the typical developing country and given that the returns to capital is continuously high up to some point E, only one variable (political stability) has an overriding impact in investment decisions (this closely follows from Dixit and Pyndick (1994). This is illustrated in figure 3.2.

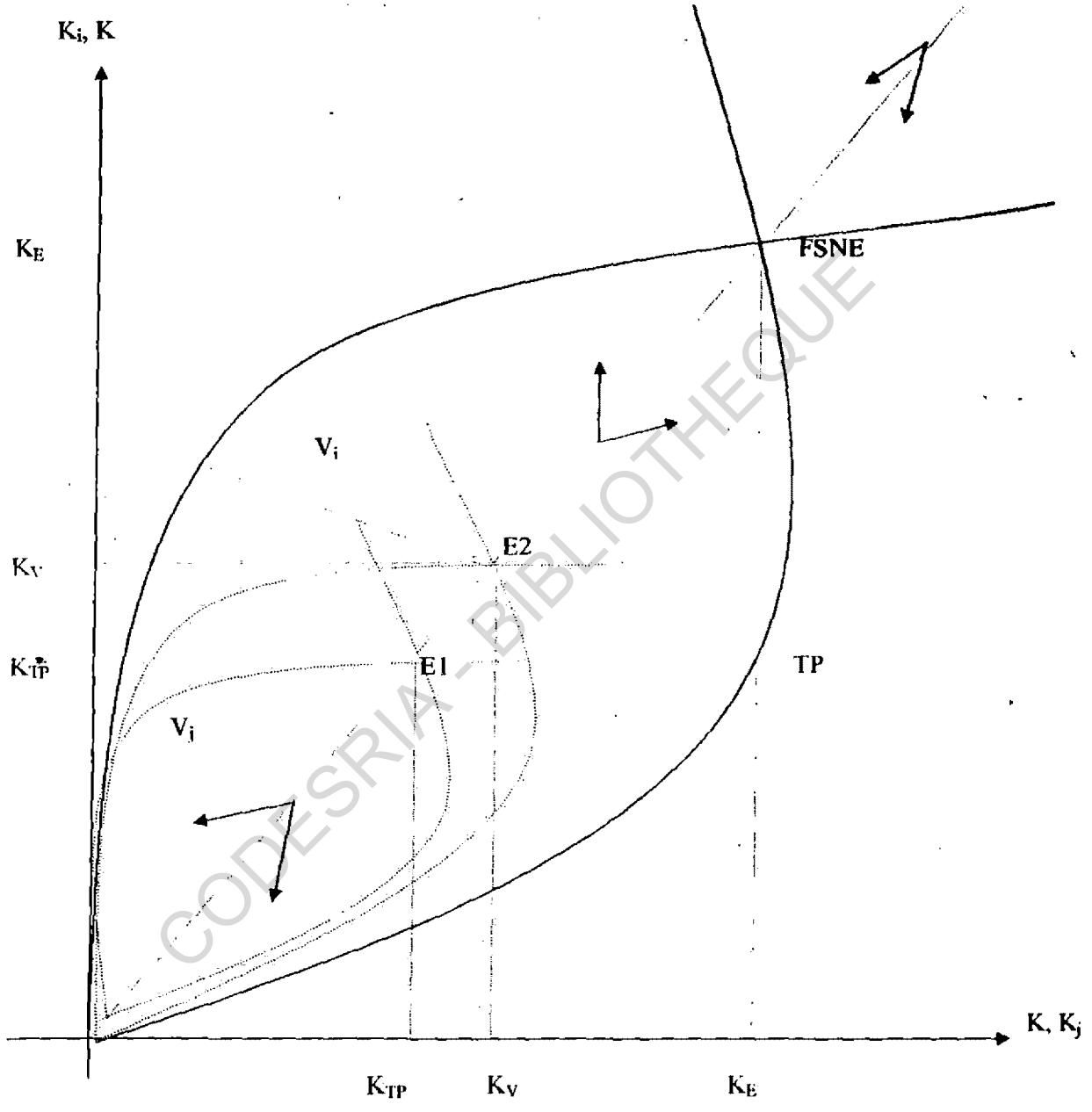
Possibility of multiple Nash equilibria given reaction function of investors still exists in the current analysis. The difference now is in the position of the initial equilibrium point. Political instability raises the point at which initial stability and equilibrium is achieved. Capital inflows are almost impossible in lower stages of development as the first Nash Equilibrium is given by the point, FSNE in the diagram. The point K_V underscores the possibility of differing perceptions of the level of risks to capital posed by the political situation in the country. At such points, there is a difference in investment levels and divergence in the share of capital that goes out of the country by each investor i and j. All other points of convergence are beyond FSNE as this marks the first period of political stability and therefore the first point at which returns to investment is perceived to match the risk. High returns below point FSNE are perceived to be heavily outweighed by the risks associated with instability. At this point, net capital outflow will always be positive.

The variable investment reaction represented by the triangle V_i, V_j TP indicates the perception of the different investors, Ki, Kj. Proper understanding of the reaction of the investors to the political situation will have to take into account the fact that in the main, the source of such investment finance is irregular. Most of such capital moving out of the economy comes from corruption or irregular activities. The investment perception of each investor therefore depends to a large extent on the investor's relationship with the government in power. The share of amassed wealth that would be left within the domestic investment environment will largely be determined by the investor's perception of risk which itself is determined by his access to decision making process at any point in time.

Beyond FSNE, the significance of political stability as a determinant of investment decisions becomes miniscule. High levels of economic welfare and growth induce capital movements mainly on economic terms and not political. The natural laws of risk (giving consideration to the usual macroeconomic variables of interest rate, exchange rate and productivity) and returns as expounded by Shibuya and other authors are fully back to work. Definitely, there

would be other equilibrium points but these are determined by other factors rather than the ones expounded here.

Figure 3.2: Political Instability and High First Stable Equilibrium



Notes

TP – Turning Point

FSNE – First Stable Nash Equilibrium

3.5 The Empirical Model

The model that follows is a multi-sectoral general equilibrium one for a single developing country – Nigeria. The policy context of this model is the National Economic Empowerment and Development Strategy (NEEDS) of the Federal Government of Nigeria (FGN 2004)[10]. Much of the changes in policy direction by government are aimed at facilitating growth and improving the investment environment. However, it remains to be evaluated to what extent the macroeconomic policy changes that are proposed by government will alter the incentive structure and lead to significant changes in the flow of resources. Again, as in many other economies, economic variables are interdependent and have feedback effects from both policy instruments to target variables and back to instruments. Thus, the realization of the objectives of the NEEDS will be highly circumscribed by the availability of resources. It has been projected that NEEDS will require approximately $12 billion dollars additional resources to be implemented. As such, the efficacy of policies in retaining or attracting resources into the economy will determine the extent of success of the reform programme.

The model that follows is a medium-sized open-economy model with a Mundell-Fleming framework. There is a conscious effort to incorporate specific (especially recent) developments in the Nigerian economy. The equations cover major aspects of the economy: production; absorption; Central Government Activities and monetary policy; domestic prices; and the external sector.

i. Production and Supply

Production

Aggregate output in the model will be given as the sum of both the oil and non-oil sectors as follows:

$$Y = Y^o + Y^n \qquad (13)$$

Historically, production in the oil sector is a function of the country's quota from OPEC which is divided between domestic consumption and exports. So output in the oil sector is given as

[10] NEEDS is the latest reform agenda of the Federal Government of Nigeria. Components of the agenda include the reining in of government through reducing access of the political structure to Central Bank financing of deficits, reducing the maximum size of deficits, strict organization and tracking of public expenditure through a medium term expenditure framework, growing the private sector and a social charter that commits government to poverty reduction and empowerment of private agents. Under NEEDS, real private consumption is expected to grow by 4.83% per annum, consistent with the broad objective of poverty reduction and reallocation of investible resources.

$$Y_t^o = Y_t^o(PQuota) \qquad (14)$$

Output as captured above is assumed exogenous and given by identity as the sum of domestically consumed and exported oil. Oil production is (pre) determined by production quota assigned by OPEC. It is further assumed that investment in the sector automatically adjusts in response to changes in the quota assigned to Nigeria[11]. Consequently, there is no need to specify independent production and investment functions in the sector. The sector is currently being liberalized. As such, it will be assumed that post-NEEDS domestic price of oil closely follows international price. Furthermore, there is no need to project two prices for oil (one for the local market and the other for the international market) in the specification of the oil output equation. So oil output is given by

$$Y^o = \{X^o + DOil - M^o)\} * OilP \qquad (15)$$

Where Xo is oil export, Mo is oil import, DOil is domestically consumed oil, and oilP is (average) oil price.

For the non-oil sector (Y-Y^o or simply Δy_n), a simple growth model with aggregate production function (f) relating non-oil output (y_n) to the capital stock (K) and the labour force (L) is adopted. Following Soludo (1996), capital is disaggregated into public and private capital stocks and includes raw materials imports (including oil imports) as factors of production. The non-oil production function therefore is given as

$$Y = Y\ (PK, GK, L, RM) \qquad (16)$$

Where PK is private capital, GK is public capital, L is labour and RM is raw materials imports. Expressing the output function above in growth rates gives

$$dy^n/y^n = f_{PK} \cdot dPK/y^n + f_{GK} \cdot dGK/y^n + (f_L \cdot 1/y_n) dL/L + (f_{RM} \cdot RM/y_n) \cdot dRM/RM \qquad (17)$$

dPK and dGK above are the rates of gross real investment in both the private and public sectors respectively which can otherwise be represented with *IRp* (for the private sector) and

[11]More than 80% of FDI into Nigeria goes into the oil sector and local capital content of the sector is quite small. Consequently, the sector is hardly subject to the sort of excruciating capital constraints facing the non-oil private sector. Labour absorption in the sector, on the other hand, is a miniscule proportion of total labour supply in the economy. Generally therefore, both the optimization and production functions of the sector can safely be assumed exogenous and not following standard specifications.

IRg for the public sectors respectively[12]. A log-linear approximation to the equation above would render the capacity output growth equation as:

$$\Delta \log Y^n_t = \alpha \log\left(IR_G/Y\right)_t + \beta \log\left(IR_P/Y\right)_t + \gamma \Delta \log\left(RM/Y\right)_t \quad (18)$$

Where $\alpha = f(Gk); \beta = f(Pk); \gamma = f_L.L/y; \delta = f(RM); \alpha + \beta + \gamma + \delta = 1$

Thus, total capacity output is given as

$Y_{CAP} = Y^o + (Y^n - RMM)$ (19)

Where Y_{CAP} is total capacity output, Y^o and Y^n are output in the oil and non-oil sectors while RMM is raw materials imports taken here as an intermediate input.

The equations are completed by specifying the determination of net factor payments (NFP) as follows:

$NFP = i^* (TDebt) + AMT + (TDebt - Tdebt_{t-1}) + NPFS$ (20)

Amortization AMT, interest payments on debt (i^*(TDebt), change in debt ($TDebt-Tdebt_{t-1}$) and payment on invisible services (NPFS) are defined in net value terms.

So Gross National Product (GNP) is given as

$GNP = C + I + G + (X-M) + i^* (TDebt) + AMT + (TDebt - Tdebt_{t-1}) + NPFS$ (21)

Where C, I, G, (X-M) all follow standard notations and the rest are as earlier defined.

Labour Demand

Given the rigidities and segregated nature of the Nigerian labour market, it is assumed that the demand for labour in the non-oil sector[13] is a function of output and the wage rate as follows.

$LD = \alpha RWG + \beta Y + \gamma LD_{t-1}$ (22)

Where LD is the demand for labour, RWG is real wage defined as nominal wage rate, W less inflation rate i.e.

$RWG = W - INF$ (23)

[12] While we treat IRg as exogenous, IRp is contextually important. As such, we endogenise private investment as responding to several risk factors and macroeconomic policy instruments. Flight capital is assumed to have private identity; in which case, it is a part of the stock of private capital. The implication here is that it has impact on gross private investment.

[13] We refrain from specifying labour demand in the oil sector given that the sector absorbs only a small proportion of total labour demand and the incentive structure in the market is not closely linked to that in the non-oil sector.

The incorporation of period t-1 labour demand takes care of structural non-market rigidities affecting the labour market.

Import Demand

Import demand is specified to be a function of output (demand) and two price variables, the real exchange rate (RER) as a relative price and tariff as an absolute price of imported inputs[14]. Import demand is specified as a function of output and domestic prices as follows

$$RM = \alpha GDPn_t + \beta RER + \delta Tariff + \gamma RMt\text{-}1 \quad (24)$$

Where RER is the real exchange rate defined as

$$RER = NER_{dj} * (\Sigma i\text{-}j \; P^*_{ij} . TW_{ij}) / P_{dj} \quad (25)$$

Where RER is the domestic real exchange rate, NER is the nominal exchange rate of the domestic currency vis-à-vis the currencies of the country's trading partners, and P^* is the price level of trading partners, P_d is the domestic price level, TW is the trade weight of the i_{th} country at period j with the domestic economy.

ii. Domestic Absorption

- **Private Consumption**

Standard consumption models treat consumption as the weighted average of consumption by constrained and unconstrained intertemporal optimizing agents within an economy (Soludo, 1996). So consumption is related to disposable income and wealth as follows

$$Ct = \alpha 0 + \beta Yd + \eta RW \quad (26)$$

Where Ct is consumption at current period, Yd is disposable income (i.e. total income less taxes and depreciation on capital) and RW is real wealth.

Private Investment Expenditures

The uncertainty and irreversibility model has quickly gained acceptance as a realistic representation of investment decisions (Dixit and Pindyck, 1994; Chen and Funke 2003; Alvarez and Stenbacka 2003, Zilberman 1999; Erdal 2003; Ingersol and Ross, 1992). As such, instead of merely modeling returns, the risk factors in investment are considered very important. Within this framework, the derivation of the movement of the risk factors like the

[14] The relationship between REER and tariff in the import demand function is a subject for continuous empirical debate. For an economy with a relatively overvalued exchange rate and highly variegated tariff regime, a widely held view is that the weight and impact of tariff will generally be clouded by the real exchange rate. In a different work (still in progress), we examine the nature of this relationship particularly for Nigeria. But while we wait for firm results on this, the intuitive approach is to specify import demand as a function of both REER and tariff – each representing a different set of price that affects imports.

real exchange rate, interest rate, political risk, among others follow a Brownian or Weiner process of the form

$di = (-i)\,dt + i\,dz + et$

Where i is the risk variable of interest

However, the approach shall be non-restrictive so as to give room for empirical validation within the model of the findings. This leads to the specification of a non-restrictive model of private investment as a function of volatility in the real exchange rate, interest rate, and political risk as follows

$$i = \alpha + \beta RER + \delta IR + \eta PR \qquad (27)$$

Where RER is the real exchange rate; IR is the interest rate; PR is a measure of political risk.

iii. Government Operations

This section attempts to capture government contribution to domestic output – revenue, expenditure, and other fiscal and monetary policies. However, given the structure of the Nigerian federation, it was not possible to capture the activities of the lower tiers of government. Indeed, this has its limitations as sub-national governments constitute about 50% of consolidated government activities. However, it also has its advantages in that the modeling concentrates only on the tier of government that has control over direct fiscal and monetary policies and instruments.

a. Government Revenue

Government revenue historically consists of oil and non-oil revenues. Oil revenue further consists of petroleum profits tax (PPT) and other oil related revenues.

$$OILTAX = PPT + OILRX \qquad (28)$$

Following Soludo (1996), petroleum profits tax is specified as a function of nominal oil exports and log-linearized as follows:

$$\Delta PPT = \alpha + \beta \Delta \log (OIL\ X * ExtDef) \qquad (29)$$

PPT is petroleum profits tax, OIL X is the nominal oil exports and ExtDef is an index of external sector deflator.

Other oil related revenues consisting of oil sales revenue/tax and the rents and royalties of the petroleum firms (OILRX) are presented as an identity reflecting the consumption of oil in the domestic economy (OilC) and the domestic price of oil(OilP)[15]. This is given as,

$$OILRX = OilC*OilP \quad (30)$$

Another major source of government revenue is imports tariff, yielding a sizable proportion of total government revenue. This is posited to be a function of total imports and average tariff rate.

$$TRev = c1*Tariff + c2*(M*ExtDefl) \quad (31)$$

TRev is total revenue from tariff and other import taxes, M is the imports value and ExtDefl is the external sector deflator.

Other income taxes are assumed to be a function of total domestic output and the tax rate as follows:

$$YTax = TRate* (GDP*CPIDefl) \quad (32)$$

Where CPIDefl is the domestic output deflator and TRate is the income tax rate, YTax is the income tax. Thus total government revenue is the sum of revenue from all four sources as follows

$$GRev = PPT + OILRX + TRev + YTax \quad (33)$$

b. Government Expenditure

Government expenditure will be discussed under the main headings of public debt service and public capital and consumption expenditures. Public debt is the sum of domestic and external debts. Domestic debt service payment is a function of total stock of domestic debt and the domestic interest rate as follows:

$$DDServ = i * DDebt \quad (34)$$

External debt is postulated to be a function of total government debt stock and the external debt service rate proxied by the London Inter-bank offer rate (LIBOR) such that

$$EDServ = LIBOR * EDebt \quad (35)$$

Where DDServ is the domestic debt service, DDebt is the domestic debt stock and i is the domestic interest rate proxied by the minimum rediscount rate. EDServ is the external debt service, LIBOR is the London Interbank Offer Rate and EDebt is the external debt stock[16].

[15] For convenience we will assume that this price is uniform nationwide and is fixed by government. However, the fact is that government is gradually pulling out of fixing domestic prices of oil consumption in its liberalization programme. This is still a contentious issue in the Nigerian economy and though the hand of liberalization is going steady, the impact of that on the data may yet come in the future.

For the rest of government expenditure, it is assumed that government will constrain itself by the WAMZ protocol to which it is signatory and to the medium term expenditure framework with both providing the levels of allowable deficits. Thus, both capital and recurrent expenditures are subject to the deficit financing constraints as follows:

$$CExp = CExp\ (WAMZ) \quad (36)$$

$$RExp = RExp\ (WAMZ) \quad (37)$$

Where CExp and RExp are capital and recurrent expenditures respectively and WAMZ is the West African Monetary Zone provision of no more than 12.5% of previous period deficit for current year financing.

c. Inter-temporal Fiscal Constraint and Closure Rule

Given small and almost inelastic domestic non-oil tax base, there exists little room for instituting a closure rule by assuming significant changes in the tax structure (as is the case with Soludo, 1996) Experience has rather shown that government expenditure and debt are often externally constrained. Such external constraint considers the trajectory for debt, interest rate and growth summarized in the relation

$$\Delta\ dt+1 = dt * (r - g)/(1 + g) \quad (38)$$

Further debt accumulation and lending are considered unsustainable when growth rate (g) is lower than interest rate (r).

iv. Monetary Policy

a. Monetary policy Reaction Function

Monetary policy has historically followed a base money targeting framework (see CBN 2002) assuming a stable money demand function of the form:

$$M_t = P_t + kY_t - \eta i_t + v_t \quad (39)$$

Where M_t is the money supply, Y_t is aggregate income, i_t is the interest rate, P_t is the price level, and v_t is a white noise error term. Re-writing the equation to endogenize interest rate

[16] It is assumed that the bulk of public debt is owed the Central and Commercial banks at concessionary rates. In the same vein, Nigeria has not followed any systematic strategy in amortization of its external debts. As such, it may not be helpful to specify equations tracking amortization of debt.

and normalize base money impact on interest rate to unity, the policy interest rate is specified to react to domestic price level, output, reserves and the exchange rate[17].

$$i_t = P_t/n - M_t/n + \frac{k}{n}(Y_t) + \alpha PREM + \beta \log\left(RES_t/RES^*_t\right) - (\text{int}\, diff_t) + \gamma \Re_t + \mu_t \qquad (40)$$

Where PREM is the premium in the parallel market for exchange rate defined as $PREM_t = \left[\left\{(off_e - par_e)/par_e\right\} * 100\right]$ and $\text{int}\, diff_t = Lendr - depr$, i_t is the policy interest rate (in this case the minimum rediscount rate – MRR). P_t is the price level. M_t is broad money supply, $PREM_t$ is the premium of the parallel market exchange rate, RES_t is foreign exchange reserves, int $diff_t$ is interest rate differentials defined in this case as the difference between average lending (lendr) and average deposit rates (depr) each at time t within chosen frequency.

b. Money Supply

The traditional identity of money supply as the sum of the banking system's balance sheet in the form of domestic credit and international reserves holds i.e.

$$Mt = DC + Res \qquad (41)$$

Where DC is domestic Credit and Res is Reserves. Domestic credit however is further divided between private and public credit. Change in credit to government comes from either the domestic banking sector (given weak capital market) or borrowing from aborad i.e.

$$\Delta DCGt = Gt - Tt - \Delta FIGt \qquad (42)$$

While change in private credit ($\Delta DCPt$) is made a function of output growth i.e.

$$\Delta DCPt = \alpha 0 + \alpha 1 \Delta Yt \qquad (43)$$

c. Money Demand

[17] Prior estimations of the impact of exchange rate both in pass through and reaction function show that the parallel market exchange rate is the more useful indicator of the effects of changes in exchange rate on other macroeconomic variables (see Agu et al 2003 for example). While output growth is one of the broad targets, instrument variation with respect to output is not well defined and so it is considered more practicable to target credit growth and leave output as an implicit target. For reserves, the WAMZ protocol which gives a minimum of six months imports cover and to which Nigeria is signatory will be of relevance.

Following neoclassical conventions, real money balances is related to income, interest rate and expected inflation in a log-linear relationship as follows:

$$\text{Log } (M/P) = a \log(Y) + b\pi \qquad (44)$$

Introducing interest rate and defining inflation in terms of expectation (adaptive expectations consistent with earlier specifications), the money demand function is expressed as a standard demand for money equation relating the desired stock of real money balances (m^d) to real income (y), the rate of interest on deposits (r), and the expected rate of inflation π^e (see Mallick, 1997) as follows;

$$Mdt = \alpha Yt - \beta rt - \delta \pi^e t \qquad (45)$$

v. Domestic Prices

a. Inflation

Exchange rate[18] changes affect domestic prices in two main ways – a direct channel which runs through the price of imports and an indirect channel which runs through domestic wage and other production cost structures (see Hufner and Schroder 2002: 2; Hampton 2001: 2; Goldberg and Knetter 1997). Given its open structure, other domestic and foreign prices also affect the domestic level such that it can be safely assumed that uncovered interest parity relationship holds. Given the size and structure of government, fiscal policy stance, without adequate intervention from monetary policy quickly translates to changes in price level. Credibility of monetary authorities is fast gaining relevance as a major determinant of the direction and pace of inflation. This last could be incorporated using a measure of expected inflation, in this case following adaptive principles as earlier expounded. Change in price level therefore is given by:

$$LnP_t = \alpha + \delta \ln nop - \gamma \ln NERP_t + \eta\left(GEXP/GDP\right)_t + \beta \ln M_{2t} + \lambda \ln_{t1} \Delta P_t \qquad (46)$$

γ, η, β, ρ and $\lambda > 0$ while $\delta < 0$

nop is non-oil production, NERP is the parallel market exchange rate, GEXP/GDP is the ratio of government expenditure to GDP and M2 is broad money supply.

b. Wage Determination

[18] The parallel market for exchange has become the de factor market for exchange rate. Most end users of foreign exchange are inclined to pay the access premium for foreign exchange at the parallel market than go through the rigours of obtaining foreign exchange at the official market.

The determination of wages in the present work pays more attention to the non-traded sector[19]. Proxying the non-traded goods sector with non-oil output and given the production function expressed earlier, real wage is therefore expressed as a function of labour demand in the non-traded sector. Meanwhile, labour demand in the non-tradables sector will be assumed to reflect in total capacity utilization, so that the wage determination function is given as

$$\Delta RW = \Delta W - \Delta P_N = \alpha 0 \Delta CU - \Delta \beta P_N \quad (47)$$

Plausible assumptions, however, have to be made about changes in the price level and the implicit formation of expectation for the wage bargaining adopting an adaptive process as follows[20].

$$\Delta RW = \Delta W - \Delta P_N = \alpha 0 \Delta CU - \beta \Delta P_{N=1} \quad (48)$$

Where domestic absorption inflation $\Delta P_{N=1}$ is given as the weighted average of output and imported inflation.

c. Stock Prices

Given both its age and size, the testable form of the standard random walk model is adopted to capture the behaviour of the Nigerian stock market as follows:

$$\Delta R_t = \sum_{i=1}^{N} a_{t-1} \Delta R_{t-1} + e_t \quad (49)$$

Where Rt is the stock return at time t; et is a sequence of an independent and identically distributed random variable. The testable form of the random walk hypothesis is of the form:

$$\Delta Rt = \sum N_i \; i=1 \; at\text{-}1 \Delta Rt\text{-}1 + et$$

Intuitively, the random walk efficiency hypothesis implies that macroeconomic fundamentals matter but it is a different issue determining which of these fundamentals that matter. Empirical evidence varies widely in this aspect.

vi. The External Sector

a. Exports

Nigerian export typically falls into two categories; oil exports which constitute the bulk of exports, and non-oil exports, which though relatively small, are the focus of policies. Oil

[19] The traded sector in Nigeria is basically the oil sector and total employment in the sector is just about 2%.

[20] While the modeling of expectation is an empirical issue, historical trends in Nigeria seem to indicate that agents make demands for wage increases with reference to impact of previous inflation rates on their real wage. Soludo 1996 used a mix of adaptive and rational expectations termed 'incomplete forward-looking' expectation. But we observe that the politics of wage setting has been that of reactionary wage bargaining especially in the public sector where agents tend to always bargain for wages in order to make up for 'erosion of real wages' by previous inflation rates. Indeed, the history of wage setting is such that given the employment situation and generally declining output, workers are 'shy' to make bold demands for increases in anticipation of future inflationary trends.

production is determined by the OPEC cartel and exports closely follow production as most of domestic consumption consists of imports. So underneath, the work proceeds to specify exports as a function of the quota as follows

$$OILX = \alpha + \beta\ (PQUOTA*POIL/NER)/ExtDefl \quad (50)$$

Where OILX is total oil exports, PQUOTA is the OPEC production quota, POIL is the international price of oil denominated in US dollars, NER is the nominal exchange rate and ExtDelf is the external sector deflator.

In the non-oil market, Nigeria is a typical price taker with a basket of primary and semi-processed commodities. These commodities are assumed to be the residual of domestic production over domestic consumption. So non-oil export is specified as follows:

$$NonoilX = \alpha + \beta \log GDP + \delta \log PX/NER \quad (51)$$

Total exports is the sum of oil and non-oil exports

$$TX = OilX + NonoilX \quad (52)$$

b. Capital Flows

For accounting purposes, total capital flows sum up short run and long run capital movements. But here a risk-return summary of capital flows is presented, where high risk premium raises the attractiveness of short run and highly convertible capital inflows while low risks acts otherwise. Assuming total capital outlay to be a zero sum game, the two components of capital movement may no longer be viewed as complementary but substitutionary. As such, both long run and short run capital flows will be modeled as exclusive and each depending on the nature and size of the international risk premium r. If relative risk premium is captured in the equations using volatility of the real exchange rate, the equation for both the short run and long run capital flows will be given as a function of growth of domestic output, monetary and fiscal policy variables as follows[21].

$$Kst = \alpha + \beta RERVOL + \delta GDP + \eta Def + \rho MS \quad (53)$$

$$Klt = \alpha + \beta RERVOL + \delta GDP + \eta Def + \rho MS \quad (54)$$

And total capital flows is the (zero) sum (game) of short term and long term capital flows i.e.

$$Kt = Kst^{r} + Klt^{1-r} \quad (55)$$

[21] A potentially interesting aspect of enquiry into the possible crowding out relationship between long run and short run capital will be the growth of financial instruments and market relative to real sector activities. The current study however, will not delve into this.

Where Kst and Klt are short term and long term capital movements respectively, RERVOL is real exchange rate volatility, a measure of policy deviations; Def is Central Government Fiscal Deficits and MS is money supply (the last two capturing monetary and fiscal policy stance)

Finally, an attempt is made to incorporate 'net errors and omissions' as a function of basic fiscal and monetary policy variables. No doubt, standard capital account equations would reflect the interactions between capital and policy instruments. But an explicit capital flight equation would complement whatever information that could be obtained from the estimates obtained from standard capital account interactions with monetary and fiscal policy variables. Given the scenario then, net errors and omissions is made a function of volatility, output, government expenditure (proxying fiscal policy stance) and the minimum rediscount rate (proxying monetary policy stance). The equation is given as

$$Neo = Neo (RERVOL, Y, GEXP, MRR) \quad (56)$$

3.6 Data Sources and Estimation Technique

Much of the data for this work came from several sources as no single agency is known to have a databank that covers the many data requirements of the work. Central Bank of Nigeria publications like the Statistical Bulletin (various issues), the Annual Report and Statement of Account (various issues) and other CBN publications were extensively consulted and data from them compared and used. The Annual Abstract of Statistics of the National Bureau of Statistics was also used. For some of the data that could not be obtained from these sources, the World Economic Outlook databank was used to supplement. Data from other sources like the International Trade Statistics of the World Trade Organization, the UNCTAD Trade Review were extensively reviewed and compared to ensure consistency in the numbers. For estimation, the E-Views econometric software was used. Further analyses were also done with regular spreadsheets like Excel and SPSS.

Chapter Four

Empirical Results

4.1 Introduction

This section attempts to summarize implications of the estimates and projections obtained by estimating the empirical model specified in chapter IV above. The empirical estimation used adopts an iterative Gauss-Seidel, which works by evaluating each equation in the order that it appears in the model, and uses the new value of the left-hand variable in an equation as the value of that variable when it appears in any later equation. This algorithm is therefore dependent on the order of the equations in the model. A major requirement for this process therefore is that all equations be specified in behavioural terms. Identities either have to be converted to behavioural equations or entirely left out of the equations.

The challenge of data gathering, conversions (where necessary and appropriate) and usage is one of the biggest challenges that was faced in the course of this work. The challenge was summarized by Soludo (1996) when he compared the state of data in developing countries to the state of roads. Both are highly underdeveloped and bumpy, irregular and sometimes not appropriate for the vehicles that ride on them. But this leaves a modeler with two options -- leave out modeling until the data situation significantly improves, or make the best use of what is available. The work chose the latter option. But this necessitated quite some smoothening of the data from what they were or inputting (carefully constructed trend) estimates on aspects of the data that were unavailable. The points below summarize some data smoothening procedures undertaken in the work

- GDP Growth for 1970 was obtained as the average of growth for 1971 and 1972
- Manufacturing value added for 1970 was obtained using the ratio of GDP for 1970 and 1978 and the MVA for 1978 and 1970
- Manufacturing value added for the rest of the years 1971 – 1977 were obtained by assuming same growth rate in manufacturing as in overall GDP (explains the constant MVA ratio for those years)
- Manufacturing capital imports for 2001 – 2003 proxied by imports of transport equipment for those years

- Manufacturing raw materials imports for 2001 – 2003 obtained by adding imports of Crude materials inedibles, mineral fuels, animal and vegetable oils and fats and chemicals for those years
- Gross Fixed Capital Formation for 1970 was obtained using ratio of capital formation to nominal output for 1975
- Gross fixed capital formation for 1971 – 1974 obtained by using relative growth rates of nominal outputs for corresponding years
- Exports (and imports) to GDP ratio obtained using GDP at current market prices
- Real effective exchange rate 2003 data derived by a moving average of the two preceding years
- Manufacturing capital utilization - Data for 1970 to 1975 obtained by three year moving averages
- National Savings Figures for 1970-1974 obtained same way as Gross fixed capital formation
- Trade Disputes and Man-days lost – 2 year moving average was used to obtain 2003 figures for trade disputes and man-days lost.
- Terms of trade for 2001-2003 derived from three year moving averages
- Average oil price for 1970 - 1978 derived by ratios of TOT for same years with TOT for 1979 (the first year for which data is available for oil price)
- Private Consumption and Government Consumption data for 1970 to 1974 obtained by ratios of GDP at current factor cost for the unavailable years to 1975 (the first available data year)
- External Sector Deflator obtained by cross multiplying the REER with GDP deflator

It was not possible on account of space to include the full spreadsheet containing the correlation coefficients of all the variables in the databank. But hereunder an attempt is made to briefly describe the data. The nominal values of such variables as CPI, domestic debt, external finance, exchange rate and current GDP had fairly high correlation with one another and with fiscal balance, government expenditure/revenue and gross consumption. The first possible cause could be the impact of nominal monetary variables and inflation on these. So

an attempt was made to transform the variables into real terms, where applicable. Three deflators were used –the GDP deflator, the CPI deflator and the external sector deflator[22].

For socio-political instability, five variables were experimented with. The first is coup d'etat, a dummy indicating years of forced (military) government changes in the country (whether violent or not). Regime change is another dummy showing years where there are changes in government. Such a change could be military or civilian. The years of such change are more numerous than the years of coup. Regime change is not constructed to include years like 2003 where though there is a change in government, it still involved the same set of political actors. As such, 1999 to 2003 is still considered same regime. Real exchange rate volatility is a more standardized measure, capturing the deviation of the real exchange rate from its mean value. The value is calculated from available real exchange rate values obtained from Central Bank of Nigeria databank. Output variability on the other hand is calculated as the absolute deviation of annual GDP value from its trend. To obtain the trend, a trend equation is estimated and annual values of trend GDP estimated. Output variability was now obtained as the deviation of each year's GDP from these annual trend values. The fifth variable is the man-days lost on account of political and industrial disputes. This variable multiplies the number of days and the number of men involved in the disputes to obtain the man-days lost. In majority of the estimations, all five measures of instability were all put into an equation together. This is the general-to-specific estimation technique, where an iterative sieving process is used to eliminate the wrong explanatory variables.

4.2 Findings

As in most modeling efforts, several forms of the model were estimated involving various transformations of the data as well. For parsimony, the mix of linear and log-linear estimation was found most appropriate, in some cases, with minor modifications to the original specifications. Given the multiple interrelationships in the system, this analysis skips details of the working of the entire system and the interactions observed among the variables in the macro economy. Greater attention is rather paid to the variables of interest for the present

[22] Both the CPI and GDP deflators were fairly easy to calculate using already existing data. But given that the external deflator was not as explicit, it was obtained by interacting GDP deflator with the REER. Subsequent deflation of the core (numerator) variables thereafter depended on considerations of its classification - GDP deflator for real sector variables, the CPI for monetary variables and external sector deflator for external balance variables.

work and explanations offered on the rest as they relate to the basic relationships being explained.

One of the major confirmations of the model is the positive interaction between domestic real and monetary sectors with the external sector (especially the current account balance). Output in the oil sector is driven mainly by exports and local consumption (less imports) with a 1% change in the consumption and net exports leading to a 0.15% change in oil output. On the other hand, output in the non-oil sector is driven by shifts in imports of raw materials and combined public and private sector consumption. A percentage increase in raw materials imports lead to .13% increase in non-oil output; while a percentage change in private and public consumption respectively lead to .29% and .16% change in total non-oil output respectively. Output (measured by GDP), import taxes (represented by implicit tariff) and economy wide relative price (the real exchange rate) determine aggregate imports. While output favourably and significantly affects imports with a 1% change in output leading to a 1.3% change in imports, the real exchange rate and import taxes negatively affect imports. This means that imports in Nigeria have positive and highly significant income elasticity, while real exchange rate appreciation and higher import tariffs lead to reduction in imports. This largely confirms earlier works on this subject matter, even when a number of those previous works were done with partial equilibrium analyses. The idea of aggregate imports having ratchet effect was not confirmed by the output results. Gross consumption in turn is a function of output and gross domestic savings. True to theory, a percentage increase in output leads to a rise in consumption by almost .98% while savings is negatively related to consumption (indeed by definition as well). Higher lending rate discourages investment (capital formation) with 1% change in lending rate reducing investment by 0.05% while a doubling of real exchange rate volatility reduces investment by .2% though this is statistically much weaker than the impact of the lending rate and not significant at 5% level. Petroleum taxes as expected simply respond to total oil exports (even though relatively weakly at 5% level of significance[23]). while other oil taxes significantly depends on the proportion of total output that is consumed locally with almost a one-on-one correspondence. Government expenditure, on the other hand, is modeled to reflect ECOWAS protocol gross output and money supply. The ECOWAS requirement of not more than 12.5% of previous year's fiscal deficits predictably places an effective check on government expenditure even though the

[23] It might be probably helpful for future research to link oil taxes to total production instead of just exports as capturing other activities of oil firms might be a bit delicate and difficult to do

size is small[24]. Output and money supply positively affect government expenditure with 1% change in both respectively leading to .80% and .56% change in government expenditure. The monetary policy reaction function equation reflects impact of the parallel exchange rate, output, interest rate spread (between deposit and lending rates) and broad money supply, with each of these exacting significant impact. Parallel exchange rate appreciation increases pressure on the minimum rediscount rate by almost .1% for every unit percentage appreciation. Contraction of output also increases pressure on the cost of funds with a 1% implosion rate increasing minimum rediscount rate by almost 7% and vice versa. A unit expansion in money supply leads to a 2% increase in the rediscount rate. As there was no test of causality here, it may not be easy to prove that this is not a reverse direction as upping the MRR may be a means of curtailing negative impacts of expansionary money supply. Equally, higher interest rate differential is also associated with high policy interest rate and again this may be a reverse relationship. The relationship of domestic prices (inflation) and parallel exchange rate and government expenditure as a ratio of output is comparatively weak and insignificant at 5%. The biggest and most significant driver of inflation rather seems to be money supply with a 1% increase in money leading to 3% change in inflation. This seems consistent with historical movement of inflation and money supply. The closeness between average wage movements and capacity utilization in the manufacturing sector is comparatively weaker than that between wages and broad money supply. A percentage increase in broad money leads to .18% reduction in real wages. This is true to both theory and empirical findings especially as the wage structure in Nigeria exhibits a *hysteresis* effect (up to 0.6% for a one year lag) as confirmed by the present empirical results.

The adoption of the standard random walk hypothesis as done in modeling the stock market is a statement of a weak relationship between the stock market and real sector (and indeed other macroeconomic) fundamentals. Again it will be helpful to clarify that the actual nature of the stock market in Nigeria is still under study. However anecdotal evidence suggests that the thriving market of the 1980s and 1990s when the rest of the economy was comatose points more to a structural weakness between the real sector and share valuation. Thus, the consistency of the coefficients with the postulates of the random work thesis is not

[24] Much of the series fall under periods when this was not yet adopted and as such, the size of the impact is not as yet the major concern as much as its direction.

surprising[25], even though this is true only up to the first lag (.7% for a one period lag). Changes in oil export are determined by changes in oil production (2.3%), the terms of trade (.003%) and industrial disputes (-.16%) with each of these being very significant. Oil sector volatility manifests in increased hostility between oil firms and their host communities and contributes largely to mandays lost to disputes. For a long period within sample, for example, a number of the major oil producing firms lost significant output and export to disputes and other forms of socio-economic instability in the Niger Delta. Non oil exports on the other hand did not show much of the variations arising from disputes and other forms of volatility as oil exports. It is in any case very small in both absolute and relative terms, and depends mainly on output in the non-oil sector with a 1% increase in output increasing it by .6%. It was difficult to explain private capital inflow by any of the regular economic fundamentals. Even as a function of its own lag, it was significant only at 10% level. This owes to a number of reasons. Some aspects of the literature indicate that private capital inflow is not actually very responsive to much of the variables within regular policy circle. The suggestion for future studies may be to try modeling it as autonomous component of capital flow. Capital outflow on the other hand, is a positive function of two major indicators of macroeconomic distortions – real exchange rate volatility and output variability. For every unit increase in real exchange rate volatility, capital outflow increases by .009% and for every unit increase in output variability, it increases by .02%. Unit percentage increase in income increases capital outflow by almost 5%. However, while the impact of real exchange rate volatility is very significant, that of output variability is significant only at 10% level. Net errors and omissions (our indicator of capital flight in the model) are affected by real exchange rate volatility, as well as both fiscal (government expenditure) and monetary (minimum rediscount rate) policies. The impact of real exchange rate volatility on capital flight is again almost one-on-one and statistically very significant. Government expenditure and changes in the minimum rediscount rate, however seem to significantly curtail capital flight. Real exchange rate volatility displays a ratchet effect (.63% for one period lag). It is however also impacted upon by the dummy variable, coup (up to 70% of the time) and is in turn a reverse function of capital, the latter affecting it by almost .2% for every 1% change.

[25] We hope to survey further this literature, the data as well as alternative models in future specifications, incorporating other variables to better understand this relationship or propose modifications to it.

In the capital account, greater attention was paid to private capital flows (indeed public flows over the sample period could in some sense be considered exogenous)[26]. The model tried to capture all components of the account – private inflows and outflows and net errors and omissions (the latter standing in for capital flight and unrecorded flows) – independently. A number of instability indicators were severally used – real exchange rate volatility, number of man-days lost on account of social and industrial disputes and dummies for coup d'etat and changes in regimes. Changes in domestic capital formation (GFCF) are determined mainly by the lending rate and real exchange rate volatility. As noted earlier though, the impact of real exchange rate volatility was not as strong as that of the lending rate, but at least it showed stronger than most other instability indicators used in the modeling at one stage or the other. Private capital inflow clearly showed its independence of the regular variables, both standard macroeconomic determinants of investment and other instability indicators used in the modeling. Capital outflow on the other hand, depends largely on real output and two indicators of instability – real exchange rate volatility and output variability. Higher volatilities of both the real exchange rate and output translate to higher outflows of capital. This is the only place where the impact of output variability is felt and such impact is equally very weak. Unrecorded flows – the net errors and omissions – are dependent again on real exchange rate volatility, output and the duo of fiscal and monetary policies, represented by government expenditure and the minimum rediscount rate. However, it could not be confirmed that the same set of policy instruments affect real exchange rate volatility, which itself has been a major determinant of both domestic and external indicators of capital flows. From the estimation output then, it becomes clear that with the exception of capital inflows, which exhibit high policy independence, both legal private capital outflows and net errors and omissions are highly circumscribed by indicators of volatility. However, net errors and omissions seem to be much more highly sensitive to both monetary and fiscal policy instruments. Finally, an attempt was made to endogenize real exchange rate volatility within the model. This was not originally proposed in the theoretical model, but the idea is that there may be some information content of such an estimate that may be useful in explaining the whole gamut of relationships and interconnectivity among variables as outlined above. It was difficult to identify any systematic dependence of real exchange rate volatility on any one of

[26] For a highly indebted country like Nigeria, long years of positive current account balance have often been offset by negative capital account balance owing to the high net factor payments that are made. Such factor payments in many cases do not depend on output for any current year as they do on the proportion of total debt for which amortization is either due or remitted as well as the size of the interest payments made (some of the latter of which may have little or no relationship with either the origins of the debt or output but more with the nature of penalties attachable to the debt in question).

the established variables. Both monetary and fiscal policy variables were introduced into the model but in each case, they showed up inconsequential in determining volatility. Of course, the component of policy that was taken into consideration in the equation could only be that captured by data i.e. government fiscal balance and the minimum rediscount rate. The limitation to quantitative component of policy owes more to the fact that personal experience in modeling instability has shown that choosing a representation for political instability could be quite tricky and would largely depend on the context and issues under investigation. Four other measures of instability were introduced – two dummy variables representing coups and regime changes, GDP variability and man-days lost on account of disputes. The modeling shows that of all the indicators of socio-political instability, only coup seemed to have any significant impact on volatility. Interestingly though, capital flight in turn matters for volatility.

Incorporating the impact of risk on capital flight in the model involved at least three alternative approaches. The first of these is the estimation of a capital flight equation incorporating almost all the risk variables noted in section 5.2 above among other 'regular' explanatory variables. The second involved a two-way independent evaluation of private capital movement within the macro model to capture the varying factors that individually might account for capital flows. Yet the third approach involved modeling volatility itself as a function of some measures of fiscal and monetary policies, also among other variables. For the capital flight equation (the first approach), only real exchange rate volatility proved a significant variable in flight capital. One way to read this is that having captured much of macroeconomic and policy distortions, real exchange rate volatility 'crowds out' the rest of the measures of instability. Whatever the case though, it was highly significant, and none of the rest of the measures was significant. This direct estimation also showed both monetary policy (through the MRR) and fiscal policy (through government expenditure) as very significant factors in influencing capital flight. Some slight difference however emerges when this result is compared with the result from the real exchange rate volatility equation (approach number three). None of the monetary and fiscal policy instruments is significant in determining real exchange rate volatility, itself a major determinant of capital flight. The implication is that the channel of transmission which proposed in this work i.e. influencing capital flight through influencing real exchange rate volatility) using monetary and fiscal policies, does not hold and that monetary and fiscal policies have direct impacts in determining capital flight. Interestingly, capital flight in turn affects real exchange rate

volatility which makes for a loop. Breaking the chain of impact in this sort of relationship could be difficult given that volatility leads to capital flight and more capital flight engenders even more volatility. All the while, monetary and fiscal policies cannot affect the volatility.

For the two-way capital flows (inflow and outflow), policy and macroeconomic impact seems to rest more on capital outflows (reinforcing the results obtained on capital flight). Capital outflow was made a function of real exchange rate volatility, output and output variability. The implication again is that real exchange rate volatility is a key factor in determining outflow of capital from the economy. Put in other words, instability leads to high capital outflow from the economy. Contrary to specification in chapter four above, the estimations were unable to establish the same kind of relationship between private capital inflows on the one hand and key macroeconomic fundamentals (including instability) on the other. Private capital inflow outcomes do not seem to respond to changes in major macroeconomic fundamentals. Indeed, it was not even possible to establish significant temporal dependence of the inflows. The signal sent by estimated result is that historical data do not suggest that policies to attract capital into the economy work: it rather makes better sense to assume that capital inflows into the economy are exogenous to both policy and macroeconomic changes. This though is subject to future verification. Income changes also affect both regular (and recorded) capital outflows and capital flight. Increasing income increases the chances of leakage through capital flight as well as through recorded private capital outflow.

Chapter Five

Conclusions

5.1 Summary

Many studies on capital flight aim to evaluate its causes or relate the phenomenon to economic growth and other aspects of macroeconomic stability. Indeed, there is no paucity of empirical findings on either the causes or implications of capital flight; Onwuoduokit (2002), Ajayi (1992; 2002), Pastor (1990), among others made significant contributions in this respect. Their findings suggest a menu of possible causes ranging from balance of payments disequilibrium, real exchange rate misalignment to political risks and other socio-economic imbalances and distortions. The weight attachable to each determinant has however varied among studies and among economies studied and among methods used in such studies.

But there is the additional debate about the actual nature of the relationship between capital flight and monetary/fiscal policies. Conventional wisdom (embodied in Mundell-Fleming) suggests that higher capital mobility diminishes the effectiveness of fiscal policy, especially in an open economy with flexible exchange rate. Pierdzioch (2003) using a dynamic general equilibrium two-country macroeconomic model analyzes the consequences of international capital mobility for the effectiveness of fiscal policy. He showed that a higher degree of capital mobility can also increase the effectiveness of fiscal policy, especially if monetary policy stance can be described by a simple monetary policy rule. But the impact of high capital mobility on monetary and fiscal policies is just one part of the story, especially if the capital movement in question is the sort perceived as 'perverse flight'. Monetary policy is also argued to influence capital movement. Cline (1985) makes the point that developing countries can limit capital flight by adopting appropriate domestic policies on interest rates, the exchange rates, capital account convertibility, and fiscal balance. These conclusions have been based mainly on country-specific and context-specific empirical data and in many cases have also produced results that differ depending on the method employed in the data analysis, the nature and quality of data obtained and the country/group of countries under study.

One major gap seems to appear from the summary of studies on capital flight and economic growth – a systematic regularization of the knowledge obtained from these disparate and context-specific studies. Are there stylized facts about the relationship between capital flight and economic policies/growth especially for the set of developing countries where capital

flight seems to be pressing economic problems? How can such information and knowledge be serialized, etc? Building a theoretical relationship is not just important for academic research but also for policy purposes. The first part of the current work sets out with this objective. Using initial arguments from a model developed to analyze the relationship between capital flight and economic development, it was able to establish that capital flight does not just depend on the comparative risk and return from investment in any particular country, but also on the comparative status of both its risk and return relative to other countries at different levels of development and stability. The theoretical model also evaluated the possibilities and challenges facing each class of countries noting that a major plus for the class of developing countries is the high returns to investment while the risks are high. On the other hand, most developed countries have low returns but are much more stable. By interacting these odds and advantages, the study finds that the odds against the set of developing countries outweighs the advantages leading to net outflow of resources to the set of developed countries. Thereafter, the work introduces political risk, which it treats as a special sort of risk and concluded that it multiplies the potency of other kinds of risks in a way no other risk does. Taking the assumption into the interactive equation, this risk obliterates the little returns and increases the potency of other risks in the set of developing countries. Under such circumstances, equilibrium and stability point in the typical developing economy with poorly developed macroeconomic environment, political institutions and weak markets, is drastically raised and becomes difficult to achieve. There is still the possibility of multiple Nash equilibria as predicted in the Shibuya 2001 model, but the critical minimum point is determined by the level of political risk in the country.

Closely following this is the empirical evaluation of the nature of the relationship among different indicators of risk and domestic macroeconomic policies on the one hand and capital flight on the other. The empirical model has two aims – a) empirically evaluating the relationship between capital flight and risk and b) evaluating the effectiveness or otherwise of fiscal and monetary policies in curtailing flight, with specific reference to Nigeria. To achieve this second set of objectives, the work specifies a macroeconomic model of Nigeria comprising 44 equations (24 stochastic equations and 20 identities) and covering 6 sectors – domestic production and supply, domestic absorption, central government activities, monetary policy, domestic prices and the external sector. Using a mix of linear and log-linear equations, the model found that output in the oil sector is driven by exports and local consumption while non-oil output responds to raw materials imports and aggregate

consumption. Import is a function of import taxes, the real exchange rate, and gross domestic output; consumption is simply the residual of investment while investment depends on the

consumption. Import is a function of import taxes, the real exchange rate, and gross domestic output; consumption is simply the residual of investment while investment depends on the lending rate and real exchange rate volatility. Government taxes, both on domestic output and imports depend on the respective volumes while its expenditure is modeled to reflect ECOWAS protocol ... and this was also significant. Monetary policy reaction function was estimated to show impact of parallel exchange rate, output, interest rate spread (between deposit and lending rates) and broad money supply, which were significant. Price changes follow changes in exchange rate, government expenditure to output ratio and real money supply, while average wage rate mirrors manufacturing capacity utilization. The random walk hypothesis for stock prices was sustained by the model. in the external sector, oil export is a reflection of production, the terms of trade and disputes, while non oil export depends mainly on output in the non-oil sector. Private capital inflow is nearly autonomous while outflow responds to two distortions – real exchange rate volatility and output variability. Net errors and omissions (representing capital flight in the model) respond to distortions in the real exchange rate as well as to both fiscal and monetary policy instruments, but interestingly one of the major determinants of capital flight – the real exchange rate volatility – does not respond to the same set of variables, but is in turn rather affected by capital flight.

5.2 Policy and Future Research Challenges

This work is based on the understanding that that there is pressure on investible capital in most developing countries, especially countries in Sub Saharan Africa (SSA) and particularly Nigeria. Globalization and liberalization of the capital market amplify these challenges as they move initial equilibrium point further away from immediate reach. Increasingly, the stakes for developing countries continue to increase as poorer, more unstable countries are hit worse than the rest of the world by emerging trends in capital account management around the world. With globalization and liberalization, capital availability, movement and utilization in the n (developing) set of countries would increasingly depend not only on policies in those countries, but also on policies and practices in the m (developed) set of countries. However, the net impact will depend on the overall trends in such global integration. For example, if globalization implies only the movement of capital and commodities across borders, then increasing stability in the m set of countries and/or increasing instability in the n set of countries in the face would shift the equilibrium point for capital stability in developing countries upwards and render its attainment more far fetched. However, if globalization also implies higher political interdependence and social mobility

(of labour, skills and ideas) between the developing and developed sets of countries, then instability in one group would translate to instability in the other. In that case, equilibrium point for capital in developing countries would be lower and easier to reach as options for alternative investment destinations for investors in the developing world would diminish.

The point of the last paragraph raises two immediate issues for policy. The first is the attitude of policymakers towards globalization trends. While the West is angling for commodities based and information technology driven globalization, there is little attention paid to idea and skill transfers. However, much of the democratic world is also making a lot of efforts to instill stability and democracy in the developing world – especially Africa and the Middle East. This move is laudable as it facilitates the attainment of initial stability and equilibrium in capital movement for most developing countries. For example, during the 1980s and 1990s when a large number of African countries were in deep crises, capital movement out of the continent hit its worst, but since peace moves were initiated and adopted in several of them, the rate of outflow of such capital has drastically reduced. Rebels in Sierra Leone do not have to loot and sell the country's wealth abroad to prosecute war domestically nor do military leaders of Rwanda have to stash away funds in foreign accounts with their immediate families safely out of harm's way while fighting at home. The efforts of developing countries have to be geared further to drawing attention to the complementary roles of skill and technology transfers to complement these emerging positive trends in politics and economic management in order to have the full benefit of globalization. As the world continues to struggle to meet the MDGs, the importance of good governance and political stability gets more critical. Reducing the turning point and time for reaching stability in investment capital flows for developing countries is an important factor for meeting the MDGs. Given that the MDGs are time-bound commitments, reducing the timeframe for achieving stability in investment and reversing the outflow of investible funds from developing countries within the nearest possible time is a major step towards getting the countries involved to achieve the goals.

The section on empirical model of Nigeria confirms that volatility and risk are critical factors in determining capital flight, corroborating previous studies like Chen and Funke, 2003, Chang and Cumby, 1991 and Cones 1987). In making policy recommendations after his study, Onwioduokit 2002, after making the point of the necessity of appropriate fiscal and monetary policies adds "...policy measures should be instituted to make the domestic

economy more attractive for private investment if capital flight is to be confronted and flight capital recaptured. Specifically, anti inflationary policies such as non-expansionary monetary and fiscal policies and positive real interest rate should be instituted. Furthermore, market determined exchange rate policy should be pursued. Foreign exchange reserves build up should also be pursued as a policy priority..." Shibuya 2001 on his part makes a strong case for sequencing of liberalization and introduction of policies to combat capital flight "... the economy may be trapped in (the) low capital equilibrium if liberalization is implemented before sufficient accumulation of domestic capital." Of course, there may be a few disagreements among authors and policy advisors on the exact nature and components of such risk and instability factors as well as the composition and sequencing of corrective policies, but there is no disagreement as to the fact that risk ranks high among the factors causing and sustaining capital flight. Many African countries (with Nigeria at the forefront) already risk not meeting the MDGs even when, according to Boyce, the continent is a net creditor to the world. Most investors consider the continent too risky and unstable for investment. Reducing this risk is a major means of increasing investment, generating employment and reducing poverty. The fact of Africa having high returns to investment cannot count in investment decisions as long as the continent is so prone to wars and other forms of political instability.

But the other question is the effectiveness of domestic fiscal and monetary policies in curbing capital flight. Several forms of volatility and instability were tried as proxies for the work – real exchange rate volatility, coup, man-days lost on account of disputes, output variability, etc. In many cases, the real exchange rate volatility showed up very significant unlike many other volatility measures. This probably owes to the encompassing nature of real exchange volatility as an economy-wide distortion. As such, real exchange volatility was modeled as a function of monetary and fiscal policies. However, the outcome was not significant. If anything, capital flight itself and coup are the two variables that seem to affect real exchange rate volatility – beside the linear dependence on its own lag, that is. Thus, it seems real exchange rate volatility answers little to quantitative indices of fiscal and monetary policies. However, there is need for some caveats. The use of quantitative data is admittedly incomplete, as policy (including fiscal and monetary) instruments numerously transcend the quantitative. In addition the composition of real exchange rate (as a relative price) definitely transcends the quantitative such that the numbers generated indicate underlying macroeconomic characteristics that include the unquantifiable. Thus, there would definitely

be other forms of government activities that affect real exchange rate volatility and other indicators of instability. Secondly, in the Nigerian case, federalism implies fiscal outcomes that go beyond the Central Government (accounting for no more than 50% of consolidated government activity) and includes the states. But in the course of the work, it was not possible to lay hands on consolidated expenditure and revenue. The implication could have been that while volatility measures is encompassing and includes outcomes of activities of states, monetary and fiscal policy instruments used to evaluate impact here belongs only to the Federal Government. Under such circumstances, the challenge then is to kick-start the process of data generation and storage to include consolidated fiscal and monetary activities of all tiers of government. This again is an issue requiring further enquiry and could be taken up in further studies. There is yet an option, even though the window of its use is gradually closing with trends in integration of both the financial and technological systems of the world. This is the use of capital account controls to minimize capital flight. While flight capital consists mainly of unrecorded flows, stringent penalties could be attached to illegal shipment of funds out of the country. However, it is important, if this is to ever be used, to also create incentives and improve the domestic investment environment to ensure that when such capital outflow is made difficult, there are domestic options for returns to capital. This is a great challenge to institutional capacity building as it would entail a great deal of monitoring and incentive packaging, which is currently lacking in the country. This recommendation is made on the strength of the impact that monetary and fiscal policies have on capital flight when evaluated directly. But such controls are gradually becoming unattractive. Incentives rather than sanctions seem to be increasingly preferred. The challenge then is to maximize the use of incentives in such a way that they impact maximally on the direction of capital movement in the economy.

This section have included caveats to the findings in order to show that there is undoubtedly an array of instruments available to the policymaker than can be quantified. Policy control goes beyond government expenditure and the minimum rediscount rate as used here. The structure of the political system and the nature of enacted laws all impact upon the macroeconomic environment in profound ways. Indeed, as shown in the first section of the methodology, these are the forces that lead to capital flight in the first place. As such, stabilizing the political system, making laws that promote free economic enterprise and increase chances for gainful employment could all go a long way in controlling the movement of capital out of the economy. Secondly, it is possible that given that much of the

funds classified as flight capital were acquired through corruption, the challenge would not be that of finding means of instilling stringent capital controls using traditional stabilization programmes and instruments, but that of controlling the corruption that aid the private acquisition of such funds in the first place. The programme of fighting corruption by the present Obasanjo administration is laudable in this direction, but there is need for its prosecutors to engender more credibility to the project. Also, the present work purposefully limited the regressors to the traditional variables – fiscal balance (the net of revenue and expenditure capturing fiscal policy) and the Minimum Rediscount Rate (capturing policy interest rate and monetary policy). Intermediate policy instruments like the tax system, for varying reasons, could not be used. This again would also prove a fruitful area for future research on this issue.

References

Agenor, P., 2000, The Economics of Adjustment and Growth, Academic Press

Agmon, Tamir (1985), "Political Economy and Risk in World financial Markets", USA/Canada

Ajayi, S. I., 1992. "An Economic Analysis of Capital Flight from Nigeria" World Bank Policy Research Working Paper No. 993.

Ajayi, S. I., 2002, "External Debt, Capital Flight, and Growth in Nigeria" In Iweala et al (Eds) The Debt Trap in Nigeria: Towards a sustainable Debt Strategy. Trenton: Africa World Press, Inc

Alvarez, Luis H. R. and Rune Stenbacka, 2003, "Irreversibility, Uncertainty and Investment in the Presence of Technological Progress' Preliminary version, January 13, 2003 JEL Subject Classification: O32 , G30 , D92 , C61.

Antzoulatos, Angelos A. and Thoedosios Sampaniotis, 2001, "Capital flight in the 1990s – Lessons from E. Europe" Department of Banking and Financial Management, University of Piraeus, Greece and Office of the Prime Minister, Greece

Beja, Edsel L. Jr., Pokpong Junvith, and Jared Ragusett, 2005, "Capital fight from Thailand" *Capital Flight and Capital Controls in Developing Countries*, edited by Gerald Epstein of the Political Economy Research Institute, Edward Elgar Publishing, Spring 2005.

Boyce, J. K., 1992, "The Revolving Door? External Debt and Capital Flight: A Philippine Case Study," *World Development, 20 (3)*, 335-349.

Boyce, J. K., 1993, The Philippines: The Political Economy of Growth and Impoverishment in the Marcos Era, London: Macmillan Press.

Boyce, James K. and Leonce Ndinkumana, 2001, "Is Africa a net Creditor? New Estimates of Capital Flight from severely indebted Sub-Saharan African Countries, 1970 – 1996

Branson W. H., 1989, Macroeconomic Theory and Policy, 3rd Edition, New York; Harper and Row Publishers

Busse, Matthias and Carsten Hefeker (2005), "Political Risk, Institutions and Foreign Direct Investment" Hamburg Institute of International Economics (HWWA) Discussion Paper 315, Department of Economics University of Siegen, Germany April 2005

Carranza, Luis and José E. Galdón-Sánchez (2002), "Financial Intermediation, Variability and the Development Process" Facultad de Ciencias Económicas y Empresariales, Universidad de Navarra Working Paper No. 04/02 June 2002

Central Bank of Nigeria, 2002, *Annual Report and Statement of Accounts, 2002*, Abuja Nigeria

Chang, P. H. and R. E. Cumby. 1991. "Capital flight in sub-Saharan African countries" in rat and John Underwood (eds) Africa's External Finance in the 1990s, The World Bank, Washington.

Chen, Yu-Fu and Michael Funke, 2003, "Option Value, Policy Uncertainty, and the Foreign Direct Investment Decision" Hamburgisches Welt-Wirtschafts-Archiv (HWWA) Discussion Paper 234, Hamburg Institute of International Economics

Claessens, S., and D. Naudé 1993, "Recent Estimates of Capital Flight", Policy Research Working Papers, WPS 1186, Washington, D.C., World Bank, 1993.

Clark, E. (1991), Cross Border Investment Risk, Euromoney Publications, London.

Clark, Ephraim and Radu Tunaru (2000), "Real Options and the Quantification of Multiple Political Risks" A Mimeo on the Internet

Cline, W.R., 1987, "Mobilizing Bank Lending to Debtor Countries", 18, Washington, D.C., Institute for International Economics, 1987.

Cline, W.R., 1985, "International Debt: Analysis, Experience and Prospects." *Journal of Development Planning* 16: 27 – 37.

Collier, Paul, Anke Hoeffler, and Catherine Patillo (1999), "Flight Capital as a Portfolio Choice" World Bank Policy Research Working Paper Series 2066; February 1999

Cones, E. R. 1987, "The Causes of Capital Flight from Latin America", Inter-American Development Bank Washington D.C.

Cuddington, John T., 1986, "Capital Flight: Estimates, Issues and Explanations", Princeton Studies in International Finance, 58, Princeton NJ, Princeton University, 1986.

Cuddington, J. T., 1987, "Macroeconomic Determinants of Capital Flight: An Econometric Investigation," in Lessard, Donald and John Cuddington (Eds.) *Capital Flight and Third World Debt*. Washington, DC: Institute for International Economics, 85-96.

Dixit, A. and R.S. Pindyck, 1994, "Investment under Uncertainty", Princeton: Princeton University Press.

Dooley, M., 1986, "Country-Specific Risk Premiums, Capital Flight, and Net Investment Income Payments in Selected Developing Countries" Mimeo, Washington, D.C., IMF, 1986.

Dooley, M., 1988, "Capital Flight: A Response to Differences in Financial Risks," *IMF Staff Papers, 35(3)*, 422-436.

Duwendag, D. 1989, "Capital flight from developing countries" *Development Co-operation 3*

Erb, Claude B., Campbell R. Harvey and Tadas E. Viskanta, 1996, "Political Risk, Economic Risk and Financial Risk" First Chicago Investment Management Co., Chicago, Duke University, Durham, NC 27708, and National Bureau of Economic Research, Cambridge, MA. Draft of an article published in the November/December 1996 *Financial Analysts Journal*

Erdal, Bahar, 2003, "Investment Decisions Under Real Exchange Rate Uncertainty" *The Central Bank of the Republic of Turkey, Foreign Relations Department 06100 Ulus-Ankara*

Federal Government of Nigeria, 2004, "The National Economic Empowerment and Development Strategy (NEEDS), National Planning Commission, Abuja

Felding, David, 2003, "How Does Civil War Affect the Magnitude of Capital Flight? Evidence from Israel during the *Intifada"*, Department of Economics, University of Leicester and WIDER, United Nations University, Helsinki, *Second Draft: June 2003*

Gibson, Heather D., and Euclid Tskalotos, 1993, "Testing a Flow Model of Capital Flight in Five European Countries," The Manchester School, 61, 2, 1993, pp. 144-166.

Goldberg, P.K. and M. M. Knetter, 1997, "Goods prices and exchange rates: What have we learned?" *Journal of Economic Literature* 35 (3), 1243-1272.

Haendel, Dan, 1979, "Foreign Investments and the Management of Political Risk", Westview special studies in international Economics and Business

Hampton, T., 2001, "How much do Import Price shocks matter for Consumer Prices?" Discussion Paper 2001/06, Reserve Bank of New Zealand, November.

Hermes, N. and R. Lensink, 1992, "The Magnitude and Determinants of Capital Flight: The Case for Six Sub-Saharan African Countries," *De Economist. 140 (4)*, 515-530.

Hermes, Niels and Robert Lensink, 2001, "Capital flight and the uncertainty of government policies" *Economics Letters* 71 (2001) 377–381

Hufner,F.P and Schroder, M., 2002, "Exchange Rate Pass-Through to Consumer Prices : A European Perspective" .Bruchsal, Germany: Center for European Economic Research (ZEW)

Ingersoll, J. and S.A. Ross, 1992, "Waiting to Invest: Investment and Uncertainty", *Journal of Business* 65, 1-29

Jensen, Nathan, 2005, "Measuring Risk: Political Risk Insurance Premiums and Domestic Political Institutions", Paper presented at the 2005 Political Economy of Multinational Corporations and Foreign Direct Investment Conference at Washington University, 2005

Kamga-Wafo, Guy Leopold, 1998, "Political Risk and Foreign Direct Investment" Doctoral Thesis for the Faculty of Economics and Statistics, University of Konstanz, supervised by Prof. Heinrich Ursprung and Prof. Albert Schweinberger

Kant Chander 1996, "Foreign Direct Investment and Capital Flight" *Princeton Studies on International Finance* No 80 March 1996

Khan, M and N. Ul Hague 1987, "Capital flight from developing countries" Finance and Development Vol. 24 (1)

Kindleberger, C. P., 1937, International Short-Term Capital Movements, New York: Augustus Kelley

Lensink, Robert, Niels Hermes, and Victor Murinde, 1998, "Capital Flight and Political Risk" Department of Economics, University of Groningen and Birmingham Business School, University of Birmingham, August 1998

Lensink, R., N. Hermes, and V. Murinde, 2000, "Capital Flight and Political Risk," *Journal of International Money and Finance, 19*, 73-92.

Ljungwall, Christer and Steven Wang, 2004, "Why is Capital Flowing Out of China?" China Centre for Economic Research at Peking University and Department of Economics, Goteborg University, Sweden.

Mallick, Sushanta K, 1997, "Dynamics of Macroeconomic Adjustment with Growth: Some Simulation Results" Department of Economics, University of Warwick Coventry CV4 7AL, UK, January 1997

McKinnon, Ronald, 1999, "Limiting Moral Hazard and Reducing Risk in International Capital Flows: The Choice of an Exchange Rate Regime" Mimeo, Stanford University

Mikkelsen, J. G., 1991, "An Econometric Investigation of Capital Flight," *Applied Economics*, 23, 73-85.

Morgan Guaranty 1986, "LDC Capital Flight," World Financial Markets, 2, 1986, pp. 13- 16.

Ndikumana, Léonce and James K. Boyce, 2002, "Public Debts and Private Assets: Explaining Capital Flight from Sub-Saharan African Countries" Political Economy Research Institute Working Paper Series Number 32 August 2002, University of Massachusetts Amherst

Nyoni, T, 2000, "Capital Flight from Tanzania," in Ajayi, Ibi and Mohsin Khan (Eds.) *External Debt and Capital Flight in Sub-Saharan Africa*. Washington, D.C.: The IMF Institute, 265-299.

Onwioduokit, E. A., 2002, "Capital Flight from Nigeria: An Empirical Re-Examination" West African Monetary Institute Accra, Ghana.

Pakko, Michael R. 1999, "Do High Interest Rates Stem Capital Outflows?" Federal Reserve Bank of St. Louis Working Paper 1999-002A; Published in Economic Letters, April 2000, 67, pp. 187-92 Federal Reserve Bank of St. Louis Research Division

Pastor, Manuel Jr., 1990, "Capital Flight and the Latin American Debt Crisis" Economic Policy Institute Working Paper" 1730 Rhode Island Ave., NWI: Suite 812, Washington, DC 20036

Pierdzioch, Christian, 2003, "Capital Mobility and the Effectiveness of Fiscal Policy in Open Economies" Kiel Working Paper No. 1164; Kiel Institute for World Economics, Duesternbrooker Weg 120 24105 Kiel, Germany

Romer, D., 1996, Advanced Macroeconomics New York, McGraw Hill

Robock, Stefan. H. and Simmonds, K., 1973, "International Business and multinational Enterprise" R. Irwin, Homewood

Root, Franklin, 1973, "Analysing political risks in international business, in Ashok Kapoor and Phillip D. Grub, (eds), *Multinational Enterprise in Transition*. Darwin Press, Princeton

Rummel Rudolf and Heenan David A., 1978, "How Multinationals analyze Political Risk" Harvard Business Review, January-February 1978

Schneider, Benu, 2003, "Measuring Capital Flight: Estimates and Interpretations" Overseas Development Institute Working Paper 194, March 2003, 111 Westminster Bridge Road, London SE1 7JD UK

Shibuya, Hiroshi, 2001, "Economic Takeoff and Capital Flight" Economic and Social Research Institute Discussion Paper Series No.8 December 2001, Cabinet Office Tokyo, Japan

Soludo, C. C., 1996, Macroeconomic Policy Modelling of African Economies, Enugu: Acena Publishers

Stevenson, A., V. Muscatelli and M. Gregory, 1988, Macroeconomic Theory and Stabilization Policy London: Philip Allan

Ul Haque, Nadeem and Moshin S. Khan, 1985, "Foreign Borrowing and Capital Flight" *IMF Staff Papers* 32 (4), 606 – 628

Vayanos, Dimitri, 2004, "Flight to Quality, Flight to Liquidity, and the Pricing of Risk" National Bureau of Economic Research (NBER) Working Paper 10327, Cambridge, Massachusetts, February 2004.

Vos, R., 1992, "Private Foreign Asset Accumulation, Not Just Capital Flight: Evidence from the Philippines," *Journal of Development Studies, 28(3)*, 500-537.
World Bank 1985, *World Development Report 1985*, Washington, D.C., the World Bank.

Zilberman, David, 1999, "Irreversibility and Option Value" Department of Agricultural and Resource Economics EEP 101, University of California at Berkeley