

**CAPITAL FLIGHT AND ECONOMIC GROWTH IN
NIGERIA (1970 -2011)**

BY

OKE, MICHAEL OJO
MATRIC NO: 019025022

B.Sc (Hons) 1999, OSUA; M.Sc. 2003 UNILAG

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CERTIFICATION

This is to Certify that the Thesis:

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BY

OKE, MICHAEL OJO

In the Department of Finance

OKE. M.O
AUTHOR’S NAME	SIGNATURE	DATE
PROF. (Mrs.) E.O ADEGBITE
1 ST SUPERVISOR’S NAME	SIGNATURE	DATE
Dr. J.E EZIKE (Associate Prof.)
2 ND SUPERVISOR’S NAME	SIGNATURE	DATE
.....
1 ST INTERNAL EXAMINER	SIGNATURE	DATE
.....
2 ND INTERNAL EXAMINER	SIGNATURE	DATE
.....
EXTERNAL EXAMINER	SIGNATURE	DATE
.....
SPGS REPRESENTATIVE	SIGNATURE	DATE

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DEDICATION

This thesis is dedicated to the Almighty God who gave me the courage, grace and strength to start and complete this programme.

LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller Test
AFEM	Autonomous Foreign Exchange Market
BOP	Balance of Payment
CAB	Current Account Balance
CBN	Central Bank of Nigeria
DFI	Direct foreign Investment
DMO	Debt Management Office
DOP	Degree of openness
DR	Deposit Rate
ECM	Error Correction Mechanism
EXDEBT	Change in External Debt
FOS	Federal Office of Statistics
GCF	Gross Capital Formation
GDI	Gross Domestic Investment
GDP	Gross Domestic Product
GOCE	Government Current Expenditure
Hi	Alternative Hypothesis
HICs	Highly Indebted Countries
Ho	Null Hypotheses
IMF	International monetary fund
INF	Inflation Rate
KF	Capital flight
LDCs	Less Developed Countries
MORG	Morgan Trust

NEXTAS	Increase in Foreign Asset of Domestic Banking System
OLS	Ordinary Least Square
OPEC	Organization of the Petroleum Exporting Countries
PRIVCR	Credit to Private Sector
RES	Change in External Reserve
SAP	Structural Adjustment Programme
USA	United State of American
USIRD	United State of America Interest Rate Differential
WB	World Bank

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ABSTRACT

This study examines the determinants of capital flight in Nigeria and their effects on economic growth between 1970 and 2011. In analyzing the determinants of capital flight, eight (8) variables classified as political, economic and institutional were employed. These include: Degree of Openness, Inflation rate, Gross capital formation, Change in External debt, Deposit rate, Credit to Private sector, Interest rate differentials and Government consumption expenditure (GOCE). Six models were formulated; model 1, 3, and 4 examined the determinants of capital flight in the Pre and Post-SAP era while model 2, 5 and 6 examined the effect of capital flight on the economy in the Pre and Post-SAP era with Gross Domestic Product as the dependent variable and Change in External debt, Direct Foreign Investment, Current Account Balance, Change in External Reserve and Change in Net Foreign asset of Domestic Financial Institutions as explanatory variables. The study employs the residual method of capital flight estimates while data were sourced from the Central Bank of Nigeria's Statistical Bulletin, the Nigeria Stock Exchange Fact Books and IMF's Financial Reports. The Ordinary Least Square Method of Regression analysis and Co-integration Technique were employed to estimate and test the formulated models and hypotheses. Findings from the analyses reveal that both short and long run relationships between the dependent and independent variables. Specifically, the results reveal that Change in External Debt, Inflation rate, Political and Institutional risks constitute the major determinants of capital flight in Nigeria over the period of study. The post-SAP analysis shows that Change in External Debt and Inflation rate greatly induced capital flight which adversely affected the economy. Statistically, the test of hypotheses conducted at 95% level of confidence shows the significance of the variables. The results also show that Change in external debt negatively impact economic growth, while Direct Foreign Investment, Change in Foreign Asset of Domestic Banking System and Change in External Reserve positively impact the economic growth. The study established a link between External debt, poverty and economic growth. It was also revealed that capital flight was more prevalent in Nigeria during the period of transition from one regime of government to another due to political crises and uncertainty. The study recommends among others that Government should provide economically viable environment that will encourage investment while statutory agencies like the Economic and Financial Crime Commission and the Independent Corrupt Practices and Other Related Offences Commission should be adequately funded and empowered to handle financial crimes. Finally, it was recommend that serious and sincere effort should be made by the government to recover stolen and ill-gotten wealth by public officers and the proceeds recover from corrupt officials should be ploughed back into the economy while the government should implement policies that are suitable for the Nigerian environment. One of the major contributions of the study to knowledge is that it confirmed that economic, political and institutional factors are the main determinants of Capital Flight in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

There has been rapid growth and mobility of international capital with some attendant risks and benefits to the World economic systems over the years. One of such risks is that of fuelling capital flight. There exists no generally accepted definition of the term “capital flight”. Most of the time, this term is related to capital this is shifted out of developing countries (Capital Scarce-economy) to developed countries (Capital abundant-economy). However, if capital shifts out of the developed country, it is usually referred to as capital outflow. Investors from developed countries are seen as responding to investment opportunities while investors from developing countries are said to be escaping the high risks they perceive of holding capital at home (Ajayi, 1997). According to Cooper and Hardt (2000), capital flight entails the flow of financial assets resulting from the holder’s perception that capital is subjected to inordinate level of risk due to devaluation, hyperinflation and/or political turmoil. The owners of funds in such hostile environment are seeking a safe haven for their funds. Ndikumana and Boyce (2003) define capital flight as residents’ capital out flows, excluding recorded investment abroad.

It is important to note that when capital flows from a developed to a developing country it is not considered as capital flight. Also when capital flows from a developing to developed countries through legal means and for investment purposes it is also not considered as capital flight. However, when capital flows from a developing to a developed country through illegal means it is capital flight. It is very difficult to measure illegal flows; however, the major means of measuring capital flight in this study is to capture the difference between the sources and uses of funds. The main sources of capital to an economy are external borrowing and direct foreign investment while the uses of funds include financing of current account balance and external reserves, this difference constitutes capital flight.

Given the above therefore, for the purpose of this research, capital flight is defined as the net illegal outflow of capital from Nigeria arising from the difference between the sources and uses of funds. Capital flight is clearly different from capital export, which consists of conveyance of capital in full accordance with the law. While capital export is a normal economic phenomenon, which does not harm significantly the economy from the global perspective (capital finds its optimal allocation), capital flight presents a danger and leads to the impoverishment of the domestic economy. To a large extent, capital flight has been regarded as a major factor contributing to the mounting external debt problems and inhibiting developmental efforts in the third world, (Cuddington, 1986). External debt in Nigeria, for example, increased by 700 percent from \$3.5 billion in 1980 to \$28.0 billion in 2000 and \$35 billion in the year 2010 (CBN, 2011 and DMO, 2011). Most analysts have also attributed sluggish growth and persistent balance of payments (BOP) deficits to capital flight in developing countries including Nigeria, despite private transfers and long term capital inflows (Ajayi, 2012). Capital flight is different from capital export which is a normal economic phenomenon, subject of course to regulation and not posing danger to the national economy. Capital export can foster export growth and generation of employment in addition to the provision of solution to other national economic problems (Grigoryev and Kosarev, 2000).

The issue of capital flight from developing countries, including Nigeria, has received appreciable attention from researchers. Concerns have been expressed about the magnitude, causes and consequences of these capital outflows, not least because the lack of financial resources for appropriate economic development has pushed Nigeria and most other sub-Saharan African (SSA) countries into external borrowing to augment domestic resources in their quest for economic growth. Acquisition of foreign assets by residents has escalated even as developing countries' search for external borrowings to enhance the inflow of resources. Researchers like Cuddington (1987) and Pastor (1990) have shown that developing countries' borrowing are substantially diverted into private assets abroad resulting into high debt profile and low economic growth.

However, a study of capital flight is incomplete without a preliminary examination of the structure of the Nigerian economy and its political history. Ordinarily, Nigeria was an agrarian society with agriculture accounting for at least 65% of the GDP. The contribution of the sector gradually declined due to the

emergence of crude petroleum in 1970 when Nigeria became a member of OPEC. Thereafter, oil became the mainstay of the economy (Onwiodukit, 2007). The oil boom of the early 1970s had a pervasive effect on the growth and development of the economy. It suddenly became the dominant sector of the economy accounting for more than 90% of exports and main source of revenue. However, the oil revenue witnessed growth overtime and the growth was absorbed mainly by public sector spending, particularly on transportation, social services, education etc. but considering their long run financial implications and efficiency with which the projects where price increases secured the resource needed to accommodate the supply in non-traded goods but they depressed the non-oil traded goods sectors.

Nigeria borrowed significantly during this period to procure foreign goods. In 1978, economic problems started to manifest but a second oil-boom in 1979 brought about confidence that oil proceeds could be a sound basis for planning and sustaining public sector consumption and investment. The second oil-boom coincides with the civilian government (second republic). The increase in oil revenue gave the government impetus to increase public expenditure and real income declined. Then, the government was forced to run deficit budget and finance this by borrowing. Also, the value of exchange rate began to appreciate and this placed export at a disadvantage position. The distorted exchange rate prevented the government from allocating resources efficiently to purchase import.

Based on this, government established several measures and stringent trade control in the economy, stabilization heat of 1982. Besides, public investment was cut noticeably and petroleum products' prices and tariffs were raised. In spite of these stringent measures, the economy reached a crisis point in 1983 and 1984 when oil earning declined drastically. To fill the domestic savings gap in order to execute developmental projects, government continued to borrow heavily and the external debt was mounting, this put unnecessary pressure on BOP position.

Nigeria's indebtedness impeded her access to foreign capital and short term trade arrears amounts to the point at which foreign banks held back on confirming letters of credit. Due to her unwillingness to devalue naira, donors refused to roll over short term debt or fresh capital. This persisted until the military seized

power in 1983. The military government strengthened the strict measure of 1982, then imposed wage freeze on public sector employees, enforced the redundancy of a vast number of civil servants and introduced user's fee in education and health sectors. Yet, their measures made little impact on budget deficit as the deficit in budget was manifested by capacity underutilization widespread closure of plants. Decline in imports and exports was accompanied by a significant rise in domestic price levels, inflation rate escalated, domestic savings and investment fell drastically, private investment also fell coupled with the reluctance of the donors to release fresh debt, it became difficult to accumulate capital (GCF) which is a major ingredient in developmental process. Meanwhile, government could not reach an agreement with the Bretton Woods institution on several issues including devaluation of the naira and import liberalization. Thus, a significant difference emerged between Nigeria government and its creditors. Later, a new Military administration emerged in 1998 without proper accommodation of the multi-lateral lending institutions; the prospect for more credit was bleak. This led to the adoption of SAP. This programme brought some far-reaching reforms on the Nigerian economy, such as devaluation of exchange rate, liberalization of interests' rates, imports and exports, commercialization and privatization of several public enterprises and so on. Suddenly, there were reverse in the old trend as GDP started to witness growth, but inflation rates worsen. Interest rates reforms did not yield the desired result due to frequent policy changing. In the era of high inflation rate, the real rate of interest became negative. From 1985, the interest rate, direct foreign investment and foreign exchange had been liberalized of AFEM. The 1997 monetary and banking policies adopted in the federal budget as well as entire financial system restructuring as well as, the fiscal surplus achieved in the last two years (1999) appeared to seemingly approximate the precondition for preventing capital flight. Thus, the need to sustain and improve the seemingly enabling environment in order to consolidate growth reduce external debt through restructuring programmes in agreeable to the Bretton wood institutions that could illicit favourable disposition by our donor nations in ensuring debt reduction for Nigeria cannot be overemphasized.

Again, series of conflict which arose in 1990s and late 2000s led to massive capital outflow rom Nigeria, most especially that of the Niger Delta and Boko Haram insurgent. That of the Niger Delta arose due to

tensions between the foreign oil corporations, the Nigerian Federal Government, and a number of the Niger Delta's ethnic groups who felt they were being exploited, particularly the minority groups like the Ogoni, as well as, the Ijaw in the late 1990s. Ethnic and political unrest have continued throughout the 1990s and persists as of today despite the conversion to a more democratic regime. The main causes of Niger Delta crisis include greed and selfishness, deprivation and poverty, and social injustice, Okonta and Douglas (2001). Apart from this, the series of hostage taking sent a shock wave in the global oil market and the price of oil skyrocketed. Political instability is injurious to an economy, as it induces capital flight. Businesses and individuals began to perceive the nation as non-stable economy and started to move their investments to more secured economies. Capital flight has a multiplier effect on an economy. It impedes business investment, economic growth and productivity, spurs inflation and unemployment and negatively affects the living standards of the people. Political instability also affects a nation's national income, when investors and individuals in the society begin to perceive the crisis as a serious threat to their investment and savings, they will sell off their assets and buy assets in other politically secured and stable societies. If the crisis is allowed to continue for a long time, it will affect Nigeria's income, and by extension, its national budget, because oil contributes about 70% of her income. The world has long seen Nigeria as a non-stable economy and a sinkhole that could swallow their investment (Jeffrey, 1996).

1.2 Statement of the Problem

Capital flight has been identified as a major cause of foreign exchange shortage, chronic poverty and heavy debt burden in developing economies including Nigeria. This is because capital constitutes a drain on the national resources which ought to be useful for financing economic growth (Ajayi, 2012). The means or method of capital flight has been seen as taking various forms, including corruption, currency smuggling, trade record manipulation (over invoicing of imports and under invoicing of exports), electronic fund transfers from private banking services, declaring of non-existing foreign debts and commission and agents' fees or kickbacks in foreign contracts fees etc. Other means of capital flight include overseas investments emanating from illegal activities like drug trafficking, illicit activities, particularly, those related to tax evasion and exchange rate controls. This is consistent with the view held by Husted and Melvin (1990) that

the acquisitions of such foreign assets occur in response to political or economic crisis in the developing countries. Findings have shown that most of the capital flights from the underdeveloped countries are held in foreign bank accounts like the Swiss Bank Accounts because the principle of national sovereignty, (which includes domestic bank secrecy laws and blocking statute), prevents disclosure, inspection, removal or copying of documents without official approval (Nyong, 2003). The capital flights are held not only in bank deposits in developed countries' banks, but also in treasury bonds, treasury certificates and bills, equities and physical assets abroad.

Capital flights for recent years in Nigeria have been seen as important impediments towards achieving desired economic growth, external assistance or lending to developing countries. The International Monetary Fund (IMF) for example has made the adoption of policies for reversal (i.e. return) of capital flight a condition for its support of debt relief (Pastor 1989). Consequently, substantial debt relief from Paris club members had been difficult because of the size of capital flight from the debtors' countries. The adverse effects of capital flight in the development of developing countries are enormous and severe. It leads to reduction and fall in growth potential through fall in investment. The fall in growth in turn leads to fall in employment creation and the inability to service debt obligations. Since the fundamental concern about capital flight is its tendency to reduce welfare, bring about fall in total real resources available to an economy for investment and growth and divert the domestic savings away in favour of foreign financial investment, there is the need to drastically reduce the rate and magnitude of capital flight in Nigeria.

The problem of high debt profile and increasing capital flight in Nigeria has led to low gross capital formation, lack of adequate infrastructures and deteriorating economic condition (Ajayi, 2005). Despite this situation, every tier of government is engaging in external borrowing, according to the Nigerian Debt Management Office (DMO, 2013), Nigeria's external debt for year 2012 alone stood at \$9 billion. Going by this trend, the projected external debt for 2013, 2014 and 2015 respectively are \$9 billion (about ₦1, 350 billion), \$14.5 billion (about ₦2, 175 billion) and \$16.7 billion (about ₦2, 505 billion). This is in addition to about \$6.48 billion (₦972 billion), \$7.1 billion (about ₦1065-billion), \$7.7 billion (about ₦1, 155 billion) and \$8.4 billion (about ₦1, 260 billion) local debts respectively for 2012, 2013, 2014 and 2015

respectively, this has become a concern and a source of worry. While it is very necessary to source for external capital to promote economic growth, it is more important to ensure that these funds are retained and used for the purpose of economic growth. To be beneficial and not to become a burden to the nation, there is the need to examine the various determinants of capital flight in Nigeria, as well as, the effect of these variables on the nation's economic growth. Despite the various studies that have been done on capital flight in Nigeria, a critical analysis of the effect of economic, political and institutional variables as they affect the level of capital flight in Nigeria has not been clearly investigated, this is the main gap this study intends to filled.

1.3 Objectives of the Study

The broad objective of the study is to examine the determinants and impact of capital flight on the Nigerian economic growth between 1970 and 2011. The specific objectives of the study are to:

- (i) Examine the determinants of capital flight in Nigeria;
- (ii) determine the effect of capital flight on Nigeria's economic growth;
- (iii) identify factors influencing portfolio choice of private wealth holders in Nigeria;
- (iv) determine how to stem and recapture the capital flight;

1.4 Research Questions and Hypotheses

1.4.1 Research Questions

This following research questions are to be answered in the course of this study:

1. What are the determinants of capital flight from Nigeria?
2. What are the effects of capital flight on the Nigerian economy?
3. What are the main factors influencing portfolio choice of private wealth holders in Nigeria?
4. How can capital flight be stemmed and reversed in Nigeria?

1.4.2 Research Hypotheses

In order to achieve the above stated objectives, the following five null hypotheses are formulated for testing:

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₂: Capital flight has no significant effect on the Nigeria's economic growth.

H₀₃: Political, Economic and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄: Capital flight cannot be stemmed nor reversed in Nigeria.

1.5 Significance of the Study

In view of the adverse implications of capital flight, providing insight into possible strategies to effect capital flight reversal is crucial at this time. Given the perspectives from which capital flight can be viewed, it is important to study it for any economy in order to ascertain which of the perspectives of capital flight really holds for the country. The economic arguments against capital flight from developing countries are not only convincing but are often too strong to be ignored. First, the outflow of capital can cause a shortage of liquidity in the economy and thereby create a shortfall in the amount of funds that are needed for the importation of productive goods, as well as, intermediate goods which are needed for development. In addition, the shortage of liquidity in the economy can lead to the exertion of upward pressure on interest rates.

Furthermore, given the fact that capital outflow is a diversion of domestic savings away from domestic real investment, the pace of growth and development is retarded from what it would have been otherwise. Again, the income that is generated abroad and the wealth that are held abroad are outside the purview of domestic authorities and therefore cannot be taxed. Thus, potential government revenue is reduced and hence the debt-servicing capacity of government's debt is affected. The aforementioned consequences of capital flight call for prompt attention and the findings of this study will be of high significance to the government, the academic community, future researchers, local and foreign investors and the entire public.

Despite the pronounced occurrence of capital flight in Nigeria, previous studies have focus mainly on the economic and political dimensions of the causes of capital flight, however, recent occurrence of Financial institutions instability reveal that institutional factors could play a very critical role in stemming or boosting the incidence of capital flight from the domestic economies of developing nation. Hence, this research fills a crucial gap in literature in that it examines the economic, political and institutional determinants of capital flight in Nigeria as well as the effect of these variables on the economy in order to provide reliable empirical evidence.

1.6 Scope and Delimitation of the Study

The focus of this thesis is the determinant and effect of capital flight on Nigeria's Economic Growth between 1970 and 2011; this makes a time horizon of 42 years. The period was further broken to the pre and post SAP era so as to capture the effect of policy change with the introduction of Structural Adjustment Programme of the Federal Government in 1986. The period under consideration is chosen because of major economic and political events during the period. For instance, 1970 marked the period of Oil boom in Nigeria; this period witnessed mass movement of domestic capital due to political uncertainty and risk. The period under consideration equally witnessed the introduction of various economic policies which substantially impacted capital outflow from the country.

1.7 Limitation of the Study

The main limitation of this study is that there are various concepts and method of estimating capital flight; this includes the Balance of payment approach, the Residual approach, Bank deposit approach, Dooley approach and Hot money approach. These approaches view the estimation of capital flight from different dimensions; however, this study employs the residual approach because it is more accurate and data for its components are easily gotten from montly, quarterly or annual published reports of accredited local and national institutions like the Central Bank of Nigeria, World Trade Reports and World Bank. The residual Approach measures capital flight as the difference between sources and uses of fund. Another major problem is the discrepnnces noticed in the published data of major institutions of referenced.

1.8 Organization of the Study

This sthesis comprises of six comprehensive chapters. The first chapter is concerned with the background and introduction to the topic. It also explains the objectives and the hypotheses intended to be tested. Chapter two examines critically the conceptual framework and literature review, studying exhaustively the various concepts, theoretical reviews and various reviews of empirical studies on the determinants of capital flight in Nigeria. Chapter three examines the method adopted in the study. This also examines the method of analysis and various statistical test carried out in the study. Chapter four is about the presentation and analysis of the data while chapter five examines the discussion and summary of findings and chapter six treats the conclusion, recommendations and contribution to knowledge.

1.9 Operational Definition of Terms

In the context of this study, the following terms are defined as stated below:

- i. **Capital Flight:** This connotes illegal movement of capital or funds from one country to another as a result of political, economic and institutional unvertainties.
- ii. **Money Laundering:** This refers to an act of converting financial proceeds realized from illegal dealings such as hard drugs into legal investment.
- iii. **Corruption:** It is an act of misuse of power for personal economic benefits.
- iv. **The Dutch Disease Theory:** The Dutch disease effect refers to economic misfortune after apparent good fortune.
- v. **Volatility:** This is the probability that borrowed funds will be illegally transferred out of a country due to political uncertainty.
- vi. **Capital Outflow:** This is the legal conveyance of capital abroad, which is in full compliance with all requirements of the law.

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CHAPTER TWO

LITERATURE REVIEW

2.1 The Concept of Capital Flight

Studies on capital movement from the African continent and Latin American countries have revealed that capital flight, as well as, any outward movement of capital from countries has a harmful effect on the economy of such countries. Capital flight has existed since the 1970s, Cuddington (1986) and Conesa (1987) in these countries. Although, there is no generally acceptable definition of capital flight, the literature has postulated three major reasons for the existence of capital flight; these are investment, money laundering, and/or tax evasion. For capital flight to be accredited to money laundering, the sources of funds or the money moved has to be illegal in origin. Few studies, mainly those of Walker (2002) and Unger *et al.* (2006), were able to determine the sources of funds. Of the studies that included tax rates in their study (e.g., Dooley, 1986; Dooley and Kletzer, 1994), none were able to conclude that capital was moved from a country to avoid paying taxes.

Even though researchers have long recognized trade misinvoicing as a major channel for illegal flows of money through the over-invoicing or under invoicing of imports or exports, research has not determined whether such activity constitutes a component of capital flight (Ajayi, 1992, 1997; Ndikumana and Boyce, 1998; Patnaik and Vasudevan, 2000; Almounsor, 2005; Salisu, 2005; Beja *et al.*, 2005; Zhu, *et al.*, 2005), a cause of capital flight (Claessens and Naudé, 1993; Rustomjee, 1991), or simply a means to evade taxes. Although Chang and Cumby (1991) estimated that \$12 billion from the Sub-Saharan region and \$17 billion from other African countries were moved to the U.S. between 1976 and 1987 through trade misinvoicing, they argued that the systemic under reporting of trade figures in both directions to avoid trade barriers seems to overwhelm any discernible capital flight through misinvoicing. Gibson and Tsakalotos (1993) made the argument that trade misinvoicing may be unrelated to the phenomenon of capital flight, which was supported by Hermes, Lensink, and Murinde (2002). Although, the study of Obadan (2008) asserts that, trade misinvoicing can be correctly regarded as capital flight. Cerra, *et al.* (2008) find out that trade

misinvoicing —as a mechanism of capital flight, appears to behave differently from other components of capital flight. The enormous differences in the definition of capital flight and the difficulty in determining an accurate measure of trade misinvoicing prevents an easy answer.

Capital flight has also been argued to stem from many factors, classified into political and economic factors Ajayi (1992). Ajayi argued that the political aspect of capital flight is often ignored in most analysis on capital flight, and this is predicated on corruption (a problem which is hardly limited to LDCs) and access to foreign funds by political leaders. Beginning in the mid-1980's, the phenomenon of capital flight from developing countries received considerable attention in the literature. A number of country-specific case studies and cross-country studies have examined the magnitude of capital flight, its causes, and its effects (Ajayi 1997). Until recently, however, sub-sahara Africa has received less attention than other developing regions, yet capital outflows from African economies deserve serious attention for several reasons away from domestic investment and other productive activities. In recent decades, African economies have achieved significantly low investment levels than other developing countries (International Finance Corporation, 1998; Ndikumana and Borce, 2003). These low levels of domestic investment are attributable, in part, to the apparent scarcity of domestic savings, weak and shallow financial systems, and high country risk due to unstable macroeconomic and political conditions. Capital flight is both a cause and a symptom of this weak investment performance. Secondly, capital flight is likely to have pronounced regressive effects on the distribution of wealth. The individuals who engage in capital flight generally are members of the sub-continent's economic and political elites, who take advantage of their privileged positions to acquire and channel funds abroad. Both the acquisition and the transfer of funds often involve legally questionable practices, including the falsification of trade documents (trade misinvoicing or faking), the embezzlement of export revenues and kickbacks on public and private sector contracts (Ndikumana and Boyce, 1998). The negative effect of the resulting shortages of revenue and foreign exchange fall disproportionately on the shoulders of the less wealthy members of the society. The regressive impact of capital flight is compounded when financial imbalances results in devaluation, the wealthy that hold external assets are insulated from its effects, while the poor enjoy no such cushion.

A third reason for greater attention to African capital flight is that most developing countries remain in the grip of severe external debt crises. Debt service today absorbs a sum equivalent to more than 60% of developing country's GDP. In so far as the proceeds of external borrowing are used not to the benefit of the African public, but rather to finance the accumulation of private external assets by the ruling elites, the moral and legal legitimacy of these debt-service obligations is open to challenge.

This section of the study deals with several issues on capital flight such issues cover those on prior studies, issue of measurement, causes and effects, political and macro-economic developments in Nigeria as they have a bearing on capital flight. A detailed analysis of trade-faking, that is, the under-invoicing/over-invoicing of exports and imports, definitions of the concept and others that can increase the flight of capital from Nigerian economy were faked.

2.2 Operationalisation and Measurement of Capital Flight

Capital flight represents the transfer abroad and out of reach of domestic law enforcement and national tax administrations, of illegally acquired income or assets. Money laundering which connotes the transfer of illegal earnings and assets into legal earnings and assets falls into this category. Capital flight also includes the transfer abroad of legal, legitimately acquired income or assets, motivated by the desire to escape either legitimate domestic tax authorities in collusion with corrupt government officials. Generally, the following schools of taught represent the various perspectives of the concept of capital flight in the literature (Eggerstedt *et al.*, 1995)):

(i) The Balance of Payment Account Approach

In the pioneering studies on capital flight; the phenomenon relies on using the balance of payment account (Cuddington, 1986). In the balance of payment approach, capital flight is defined as the sum of recorded short term capital outflows (K) and unrecorded net flows or net errors and omission (M)

$$KF(BOP) = K + M(2.1)$$

Where:

- KF (BOP) = Capital Flight measured by the Balance of Payments Approach
- K = Sum of recorded short term capital outflows
- M = Sum of unrecorded net flows or net errors and omission

Cuddington (1986) observed that private short-term capital movement is either imprecisely reported or not reported at all especially in countries which impose capital controls. The failure to precisely record short-term flows show up in net errors and omissions of the countries balance of payments.

(ii) **The Residual Approach**

The residual approach consists of two versions namely: the World Bank and Erbe (1985) version and the Morgan Guaranty Trust (1986) version. In the World Bank and Erbe (1985) version of the residual approach, capital flight is defined as the difference between sources and uses of capital inflows and the source of capital inflows are increases in external debt and foreign direct investment. These capital inflows are used to finance either current account deficits or increase in official reserves. The inflows that finance neither current account deficits nor increases in reserve constitute capital flight. In essence, capital flight in the World Bank and Erbe (1985) version of the residual approach is measure as:

$$KF(WB) = \delta EXDEBT + G + F - N.....(2.2)$$

Where:

- KF (WB) = Capital Flight measured by the World Bank approach,
- δ EDEBT = Changes in External Debt.
- G = Foreign Direct Investment
- F = Current Account Balance
- N = Change in Reserve

Positive value of KF (WB) represents capital flight while negative value is capital re-flows or the reverse capital flight.

Morgan Trust (1986) approach rose out of the feeling that the balance of payments accounts were not sufficient to estimate resident capital outflows. The approach adjusts the World Bank (1985) measure for changes in foreign assets held by domestic agents other than the banking system. It was further modified by Morgan Guaranty Trust (1986).

According to Morgan Trust (1986) capital flight is measured as:

$$KF(MORG) = \delta EXDEBT + G + F - N - I.....(2.3)$$

Where:

- KF (MORG) = Morgan Trust (1986) measure of capital flight
- I = Increase in Foreign Assets of the Domestic Banking System

G, F, and N are as defined in equation (2)

As usual in residual measures of capital flight, negative values of KF (MORG) are capital reflows while positive values are capital flight.

(iii) Bank Deposits Approach

The third approach to the definition and measurement of resident capital outflows involves measuring the increase in recorded foreign bank deposits of a country's residents. However, this is a controversial measure since even if there are statistical sources which distinguish between official and private holdings; it cannot be argued convincingly that all private funds held abroad are recorded by the relevant authorities. The difficulties in compiling the bank deposits data is compounded by the fact that some funds are deposited in bank which are not reported to the IMF or other relevant authorities while others may be held in non-bank foreign assets. Another problem arises from the desire of the depositors to conceal their nationality in order to minimize any potential risk they may perceive. Consequently, foreign bank deposits owned by a country's residents are likely to under estimate resident capital outflows.

(iv) Dooley Approach Method (1986)

The Dooley method defines capital flight as illegall capital outflows, or all capital outflows based on the desire to place assets beyond the control of domestic authorities. Following this concept of capital flight, the Dooley method considers all outflows that do not receive register interest payment as illegall capital outflows. The Dooley measure incorporates the net errors and omission, as well as the difference between the World Bank data on the annual change in the stock of external debt and debt flows as reported in the balance of payments statistics.

(v) Hot Money Approach

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

$$CF^h_t = STC_t - NEO_t \dots\dots\dots (2.4)$$

Where

CF_t^h = Hot money capital flight in a given time.

STC_t = Short-term capital outflows

NEO_t = Net errors and omissions

Studies that have applied this method include Cuddington (1986) and Khan *et al* (1987). One very important drawback of this method is that it fails to consider long-term capital outflows when capital flight is measured (Murinde et al., 1996). Against the background of its exception of “speculative” money, Ajayi (1992) argued that there is no justification for leaving out other parts of capital flight that can be considered as “speculative” money. However, for the purpose of this study, the operational definition and measurement of capital flight is in line with residual approach which defines capital flight as a net illegal outflow of capital from the countries of interest measured as the difference between sources and uses of capital inflows.

2.3 Theoretical Review

Over the years, the deteriorating impact of capital flight on economic growth and development has received increasing attention from researchers, economists, analysts and policy makers, especially, in the developing world. These various views have been categorized into various theories or hypotheses that explain capital flight. Some of these theories and hypotheses are examined below:

Portfolio-Choice Theory

This theory suggests that maximizing relative risk-adjusted expected return drives the choice between domestic assets and foreign assets (flight capital). The domestic determinants of relative expected return include risks, capital productivity, and their underlying determinants, notably the macroeconomic environment. The tax level determines net return to capital. Some researchers, including Ndikumana and Boyce (2003), Collier and Pattillo (2002), and Lensink et al (2000) report the debt stock to GDP ratio, which can be used to gauge future tax policy, as a significant positive determinant of capital flight. Ali and Bernard (2011) adopted a standard portfolio choice framework to explain the causes of capital flight from Africa. Based on this approach, Le and Zak (2006), Sheets (1995) and Ali and Bernard (2011) affirm that capital flight simply takes place in response to a deteriorating domestic investment climate where the risk-adjusted rate of return to investment is unfavourable.

External borrowing could provide the resources for capital flight while capital flight can also induce external borrowing by reducing tax revenues and foreign exchange. The institutional environment facing private investors affects capital productivity notably through transaction costs.

Bureaucratic corruption operates as a tax on investment. Exchange rate overvaluation induces devaluation expectations which could induce capital flight for hedging purposes. Ndikumana and Boyce (2003), Mikkelsen (1991) and Vos (1992) and others have reported path dependence in capital flight: High levels of capital flight could generate expectations of a rise in taxes to offset the ensuing decline in tax revenues. Income growth might impact positively on expectations of the return to investment. The flight capital base – the quantity of capital that could potentially flee the economy – also matters. This could depend on external resource inflows and income levels. Lastly, sometimes the motivation for capital flight may be safekeeping of embezzled funds especially under some kleptocratic (i.e. compulsive stealing) governments (Ndikumana and Boyce 1992,). Social unrest and crisis could stimulate capital flight directly by increasing political risk; and indirectly, through other variables that induce capital flight such as inflation and public debt termination/cancellation could reduce capital flight by reducing political risks and providing new investment opportunities. However, fears of war resumption could heighten perceived risks. Aid inflows could also provide resources for capital flight. War termination's effect on capital flight is therefore unpredictable. However, as peace endures, capital flight is likely to decrease as perceived risks diminish.

Corruption Theory

This theory considers corruption as the main factor encouraging capital flight. The proponents of this theory view corruption as a result of poor governance and weak economic bases (Quan and Meenakshi, 2006). The main thrust of this theory is that, without corruption there will not be capital flight and without capital flight, the problem of debt crises (Debt volatility and Dutch Disease Theories) and worsen economic condition will not arise.

The Volatility Theory

Various authors have accused aid and external debt of being volatile (Bulir and Hamann, 2003). Donors may be 'fickle', or due to the increasing use of governance conditionalities, relatively minor political events

may trigger coordinated interruptions in aid. To the extent that aid is volatile, it can increase capital flight in two different ways. Firstly, as it is well understood, macroeconomic volatility will tend to increase uncertainty and thereby reduce the risk-corrected returns on domestic investment. This will tend to increase the proportion of the wealth portfolio held abroad. This is not a phenomenon confined to developing countries, indeed it has recently been proposed as an important explanation for the relatively low rate of domestic investment and high rate of capital outflows even in the UK (Barrell and Weale, 2003). Secondly, aid volatility may induce capital flight for speculative purposes. If aid is perceived to be unsustainably high, as might occur for example in the aftermath of civil war, or during the political honeymoon of a donor-wise government, the real exchange rate will be temporarily appreciated. Private agents can take speculative advantage of this temporary price change both by purchasing durable imports and by shifting capital abroad. The standard analysis of capital flight allows for some exchange rate incentive by including the premium on the parallel market exchange rate as an explanatory variable. A high premium indicates a large and probably unsustainable subsidy for purchases of foreign exchange at the official rate and so provides a powerful incentive for capital flight. However, during a temporary influx of aid, the premium is likely to decline as official foreign exchange is more abundant, yet the incentive for flight remains.

As with the corruption theory, the volatility hypothesis has some limitations: First, some measures of aid volatility, (such as that of Bulir and Hamann (2003), measure aid in domestic currency. Since aid accrues as foreign exchange, such a measure can be badly contaminated by exchange rate variability. Second, the volatility of aid must be assessed in terms of its co-variation with other sources of revenue and foreign exchange. For example, even if aids were to be more volatile than tax revenue, it may nevertheless be revenue-stabilizing as long as it is not highly co-variate with tax revenues. Collier and Gunning, (1999) found aid to be essentially uncorrelated with tax revenue and thereby overall stabilizing. Were aid to be stabilizing, the volatility argument would be stood on its head, with aid reducing capital flight by virtue of raising the risk-corrected returns on investment. Third, even if aid was volatile to induce speculative capital

flight this might be something to be welcomed. Such capital flight would, by its nature, be temporary: private agents would be smoothing the ‘fickle’ behaviour of donors.

The Dutch Disease Theory

Another theory that explains the basis for capital flight is Dutch disease (Corden, 1984). It is well-understood that aid will tend to appreciate the real exchange rate and thereby reduce the profitability of the tradable sector. The non-tradable sector may offer relatively few opportunities for the investment of private capital. The capital-intensive parts of the non-tradable sector, such as power, telecommunications and transport, may be in the hands of the public sector (or foreign privatizations). The private part of the non-tradable sector may be informal and so unable to absorb bank financing, and in any case is likely to be highly labour-intensive. A remarkable apparent example of such a phenomenon is Nigeria following the oil boom of the 1970s, oil revenue being somewhat analogous to a massive inflow of aid. As a result of the massive influx of oil revenue, Nigerian non-oil exports collapsed, and even more remarkably private investment collapsed (Bevan, *et al*, 1999). Such a decline in the opportunities for domestic investment would tend to shift portfolio allocations abroad and so induce capital flight.

However, the Dutch disease theory has its limitations. As Bevan, Collier and Gunning (1999) show, Indonesia received much the same oil windfall but was able to expand exports rapidly and indeed attracted a large private investment inflow. The consequences of a foreign exchange windfall for capital flight might not follow automatically from Dutch disease, but rather depend upon the policy context. We should note that there is also a potential valuation effect arising from the appreciation of the real exchange rate. Flight capital is a foreign currency asset, whereas, domestic investment is a domestic currency asset. As the real exchange rate appreciates in response to aid then for a given configuration of assets flight capital will become relatively less valuable and so decline as a share of the portfolio. We abstract from this valuation effect by valuing domestic investment at international purchasing power parity prices, using the Penn World Tables.

The Public Investment Theory

While the first three theories have all implied that aid would increase capital flight, we now consider a theory by which it would have the opposite effect. The traditional view of aid was that it financed the ‘two gaps’ – savings and foreign exchange. As the scope for transforming output and consumption between tradables and non-tradables became better appreciated, the foreign exchange gap fell into abeyance, leaving the savings gap center stage: the role of aid was to finance investment. Once different roles are allowed for the public and private sector, the role of aid becomes further pronounced – it finances public investment, which in large part coincides with infrastructure. By the 1970s, this was probably the main conception of the role of aid. Although, the implications for capital flight were not considered, the link is relatively straightforward: aid should reduce capital flight because public and private capital is complementary. That is, the enhanced stock of public capital should raise the return on private capital and so reduce the incentive to shift portfolios abroad.

Some of the limitations of the public investment theory are that aid is now seen as fungible, so that it does not necessarily finance the public investment projects that are its ostensible purpose. Furthermore, the importance of public capital formation in the growth process has been questioned – it has come to be seen as wasteful rather than complementary to private investment (Devarajan and Swaroop, 2000).

The Portfolio Substitution Theory

The study on the effects of large, persistent aid inflows in “post-stabilization” countries where currency substitution is high suggests another theory whereby aid could reduce capital flight. A key feature of the Buffie *et al* (2004) model is that a portion of aid ends up reducing domestic budgetary financing rather than supporting an increase in government spending or a reduction in taxes. They show that, for example, in subSaharan Africa between 1990 and 2001, 21 cents of the aid dollar substituted, on the average, for domestic financing. A persistent aid inflow therefore reduces expected seigniorage and expected inflation. The fall in expected inflation is equivalent to a fall in the depreciation rate, i.e. the opportunity costs of holding domestic currency rather than foreign currency. With even relative modest portfolio substitutability, this triggers a portfolio adjustment generating an outright reduction in desired foreign balances, i.e. there is

a private capital inflow. The implication is that capital flight would fall or even turn from an outflow to an inflow, or repatriation of previous flight.

The limitations of the theory include; large increases in aid inflows may not be highly persistent for many countries, but rather short-lived and volatile, as noted above. In some countries, aid may be fully spent, rather than substitute for domestic financing with subsequent effects on long-run inflation, depreciation and portfolio substitution. However, the Buffie *et al* (2004) model does not consider aid that finances public investment. This type of aid brings many new effects into play. Portfolio substitution towards domestic currency and the private capital inflow could be strengthened by higher rates of return on private capital due to complementary public investment.

The Hypothesis of Contingent Effects

If both the public investment theory and, at least, one of the other theories are correct, then the net effect of aid on capital flight cannot be determined a priori. Collier and Dollar (2004) investigate the effect of aid on growth and on investment and find that the effects of aid are contingent both upon its volume and upon the policy environment. The volume effect follows from diminishing returns: beyond a certain level, aid ceases to raise growth and may begin to reduce it: Collier and Dollar term this the ‘saturation point’. In turn, the saturation point depends upon the policy environment. Collier and Dollar measure this using the Country Policy and Institutional Assessment of the World Bank, which is an annual rating of twenty different components of economic policy. Better policy increases aid absorption. They interpret their results as suggesting that aid has both favourable and detrimental effects such as might come about from the presence of both a public investment theory and a Dutch disease theory. With low volumes of aid and good policy the former theory predominates, so that aid enhances growth, and conversely, with high volumes of aid and poor policy Dutch disease predominates.

Collier and Dollar find that the saturation point is typically surprisingly high: in most aid-recipient countries, aid continues to be productive at the margin. While they do not consider the effect of aid on capital flight, their analysis has two implications for it. First, the effect of aid on private investment, and

hence on capital flight, would be contingent both upon its volume and upon policy. Second, in view of the high level of the saturation point, the normal case would probably be for aid to reduce capital flight. The concept of the saturation point is the point at which the marginal contribution of aid to growth is zero, carries over with modifications to the analysis of capital flight. One analogous concept is the point at which the net effect of aid on capital flight is zero. On one side of this point aid will be 'scaled-up' by private capital movements, on the other side it will be 'scaled down'. We might term this the 'no-scaling' point. A second analogous concept is the point at which capital flight is sufficiently severe that it fully offsets the inflow of aid: as a public dollar flows into the economy, a private dollar flows out. We might term this the 'full-offset' point.

The Marginal Income Theory

Here, the pure effect of aid as an augmentation to income should be considered. In the conventional analysis of capital flight, income is measured by GDP. This of course controls any output effects of aid, but misses the fact that aid permits aggregate expenditure to exceed aggregate production. Were there no other effects of aid, how would this affect portfolio choice? There are two reasons to expect that the marginal propensity to acquire assets abroad exceeds the average. The first is that domestic investment is subject to diminishing returns, whereas there are essentially constant returns to foreign investment. The second is that with higher levels of wealth, there is a stronger incentive to diversify the portfolio.

The above theories tend to explain why capital flight take the place in most developing economy. The above theories can be classified as either economic or political theory, while the Portfolio-choice theory and the debt Volatility theories are regarded as economic theories, Corruption and the Dutch Disease theory theories are regarded as political theories. However, the Portfolio-choice theory, Debt Volatility theory and the Corruption theory are relevant to this study. This is because studies on capital flight on developing economies suggest that both economic and political factors are responsible for the incidence of capital outflows from the domestic economies (Ojo, 1992, Ayadi, 2008 and Ajayi, 2005). Apart from these theoretical explanations, the study also relies on the residual estimation techniques of the World Bank and Erbe (1985) and that of Morgan Trust (1986) discussed under conceptual framework below.

2.4 Normal and Abnormal Capital Flows

There are various definitions of capital flight. The use of the term “capital flight” arouses strong emotions in some quarters. The controversy surrounding the term is due partly to the lack of a precise and universally accepted definition for it in economic theory and partly because of the way the term is used between developed and developing countries. It is usual amongst some economists to refer to capital outflow from developed countries as foreign investments while the same activity when undertaken by the residents of the developing countries is referred to as capital flight. One of the distinctions that are often made, however, is that exchange rate control regimes exist in many developing countries. One of the reasons for this dichotomy is the belief that the investors from developed countries are responding to better opportunities abroad. The investors from the developing countries on the other hand are said to be escaping the high risks which they perceive at home. This interpretation makes it very obvious why a lot of economists are “ill-at-ease” with the definition of capital flight. In general, it is believed that the investors from all countries, whether developed or developing, will base their investments decisions on the relative returns and risks of such investments at home and abroad.

There are possibly a number of valid reasons why capital flows from developing countries should be labeled as “capital flight”. The first is the general presumption in economics that capital should flow towards capital-scarce countries. There is scarcity of capital in developing countries. Any flows in the opposite direction, that is, from developing to developed countries as mentioned in the introduction are not only unusual but abnormal. The second reason is related to a policy issue. What is important is the extent to which those assets held abroad could be utilized at home to reduce the level of external indebtedness and relieve the inherent liquidity problems brought about by debt service obligations (Pastor 1990). In distinguishing between capital flight and normal capital flows, two broad approaches are taken in the literature. The first is an identification of specific episodes (or countries) that are characterized by abnormally adverse economic conditions for investment and consider all estimates of the acquisition of external claims that are not reported to the domestic authorities. On the other hand, capital flight can be

considered as those capital outflows which are in excess of “normal flows”. One problem with this definition lies in what constitutes “normal” capital outflows in this content (Anthony and Hallett, 1990).

These various difficulties essentially lie at the heart of the varying definitions and computation methodologies in which have been employed to quantify the capital flight phenomenon (Anthony and Hallett, 1990). Thus, the possibility of multiple definitional terms is one of the quandaries in this area in a sense and perhaps one of the strong points. One cannot but therefore agree with Chang and Cumby (1991) that there exists more than one viable definition of capital flight and the appropriate choice will depend on the policy question most pertinent on capital flight and the so called “normal” capital flows. Since illegal transactions are not reported, it is therefore not only difficult, but almost impossible to measure it as a component of capital flight. “Capital flight is capital that flees” (Kindleberger; 1987). Alternatively, capital flows in response to economic or political crisis are capital flight. Normal capital flows on the other hand, refers to flows that correspond to ordinary portfolio diversification of domestic residents. According to Cuddington (1986), capital flight refers to short terms private capital outflows. It involves “hot money” that responds to political or financial crisis, heavier taxes, a prospective tightening of capital or a major devaluation of domestic currency arising from high misalignment of the currency. In the Morgan Guaranty Trust Company (1986), an expansive definition is adopted. Capital flight is “the reported and unreported acquisition of foreign assets by the non-bank private sector and elements of the public sector”.

2.5 Capital Flight and Foreign Direct Investment

During the debt crisis of the 1980s, it was feared that providing external funds to cash-starved developing countries would be futile if a large part of the increased lending were to flow right back out as capital flight. An erosion of debt inflows by capital flight during this period is, indeed, confirmed by both Cuddington (1987) and Pastor (1990). In the 1990s, however, the main sources of external finance to developing countries are non-guaranteed private inflows; the most important among these is foreign direct investment.

Whether FDI inflows also facilitate capital flight or whether they inhibit it is a question generally examined from one of two perspectives? These perspectives are:

The Investment-Climate Perspective: From the investment-climate perspective, capital flight depends on the rate-of-return appeal of foreign as compared to domestic assets when adjusted for the exchange rate. The comparison is between returns attainable in the foreign country as opposed to those attainable at home; it is based on the location of the assets. Cuddington (1987) emphasizes this approach. Cuddington employs a standard three-asset portfolio-adjustment model using domestic financial assets, domestic inflation hedges (such as land and buildings), and foreign financial assets. He defines capital flight as the year-to-year increase in domestic holdings of foreign financial assets. Amounts allocated to the different assets depend on the domestic interest rate, the foreign interest rate augmented by the rate of expected depreciation of the domestic currency, and the domestic inflation rate. In addition, he includes foreign lending to the country as a factor explaining capital flight. Cuddington estimates his model using Ordinary Least-Squares (OLS) regressions. He then reruns the regressions after deleting the insignificant variables and adding a lagged dependent variable on the right - hand side. For Mexico, Cuddington finds out that foreign loan disbursements are a significant explanatory variable. In fact, the relevant coefficient value suggests that roughly \$0.31 of each additional dollar of new long-term loans to Mexico from 1974 to 1984 flowed back out in the form of capital flight.

In another empirical study that finds a similar relation between foreign lending and capital flight, Pastor (1990) runs OLS regressions of capital flight (scaled by exports) from eight Latin American countries from 1973 to 1986. He uses the usual variables (the rate-of-return differential between U.S. and domestic financial assets and the domestic inflation rate) augmented by the degree of over valuation of the exchange rate. Pastor (1990) analyzes the conclusions for robustness and searches for specification by adding one by one to the base regression the following structural (or real) variables: the ratio of net long-term borrowing to GDP (the capital-availability measure), the difference between the current year's and previous year's ratio of taxes to GDP, the difference between the country's growth rate and the lagged U.S. growth rate (as a proxy for relative profitability of investment in the domestic real sector—lagged because capital flight is

itself thought to affect growth), and labour's share of GDP for the previous year (on the hypothesis that increase in this share dampens profitability and encourages capital flight). He finds out that the ratio of net long-term borrowing to GDP is, at the 10 percent level, a statistically significant variable explaining capital flight

The Discriminatory Treatment Perspective does not relate capital flight to the usual determinants of net international capital movements, such as international-yield differentials. It highlights, instead, the fact that host countries often favour non-resident investment (and, by implication, discriminates against resident investment) in the form of differential taxation, investment or exchange-rate guarantees, and priority over resident claims in the event of a financial crisis.

It is this discriminatory treatment, and the resulting differences in the actual or perceived risk by residents and non-residents in holding claims on residents, that explains capital flight. This approach has been used by Dooley (1986), Khan and Ul Haque (1987), Eaton (1987), and Rojas-Suarez (1991), among others. Their models and analyses are briefly described below. Khan and Ul Haque (1987) start with the standard intertemporal optimizing model of external borrowing and investment. At the beginning of the first period, households are endowed with a stock of domestic capital; this is used up during the first period and is transformed into output. The household may consume the first period's output; it may also invest that output, either at home or abroad. Investment abroad is risk free. Foreign borrowing is allowed, but it may be used only for domestic investment and may not be repudiated. Domestic uncertainty is also permitted in the form of the possible expropriation of the domestic firm and its debt obligations with no compensation offered to the domestic owners of the expropriated assets, or, equivalently, domestic instability that reduces the firm to bankruptcy. Khan and Ul Haque (1987) show that positive values for both domestic and foreign investment are possible because of this uncertainty, even with positive levels of debt accumulation. Foreign lenders lend to the country because foreign debt may not be repudiated. At the same time, the risk of expropriation or of bankruptcy in the home country encourages capital flight.

Eaton (1987) builds on this work by first emphasizing that the risk of expropriation may also mean the threat of high levels of domestic taxation in the future. In addition, because foreign lenders generally have little ability to assess the solvency of a particular private borrower in a developing country, at least relative to the ability of the government of that country, loans for private borrowers may be channeled through the government, or lenders may require that such loans be guaranteed by the government of the borrower. In contrast to Khan and Ul Haque, Eaton allows for the possibility that borrowers may invest borrowed funds abroad (foreign lenders may not, however, use these deposits as collateral against outstanding loans). The potential national takeover of private debt encourages a low level of effort by borrowers to service their debt and may even induce outright fraud. Because one borrower's default increases the expected value of the future tax obligations of other borrowers, the other borrowers' incentive to repay their debt diminishes and their incentive to place their funds abroad increases. Capital flight thus becomes contagious.

Dooley (1990) also uses the differences in the guarantees given by governments to foreign and domestic investments to explain the differences in the perceptions residents and non-residents have regarding the risk-adjusted returns for claims held on residents. For non-residents, the risk of default is the main concern. For residents, default is of less concern, because contracts between residents are better protected by the country's legal system than the contracts between residents and non-residents. Fears of domestic inflation and exchange – rate depreciation, however, are of greater importance to residents than to non-residents. Nonresident claims on debtor countries are typically denominated in foreign currencies, and although this fact alone does not make them immune to inflation and exchange-rate risk, they are less affected by these factors than they are claimed by residents. Rojas-Suarez (1990) also refers to government guarantees to explain the simultaneous flight of capital from small and large foreign loans to developing countries during the 1970s and early 1980s. She explains, in addition, that the debt crisis of the mid-1980s reduced, and perhaps eliminated, differences in risks faced by residents and non-residents, so that domestic debt was no longer considered “junior.” The Hypotheses as Lessard and Williamson (1987) point out, the investment-climate perspective cannot explain the simultaneous movement of capital into and out of the country. By this explanation, capital flight depends on the attractiveness of foreign as compared to domestic assets—

once the rate of return is adjusted for the exchange rate. Assets in the host country are either more or less attractive than assets in the foreign country, so that flows in both directions do not occur. The discriminatory-treatment perspective, however, can explain simultaneous flows. In fact, this explanation was specifically put forward to explain the coexistence of private foreign lending (implicitly or explicitly guaranteed by governments) and capital flight.

As remarked above, the major capital inflow to developing countries in recent years has not been international lending, but private foreign investment, in which the foreign investor faces the additional risk of variability in the nominal value of his return. The factors affecting international lending, however, are also applicable to private foreign investment. Both foreign lenders and investors find it difficult to assess the solvency (or profitability) of a particular private borrower (or project) in a developing country, and both are subject to a far greater risk of market failure resulting from the relative non enforceability of contracts for foreign as compared to domestic lending or investment. Private foreign investors (as well as foreign lenders) may therefore require that their investments be guaranteed or at least be favourably treated by the recipient's government. Many developing-country governments do, as mentioned, offer private investors favourable treatment in the form of differential taxation, investment or exchange-rate guarantees, or priority over resident claims in the event of financial crisis. Generally, rather than borrowing themselves from the private external market, governments give implicit or explicit guarantees to borrowings by private entities. As discussed above, Eaton (1987) argues that by guaranteeing external, but not internal, borrowing, governments encourage round trip flows in the form of capital flight the investment-climate perspective suggests that capital flight ought to decrease if the investment climate improves and foreign direct investment increases; the relationship between FDI inflows and capital flight will therefore be negative. If, however, foreign direct investment is the result of preferential treatment given to foreign as compared to domestic investment, FDI inflows will likely be accompanied by continued and accelerated capital flight; the relationship between the two will therefore be positive.

If the discriminatory – treatment view over-rides the investment - climate perspective and FDI inflows occur, a capital inflow of one kind will be accompanied by an outflow of another kind, so that the net effect of the inflow will be minimal. In this event, specific policies, such as tax amnesties or treaties, the offering of domestic instruments denominated in foreign currencies and capital-control programs may be needed to restrain outflows of capital and to induce repatriation of flight capital. If the investment-climate explanation is dominant, however, and the relation between capital flight and FDI inflows is negative, the policies that stimulate investment in general will also entice flight capital to return and capital flight to decrease, so that the effect of FDI inflows on the economy will be magnified. Although, this question has important policy implications, it has not been studied in the literature. Numerous studies have analyzed the relation of foreign direct investment to real variables such as technology transfers and exports, but there have been virtually no inquiries into the financial or monetary effects of foreign direct investment (Kant,1996) discusses only its fiscal or budgetary effects). Because many developing countries are only now emerging from the debt crisis (partly caused by capital flight) following the 1978–81 boom in commercial bank loans, their wariness regarding the short- and long-term financial implications of the current spurt in private FDI (as well as portfolio) investment is not surprising. This study attempts to determine whether such inflows themselves facilitate capital flight or whether they reduce it.

2.6 Foreign Lending and Capital Outflow

The estimations of Gajdeezka and Oks (2009) show a very strong correlation between capital outflows and foreign lending. However, they believe that the high correlation does not necessarily reveal conclusive causality linkages in either direction. They argued that the nature of the relationship between net lending and capital flight has changed over time. They also discussed the relationship between net lending and capital flight in the context of risk asymmetric and scarce investment opportunities in developing countries. Their estimates revealed a close relationship between foreign lending and capital flight. During the 1980-1987 period, the total value of capital outflow from highly indebted countries (HICs) was \$84 billion and which corresponded to roughly 40% of the total net long term resource inflows to these countries in the group of high capital flight countries (Argentina, Brazil, Colombia, Mexico, Nigeria, Peru, Philippines and

Venezuela), for each dollar in net lending, approximately 60% was expatriated as capital outflows. They argued that this is an important observation given that foreign lending was a major source of exchange reserves financing and that these reserves were a source of foreign exchange for capital flight. They added that the correlation between foreign lending and capital out flows can be explained in several ways. Prior to 1982, the most straight forward explanation is that governments borrowed to replenish foreign exchange reserves and thus enabled capital outflows. External lending and capital showed when voluntary lending to developing debtor countries stopped in 1982.

However, they observed that the linkage between capital flight and borrowing changed after the outbreak of payments difficulties in 1982, in particular the large foreign debt meant that foreign creditors faced much higher levels of risk than before. They explained that the disbursement of additional loans was made condition in the implementation of policies which by themselves required less external funding. Therefore, the resulting contraction in lending by 1986 was accompanied by the conspicuous reduction in capital flight. On this note, Gagdeezka and Oks suggested that the decline in capital outflows until 1986 was achieved by better economic policies negotiated in conjunction with lower borrowing requirements and the imposition of capital controls.

2.7 Domestic Policy Distortions, Debt Accumulation and Capital Flight in Nigeria

Domestic policy distortions were an integral part of the growth and stabilization policies pursued by most Latin American countries. Policy distortions led to a loss of government's credit-worthiness, exchange rate over valuation and financial instability, which in turn generated incentives for capital flight (Adegbite and Ayadi, 2008). These factors are examined below:

(i) Loss of Credit Worthiness

During the 1970s, governments of large Latin American countries for example pursued expansive fiscal and monetary policies associated with relatively fast rates of growth and received massive financial support from foreign commercial banks. Foreign lending helped avert the short-term inflationary consequence of large domestic deficits but as foreign debt accumulated, both the foreign and domestic credit worthiness of these governments was impaired. As the internal perception of government's solvency deteriorated, thus

raising inflationary risks and devaluation expectations, even extremely high interest rates could not prevent capital flight. The reason was that the risk involved in holding domestic debt grew faster than their nominal interest rate and when corrected for risk factors (including unexpected devaluation risk) foreign asset remained a better choice capital flows in and out of a country arbitrated differentials between these risk-adjusting domestic and foreign rates of return.

(ii) Exchange Rate Over-Valuation

Exchange rate policy was often aimed at fighting inflation rather than at preventing future balance of payments difficulties. For example in Argentina, Chile and Uruguay, a pre-announced path of decreasing exchange rate devaluations was deliberately enforced to contain inflation. These policies, which were conducted without controls on capital movements, were facilitated by favourable terms of trade, low real foreign interest rates and massive foreign lending. These anti-inflation policies led to exchange rate over valuation and fueled capital outflows as speculators brought foreign assets when the real exchange rate became unsustainably overvalued. In this way, central banks financial capital flight, thus re-channeling abroad a substantial portion of foreign lending to governments, with controls on capital movements unlike in the open capital account situation described above, currency over-valuation is reflected in a premium, the black market offers above the official exchange rate. This tends to raise the unofficial surplus, an alternative source of capital flight, because the black market premium creates an economic incentives for smuggling, export under-invoicing, import-over-voicing and unofficial trade transactions related to tourism. Capital flight through smuggling and under-voicing of exports is also induced by export taxes or in the case of drugs by legal restrictions. On the other hand, import tariffs induce import under-invoicing (as importers seek to avoid trade taxes) that tends to reverse capital flight.

(iii) Financial Instability

Although, financial instability was partly a consequence of fiscal deficits and exchange rate policies, in many countries it was also a by-product of financial repression, that is, interest rate fixed below inflation rates, high legal reserve requirements of banks the other institution rigidities imposed on financial systems. Financial repression encouraged capital flight both by lowering returns on domestic investments and feeding

overall financial instability, for example, through its potential impact on financial disintermediation when inflation rises.

In countries with more liberal financial systems, for example with market determined interest rates, large fiscal deficits and exchange rate over-valuation resulted in high real domestic interest rates thus creating a different type of financial instability as firms and governments became highly indebted domestically. Domestic firms that took advantage of relatively cheap foreign credit experienced financial instability after corrective devaluations were implemented. Financial instability also activates what can be regarded as a secondary source of capital flight – the stock of assets held by residents abroad. Financial instability induced foreign asset holders to reinvest abroad the returns on their assets such as interest, dividends and capital gains. While policy distortions tend to have an immediate effect on capital flight, reversing them may only have positive results in the long run. In the short-run, trade and fiscal reforms may promote rather than reverse capital flight as they pose a threat to heavily protected sectors, privileged tax loopholes and tax evasion. However, a substantial reduction of fiscal imbalance could accelerate the beneficial effects of removing other policy distortions.

2.8 Basis for Capital Flight

The causes of capital flight are many; these various causes can be grouped under relative risks, exchange rate misalignment, financial sector constraints and/or repressions, fiscal deficits and external incentives and disbursement of new loans to LDCs (Cuddington, 1987). These are no doubt economic causes of capital flight. There are, however, other non-economic causes which though important are often ignored. These include the corruption of political leaders and extraordinary access to government funds. Some of these factors are now discuss below:

Investment Climate

A poor domestic investment climate will affect the returns of domestic held assets while a good and favourable domestic environment will boost the returns on dometically held assets. A favourable domestic investment climate will encourage capital inflows and a poor domestic investment enmvironment will

encourage capital outflows. Various factors in turn affect the condition of the domestic environment. These include (Ali and Bernard Walters, 2011)

(i) Risks and Return Features

The relative riskiness and profitability of domestic investments will determine whether or not capital will flow in or out of an economy. In decision making process, the wealth holder looks at the various risks confronting him. There are certain inherent characteristics of developing countries which make risks attached to investments larger than those of developed countries. An increase in risk in a rational expectation setting would tend to increase the outflow of private capital from the domestic economy into foreign countries where investment is less risky. Thus, domestic investors will prefer to transfer funds and hold foreign assets (Hermes and Lensink, 2001; Cerra *et al*, 2008).

(ii) Policy Distortions

The specific macroeconomic policies a country pursues will directly affect the domestic climate. Macroeconomic instability such as high and volatile inflation rate will erode the real value of domestic assets and this will result in lower economic growth and lower returns to the investors. Apart from this currency, overvaluation has also been suggested as one important variable that is responsible for high rate of capital outflows from a country. This is because currency overvaluation will result in lower economic growth, higher probability of speculative attacks, increase current account deficits, shortage of foreign exchange, balance of payment crises and corruption (Frait *et al* 2006, Rodic, 2008)

(iii) Institutions and Political Instability

Good quality financial institutions are very vital to ensure favourable domestic investment climate. The study of Acemoglu and Robinson 2001, Acemoglu *et al* 2005 show that institutions directly affect whether investors will engage in productive investments or not. Hence, the decision to invest locally or not depends on the availability or otherwise of investment-friendly financial institutions in the economy (North, 1990).

(iv) Exchange Rate Misalignment

The importance of this variable has amply been demonstrated in several empirical analyses including the studies by Dornbusch (1985), Cuddington (1986), Lessard and Williamson (1987) and Pastor (1989, 1990).

The real exchange rate plays a significant role in the direction and magnitude of capital flight from highly-indebted developing countries. Under normal circumstances, if a currency appreciation is expected, domestic wealth owners would shift out of domestic assets into foreign assets. In general, it is difficult to measure precisely exchange rate expectations. It is safe, however, to assume that if a currency is overvalued, economic agents would expect the currency to be devalued in the future. Holding firmly to this expectation would cause residents to avoid the potential capital loss by converting into foreign claims.

(v) Financial Sector Constraints

This can also lead to capital flight. It is well known that narrowness of the capital and money market is a feature of developing economies. Financial markets in these countries provide only a limited variety of financial instrument in which wealth can be held. There is also in many developing countries the lack of full or credible deposit insurance on assets that are held in the domestic banking sector. This deficiency is, however, being increasingly remedied by many developing countries. Additionally, there are extensive controls on interest rates and on other aspects of financial market behaviour in developing countries. Government policies in the financial sector have resulted in normal interest rates that are far below the rates on comparable foreign financial instruments. In most cases, the real rates of return on domestic financial assets are negative.

2.9 The Structural Adjustment Programme

The years in the 1980s witnessed steady economic deterioration and seemingly faulty economic policies. At the beginning of the 1980s, the country had entered into difficult times. Scarcity of foreign exchange had set in. By the mid-1980s, reality had dawned on the nation's economy. Retrenchment of workers was rampant in both private and public sectors. There were inflation, very high levels of unemployment affecting both skilled and unskilled workers, and low levels of plant capacity utilization. The origin of the socio-economic difficulties was generally traced to the global economic recession which opened with the decade of the 1980s. Earlier, these socio-economic problems had forced the Federal Government of Nigeria, under President Shehu Shagari, to embark on an economic stabilization programme (Aboyade, 1974, Adegbite *et al*, 2008).

The problems of performance of the public sector enterprises in Nigeria were further complicated by the downturn in socio-economic development in the country due to the global economic recession and the collapse of the oil market. Thus, Nigeria's precarious fiscal and monetary posture could no longer sustain the requirements of its public sector enterprises, particularly, since they performed below expectations in terms of their returns on investments and quality of services. Towards the end of 1980s, the public enterprises, which had grown too large, began to suffer from fundamental problems of defective capital structures, excessive bureaucratic control and intervention, inappropriate technologies, gross incompetence, and blatant corruption. With the deep internal crises that included high rates of inflation and unemployment, external debt obligations, and foreign exchange misalignment, Nigeria and many other African countries were strongly advised by the worldwide lending agencies, particularly, IMF and the World Bank, to divest their public enterprises as one of the conditions for economic assistance. With the intensified push for economic liberalization, Nigerian and other African leaders were told that privatization as an economic reform would help cut public sector inefficiency and waste, provide greater scope to the private sector, attract more investments, bring in new technologies, and hence revive economic growth. Thus many countries, including Nigeria, embarked on privatization and other market oriented reforms to pull them out of the structural imbalances (Nwoye, 1997).

It is against this background that the Structural Adjustment Programme (SAP), proposed a kind of reform which would affect the goals, administration, and management of most of the public sector enterprises for purposes of efficiency (Federal Republic of Nigeria, 1986). The major objective of SAP was to boost economic growth by enhancing domestic production. This was to be done through deregulation and privatization of main economic sectors by the removal of subsidies, reduction in wage expenses, and retrenchment in the public sector ostensibly to trim the state down to size. However, the Structural Adjustment Programme could not achieve the set objectives not only because of the conditionalities of the creditors but also because of various political and economic challenges in the country. These challenges have led to the massive outflow of domestic capital to other countries of the world with more stable economies.

2.10 Review of Empirical Studies

By its very nature, it is difficult to measure capital flight. The difficulties involved notwithstanding, a number of capital flight estimates have been made over the last several years. The proponents of these studies cover a number of countries, including Argentina, Brazil, Chile, Korea, Mexico, Peru, the Phillipines and Venezuela. Studies by Chang and Cumby (1991), Hermes and Lensink (2000), Ojo (1992), Nyatepe-Coo (1994), Ajayi (1997), Ndikumana and Boyce (1998, 2003), Boyce and Ndikumana (2001), and Mohamed and Finnoff (2004) concentrate on the estimation of capital flight from different African countries. Chang and Cumby (1991) studied 36 African countries during 1976–1987 and found that the amount of capital flight in terms of gross domestic product (GDP) exceeded that of Latin America countries. The amount of capital flight was calculated by Hermes and Lensink (1992) for the period between 1976 and 1989 for six African countries.

They concluded that Nigeria experienced the largest amount of capital flight with most of it taking place via public external borrowing. Ojo (1992) calculated the amount of capital flight from Côte d'Ivoire, Morocco, and Nigeria for 1975–1991 and attributes it to changes in external reserves and governmental budget deficits. Capital flight from 1970 to 1992 was estimated by Nyatepe-Coo (1994) for seven sub-Saharan African countries. The results showed that the amount of capital flight from Nigeria, Ghana, Congo-Zaire, and Zambia were 91, 58, 35, and 32 percent of external borrowing, respectively. This study linked the results to the unreliability of the governments' actions in terms of capital expenditures. Trade misinvoicing can be an important factor in the calculation of capital flight. Rustomjee (1991), Wood and Moll (1994), Boyce and Ndikumana (2001), Mohamed and Finnoff (2004), and Almounsor (2005) estimates and include trade misinvoicing in their calculations of capital flight from Africa with different results.

A study by Rojasuarez (1991) covers Argentina, Bolivia, Chile, Columbia, Ecuador, Gabon, Jamaica, Mexico, Nigeria, Peru, the Philippines, Venezuela and Yugoslavia. These various studies differ from one another in terms of the methodological approaches of measurement, country coverage and lifespan. The most significant of these studies which have made impact on capital flight estimates include the studies by Dooley (1986), (1986), Worldbank (1985), Morgan Guaranty Trust Company (1986), Cuddington (1986),

Cumby and Levich (1987), Lessard and Williamson (1987), Khan and UI Haque (1987) and Verna – Schneider (1991). In the Cuddington (1986) approach, capital flight is defined as a short term speculative outflows which according to him is the typical meaning of capital flight. It is defined as short term external assets by the non-bank private sector plus the errors and omissions in the balance of payments. This approach is concentrated on what is popularly referred to as “hot money flows” method because of the fact that funds are expected to respond quickly to changes in expected returns or to changes in risk. Variations in economic conditions are likely to affect the magnitude of such flows. These in essence are funds “on the wings” that are expected to return very quickly to the country of origin when economic conditions are favourable, that is, when appropriate macroeconomic policy stance is adopted.

Khan and UI Haque (1987) calculate capital flight for eighty highly-indebted developing countries for the period 1974 and 1982. Accordingly, they defined Capital flight in two ways: first, it is defined simply as gross private short term capital flows plus net errors and omissions in the country’s balance of payment accounts. This is the same as the Cuddington estimate. The second method tries to take account for normal capital flows. Capital flight is defined as that part of the increase in external claims that yields no recorded investment income; this in essence is the Dooley (1986) approach. Cuddington (1986) also estimates the economic determinants of resident’s capital outflow of four countries (Argentina, Mexico, Uruguay and Venezuela). His empirical findings differ from country to country. In Mexico, capital flight was highly related with over-valuation of the exchange rate, while in Venezuela, there were over-valuation and foreign interest rates. In Argentina and Uruguay it lagged effective exchange rate and error of the model were related to capital flight. Conesa (1987) has similar results except that it has 16 annual observations while Cuddington (1986) has 91. Conesa (1987) has growth as an additional explanatory factor and does not attempt to estimate over-valuation of the real or effective exchange rates but uses level of government borrowing in his study of seven developing countries (Argentina, Mexico, Brazil, Chile, Peru, Venezuela and Philippines). Dooley (1986) discovers that capital flight is significantly related to domestic inflation, financial repression and a measure of country risk premium.

Chang and Cumby (1991), in their sample of 36 African countries discovered that, with the exception of Nigeria, the absolute levels of capital flight from the individual African countries were smaller than Latin American countries. But in relation to external debt and Gross Domestic product (GDP) many African countries experienced higher capital flight than their Latin American counterparts. Hermes and Lensuk (1992), estimate capital flight from six-sub-Saharan African countries (Congo, Zaire, Cote d'ivoire, Nigeria, Sudan, Tanzania and Uganda) from 1976 to 1989, using their estimates, capital flight may seem small compared to Latin American countries but the burden as a percentage of GDP is higher by 61% of sub-Saharan compared to 22% for Latin American. Also, by their calculation, Murinde and Lensink, (1996) discover that Nigeria experienced the biggest capital flight over the period with \$21billion representing 60% of the combined total of the six countries in the sample. Their econometric analysis of the determinant of capital flight indicated that the most explanatory variable is public external borrowing. The results implied that capital flight and external debt are closely dependent.

In the study of three countries (Cote d'ivoire, Nigeria and Morocco,), Ojo (1992) opines that Nigeria had the largest capital flight of \$35billion and emphasizes the importance of domestic economic environment including policy related variables as government budget deficit and changes in external debt. Ajayi (1992) discovers in his study that cumulative capital flight in the period of 1980 to 1991 averaged 40% of external debt to run 18 countries sampled. The ratio was as high as 94% for Nigeria, 74% for Kenya and 60% for Sudan. He also discovers that countries that exhibited the greatest capital flight often are the most highly indebted and referred to them as "twin problems". Ajayi (1992) estimates capital flight from Nigeria in 1972 to 1989, drawing attention to the role of "trade faking" (misinvoicing) in the country's oil sector and to the link between capital flight, corruption and governance failure. He concludes that most of the capital flight from Nigeria is recorded in the BOP and debt statistics and that is not only explained by economic factor but also political factor or uncertainty. Owiodukit (2007) in his study states that the major determinants of capital flight from Nigeria are domestic inflation, availability of foreign exchange reserve,

comparative growth rate of the economy and parallel market premium. Using empirical evidence of the magnitude of capital flight from debtor countries in the 1980s, Gaydeezka and Oks (2009) of the IMF and the World Bank respectively looks for satisfactory explanations of this phenomenon. The study argues that the nature of capital flight pre-1982 can be explained by poor domestic policies resulting in adverse economic incentives for domestic investors and facilitated by large inflows from foreign creditors. The authors then search for an explanation for the resurgence in capital flight since 1986, and argue that debtor governments not only lost external credit worthiness (in 1982-1983) but have now also lost domestic credit worthiness. As confidence in governments has been eroded, the perceived risk of domestic assets rises and residents have sought to diversify through investing abroad. While this still continues at the core of the problem of capital flight, the authors also looked at several other explanations of the problem, for example, continuing policy distortions, debt overhang and uncertainty over debt negotiations.

According to the authors, large capital flows out of developing countries have ample evidence of high capital mobility between LDC's and the outside world and of private capitals stronger responsiveness to changes in both domestic and foreign economic incentives. They also hold the view that because LDC governments largely ignored capital mobility and allowed policy distortions to persist, capital flight continued until external credit was denied and some corrective measures were undertaken. They concluded that the price LDCs paid for capital flight was already high. They argued further that massive foreign lending played instrumental role in facilitating private capital outflows and that the deeper roots of capital flight is traceable to their economic disincentives created by domestic policy distortions. They observed that the decline in outflows from the early 1980s through 1986 can be ascribed in part to the correction of some distortions, such as the reduction in exchange rate. The study by Ajayi (1997) provides a link between capital flight and external debt in Nigeria. He concludes that most of the capital flight from Nigeria is recorded in the balance of payment and debt statistics and that capital flow is explained not only by economic factor but also political instability.

Econometrics studies on Africa seem to suggest that capital flight results mainly from macro-economic mismanagement, especially, domestic inflation. Ng'eno (1994) for example, finds capital flight to be

positively correlated to domestic inflation and lagged capital flight. Olopoenia (1995) study for Uganda shows unsatisfactory results. In fact the R^2 was less than 0.30. The explanatory power in Olopoenia (1995) raises concern on the difficulty of estimating capital flight in African countries which arises mainly from poor quality of data.

The poor results of empirical studies on capital flight from Africa may not be unconnected to the use of estimated statistics of capital flight as a dependent variable. Attempts to empirically determine the factors that affect an estimated statistics on capital flight is suspected and is bound to produce spurious results, as none of the methods of estimation discussed can capture the very nature and character of the developing countries, including Nigeria. The relative under developed nature of statistical gathering, as well as, the very nature of the applied concept of capital flight makes the adoption of any model developed for the industrial economies for the purpose of measuring capital flight in the developing country like Nigeria, irrelevant. In the light of the above, and given the earlier discussion on the consequences of capital flight on the economy, which cannot be separated from the impact of genuine capital movement, I adopted for this study the Gross Domestic Product as the dependent variable in model 2, 5 and 6. In an alternative model, I adopted the Gross Domestic Product as proxy for the dependent variable. Ng'eno in (1994) the use of the three capital flight estimate model in Nigeria since illegality of the so-called "capital flight" cannot be modeled.

As noted earlier, the only known empirical study on capital flight in Nigeria is that of Ajayi (1992). However, the author did not test for unit roots in the regression models before running the econometrics model with the variables in levels. In order to avoid spurious regression, the author should have first established the levels of the variables. In addition Ajayi (1992) empirical work was based on estimated capital flight figure as the dependent variable. The problem of attempting to determine the determinants of an estimated dependent variable is very obvious as the result of the regression can best be interpreted with caution. To adequately take care of the shortcomings of Ajayi (1992), based on the problems identified with the previous methos, he tested for statistical properties of the variables used in six formulated models, as well as, use firm figure of capital outflow as a proxy for capital flight, the reason for this has been adumbrated earlier. A study on econometric analysis of capital flight in Nigeria by Ayadi (2008)

investigates the determinants of huge capital flight (with its constraints on economic growth) so as to make meaningful policy contributions on strategies of minimizing capital flight and its attendant impacts. His study investigates the linear determinants of capital flight in Nigeria utilizing the Ordinary Least Squares (OLS) and the Error Correction Mechanism (ECM). The study found among other things, the validity of the portfolio theory which postulates how risk-averse investors can build portfolios in order to optimize or maximize expected returns given a level of market risk. This is confirmed in the international realm as private sector engaged in international arbitrage. Capital flight is caused by the interest rates differential both in the short and in the long run. In addition, exchange rate depreciation significantly increases capital flight in Nigeria. Output growth which measures the domestic opportunity cost of flight in Nigeria is negative and significant in the short-run indicating that nonperformance of domestic resources can trigger capital flight.

De Boyrie (2011) in his study of the determinants of capital flight and capital movement through trade mispricing in African countries attempts to accomplish two things. First, it tries to establish the determinants of capital flight and capital movement through trade misinvoicing from selected African countries in order to ascertain whether the same factors could explain both types of capital movement. Second, it attempts to determine whether Granger causation exists between capital movement through trade misinvoicing and capital flight. Data for selected countries were combined into geographical, economic, and monetary regions using, 21 explanatory variables, the results showed that variables that explain capital flight do not always explain capital movement and vice versa. The independent variables tended to explain the dependent variables in a few cases, implying that the reason for capital flight and capital movement was other than for investment purposes. Overall causality was found to exist between the dependent variables, mostly in the form of feedback. Yet, the relationship was mostly transitory with a long-term relationship existing in only few cases.

Ali and Walters (2011) investigate the causes of capital flight from Sub-Saharan Africa. The study drawing on insights from portfolio theory, presents empirical evidence that links capital flight to the domestic investment climate. Using a panel data set for 37 African countries over the 1980-2005 period, the study

finds out that once account is taken of the region's structural and institutional features, private capital outflows from Africa are explained by policy distortions, long with the relative riskiness and poor profitability of investments. In addition, the study finds evidence that the type and composition of resource flows to the region are important for capital flight: foreign aid generally discourages capital flight while short term borrowing and FDI contribute to it. The findings of the paper are robust to endogeneity, outliers, sub-samples, and to different econometric methods.

2.11 Summary of Literature

The implication of the above empirical and literature review is that capital flight is prevalent in Nigeria and various economic and political factors are responsible for the occurrence. Specifically, the literature review reveals that findings from existing theoretical and empirical studies on capital flight suggest that both economic and political factors are responsible for the incidence of capital outflows from the developing economies to the developed economies. However, most studies on the Nigerian economy concentrate more on the economic determinants and effect of capital flight while very few studies consider the correlation of political regimes/ political uncertainties with capital flight. Again, recent occurrence of Financial institutions instability reveal that institutional factors could play a very critical role in stemming or boosting the incidence of capital flight from the domestic economies of developing nation, however, there are not many empirical evidence of this in Nigeria. Thus, the research fills a crucial gap in literature in that it examines the economic, political and institutional determinants of capital flight in Nigeria as well as the effect of these variables on the economy in order to provide reliable empirical evidence.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The primary objective of this research work as stated in chapter one is to investigate the effects of capital flight on Nigeria's economic growth between 1970 and 2011. In order to effectively realize the objectives of the study, relevant variables were adopted to measure the time series characteristics of the variables in the models. The study is empirical and analytical in nature; it is an ex-post factor research in that it relies heavily on already computed data. The variables adopted are Gross Domestic Product (GDP), Capital Flight (KF), Gross Capital Formation (GCF), Direct Foreign Investment (DFI), Current Account Balance (CAB), Inflation Rate (INF), Degree of Openness (DOP), Change in External Reserves (δ RES), Deposit Rate (DR), Credit to Private Sector (PRIVCR), Interest Rate differential (USIRD), Government Current Expenditure (GOCE), Change in External Debt (δ EXDEBT), and Change in Foreign assets held by domestic banks (δ NEXTAS). Two models with each consisting of two equations were formulated to test the determinants and effects of capital flight on the Nigerian economy between 1970 and 2011 while four other models with each consisting of two equations each were formulated to test the determinants and effects of capital flight on the Nigerian economy in the Pre and Post SAP era. The two equations under each model represent the World Bank and Erbe (1985) approach and the Morgan Trust (1986) approach of the residual method respectively. In model 1, Capital Flight (KF) is the dependent variable while Gross Domestic Product is the dependent variable in model 2. In the same vain, Capital Flight (KF) is the dependent variables in model 3 and 4 while Gross Domestic Product is the dependent variables in model 5 and 6. Major macro economic variables such as the degree of openness (DOP), inflation rate (INF), gross capital formation (GCF), change in external debt (δ EXDEBT), change in external reserve (δ RES), deposit rate (DR), credit to private sector (PRIVCR) and foreign asset of domestic banking system (δ NEXTAS) stand for the independent variables in models 1, 3, and 5 while change in External Debt (δ EXDEBT), Direct Foreign Investment (DFI), Current Account Balance (CAB), change in External reserve (δ RES) and

change foreign asset of domestic banking system (δ NEXTAS) are the independent variables in models 2, 4 and 6.

The residual approach which the study employs was developed by the World Bank and Erbe (1985) and later modified by Morgan Guaranty Trust (1986). The Morgan Trust version arose out of the feelings that the balance of payments account was not sufficient to estimate resident capital outflows. The World Bank and Erbe (1985) version regard capital flights as the difference between sources and uses of capital inflows. Capital inflows are increases in external debt/foreign aid and foreign direct investment which are being used in financing current account deficits or increase in official reserve. From the variables, deposit rate, credit to private sector and change in foreign asset of domestic banking system represent institutional factors while government expenditures and debt volatility due to political crises and instability represent political variables. The remaining variables are the macroeconomic variables.

3.2 Research Instrument

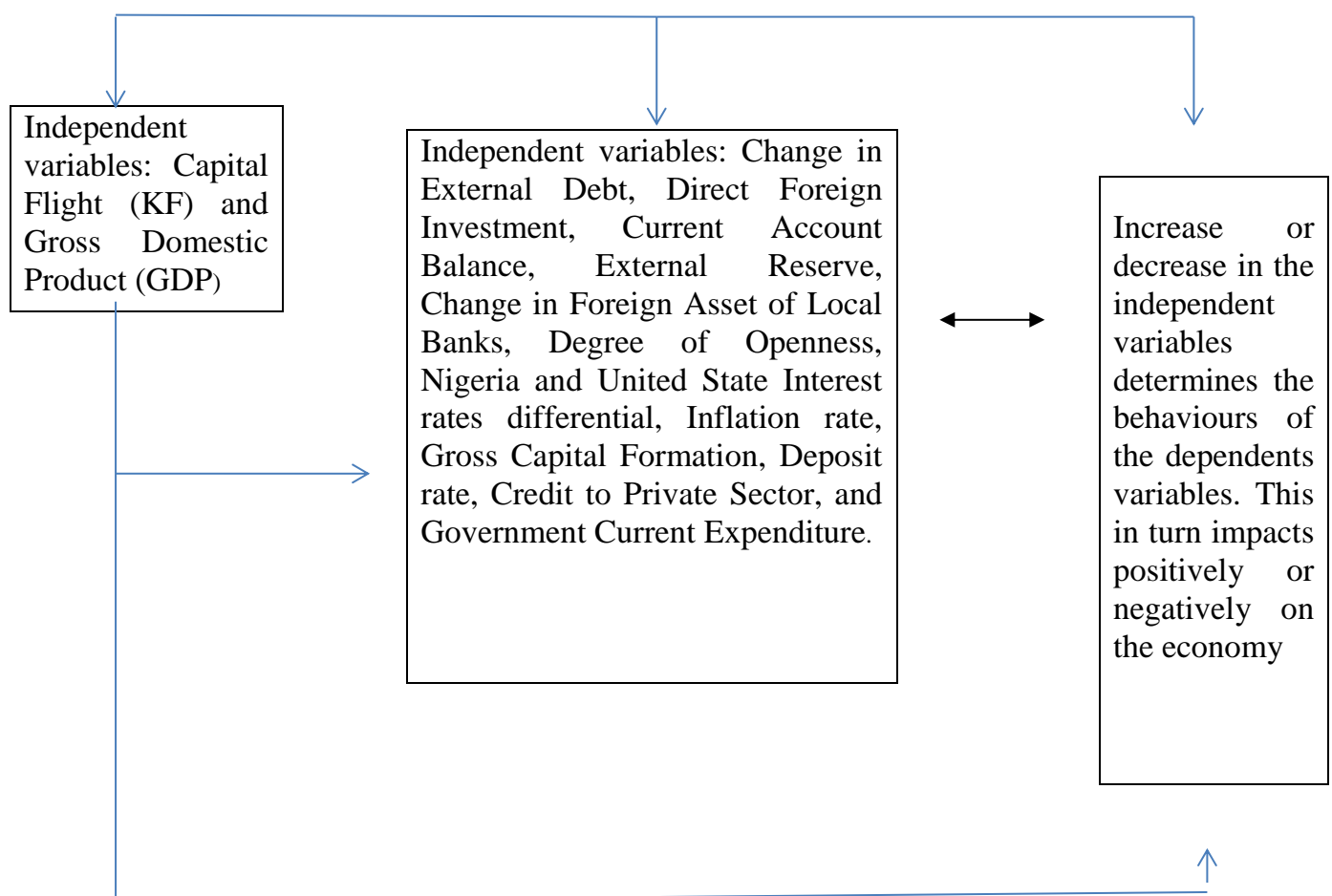
Since the study is quantitative and empirical in nature, it adopts the use of an econometric package called E-View to analyse the short and long run relation between the dependent and independent variables adopted in the study.

3.3 Conceptual Framework

To be able to formulate an effective and reliable conceptual framework for this study, there is need to provide a theoretical basis and link between the dependent and independent variables. From the literature reviewed, the various determinants of capital flight could be grouped into political and economic factors. Although these factors vary from country to country and from region to region, the phenomenon of capital flight is more associated with the developing economies than developed economies, Pastor (1990). To be able to formulate a conceptual framework for the study, the researcher adopts the following variables: Degree of Openness (DOP), Inflation rate (INF), Gross capital formation (GCF), Change in External debt (δ EXDEBT), Deposit rate (DR), Credit to Private sector (PRVCR), United State interest rate differentials (USIRD) and Government consumption expenditure (GOCE) as proxies for capital flight determinants.

Two other models that examine the effect of capital flight on economic growth adopt the Gross Domestic Product (GDP) as the economic growth index while Change in External debt ($\delta EXDEBT$), Direct Foreign Investment (DFI), Current Account Balance (CAB), change in External Reserve (δRES) and Change in Net Foreign Asset of Domestic Financial Institutions ($\delta NEXFAS$). A diagrammatic relationship between the variables and economic growth can be expressed diagrammatically as follows: A diagrammatic illustration of the conceptual framework of the dependents and independent variables is shown below:

Figure 3.1 Conceptual Frameworks for Capital Flight Determinants and Economic Growth.



(Source: Designed for the current study by the author, 2013)

Figure 1 above shows the Interaction between dependents and independent variables and their effect on Economic Growth.

3.4 Theoretical Framework for Model Formulation

To be able to formulate an effective and reliable model for this study, there is need to provide a theoretical basis. From the literature reviewed, the Portfolio-choice theory, Debt Volatility theory and the Corruption theory are relevant in explaining the basis of capital outflow from Nigeria. Although, the various determinants of capital flight have been widely grouped into political and economic factors, these factors vary from country to country and from region to region, the phenomenon of capital flight is more associated with the developing economies than developed economies (Cuddington and Pastor 1990). The review of literature in chapter two revealed that the main determinants of capital flight in Nigeria and in other developing economies include: risk perception/investment climate, fiscal deficits, weak institutions, policies distortions, corruption and money laundering, exchange rate misalignment, financial sector constraints and/or repressions, fiscal deficits and external incentives and disbursement of new loans to LDCs, shortage of foreign exchange and balance of payment crises. (Cuddington, (1987) (Ajayi, (2005); (Ali and Bernard Walters,(2011); (Hermes and Lensiink (2011); Cerra *et al*, (2008); (Frait *et al* (2006, and Rodic (2008).

As observed from various studies in the literature review, capital flight has both short and long run effect on the economic growth of developing economies. Some of these effects are: destabilizing effects on domestic reserve position, reduction in available resource to finance domestic investment, decline in the rate of capital formation, reduction in the countries growth rate, reduction in government ability to tax all the income of its residents, increase in the need to borrow from abroad thereby increasing the foreign debt burden, regressive effects on the distribution of wealth, as well as, diversion of scare resources away from domestic investment and other productive activities (IFC, 1998; Ndikuma, 2000, Lessard and Williamson (1987). Generally, capital flight leads to a net loss in the total resources which are available to an economy for the purpose of investments and growth. Hence, the pace of growth and development in the economy is retarded from what it would have otherwise been. From the above, the main assumptions of the model formulation are discussed in the following section.

3.5 Assumptions of the formulated Models

The following assumptions were made base on the theoretical relationship that exists among the variables in the literature. Hypotheses 1A and 1B were tested in line with the following underlined assumptions and decisions were made.

1. It is assumed that capital flight can be caused by the following variables: Inflation rate, Degree of openness in the economy, Gross capital formation, Change in external debt, Deposit rate, Credit to private sector, United State and Nigeria interest rate differential (USIRD) and Government Current Expenditure (GOCE).

- The researcher contends that when inflation rate is high and real return on domestic investment is low, then capital has the tendency to fly.
- It is expected that if the ratio of the summation of import and export values to the gross Domestic Product is negative or if there are more import than export, capital flight may be induced.
- High stock of Gross capital formation with unfavourable investment climate and high political risk have the tendency to cause capital flight
- It is postulated that an increase in the proportion of change in external debt with high probability of volatility, corruption, money laundering, mis- management and diversion is likely to increase the rate of capital flight.
- This study contends that when the domestic interest rate is high and the cost of investment to the domestic investor is high, the returns on domestic will be reduced. This may prompt domestic investors to move their capital to other economies where they can get higher returns on their investments.
- It is assumed that an increase in the volume of capital availability to the private investors to invest in the domestic economies with unfavourable environment, inadequate infrastructural facilities and high political risk may induce capital flight.

- It is assumed that the difference in the domestic interest rate and that of developed economies like the United State of American in favour of the latter will influence the movement of capital from the domestic to foreign economy.
- An abuse of government current expenditure is expected to fuel capital flight.

(2) This study also assumes that the major capital flight variables that influence economic growth are: (Gross Domestic Product) are Change in external debt, direct foreign investment, Current account balance, Change in external reserve and Change in foreign asset of domestic banking system. Models 2, 5 and 6 were tested in line with the following underlined assumptions.

- It is postulated that an increase in the proportion of change in external debt with effective utilization and adequate management may boost economic growth, whereas ineffective management, high probability of volatility, corruption, money laundering and diversion are likely to have adverse effect on the economic growth.
- The researcher contends that an increase in the level of direct foreign investment with a proportionate good investment climate and political stability may improve the level of economic growth.
- This study contends that a surplus current account balance has the tendency of boosting the economic growth while a deficit current account balance may adversely affect the economy.
- Another underlined assumption of the model in this study is that an increase in the volume or amount of change in external reserve will increase the ability of the country to meet her obligations to the International communities and as such boost the domestic economy. This will invariably lead to improved economy growth.
- The researcher contends that a reduction in the volume or amount of change in external reserve will reduce the ability of the country to meet her obligations to the international communities and as such puts pressure on the domestic economy. This can invariably lead to capital flight to other economies with stable economic enviromen

- Finally, it is assumed in this study that the amount of change in the asset of domestic bank kept in another country will affect the economic growth of the domestic economy. Moderate increase in foreign asset of domestic bank in another economy will make available adequate capital for domestic economy, as well as, yield returns from foreign investment, this will boost economic growth. On the other hand, too much investment in foreign asset may deprive the domestic economy from the needed capital to boost economic growth.

3.6 Models Specification

Sequel to the above, the following models are adopted for the purpose of this study. Two models with each consisting of two equations were formulated to test the determinants and effects of capital flight on the Nigerian economy between 1970 and 2011 while four other models with each consisting of two equations each were formulated to test the determinants and effects of capital flight on the Nigerian economy in the Pre and Post SAP era. The two equations under each model (A and B) represent the World Bank and Erbe (1985) approach and the Morgan Trust (1986) approach of the residual method respectively. In model 1, Capital Flight (KF) is the dependent variable while Gross Domestic Product is the dependent variable in model 2. In the same vain, Capital Flight (KF) is the dependent variable in model 3 and 4 while the Gross Domestic Product is the dependent variable in model 5 and 6. Major macro economic variables such as the degree of openness (DOP), inflation rate (INF), gross capital formation (GCF), change in external debt ($\delta EXDEBT$), change in external reserve (δRES), deposit rate (DR), credit to private sector (PRIVCR) and foreign asset of domestic banking system ($\delta NEXTAS$) stand for the independent variables in models 1, 3, and 5 while change in External Debt ($\delta EXDEBT$), Direct Foreign Investment (DFI), Current Account Balance (CAB), change in External reserve (δRES) and change foreign asset of domestic banking system ($\delta NEXTAS$) are the independent variables in models 2, 4 and 6. Given the above models, the stated hypotheses in chapter one was tested under the residual model of capital flight estimates. Hypotheses 1, 3 and 4 will be tested under model 1, 3 and 4 while hypothesis 2 was tested under model 2, 5 and 6.

Recall from equations 2.2 and 2.3 where the original residual approach was stated in World Bank and Erbe (1985) and Morgan Guaranty Trust (1986) as:

$$KF(WB) = \delta EXDEBT + G + F - N.$$

$$KF(MORG) = \delta EXDEBT + G + F - N - I.$$

Where:

KF (WB) = Capital Flight measured by the World Bank approach,

$\delta EXDEBT$ = Changes in External Debt.

G = Foreign Direct Investment

F = Current Account Balance

N = Change in Reserve

I = Increase in Foreign Assets of the Domestic Banking System

The above residual approach expressed in World Bank and Erbe (1985) and Morgan Guaranty Trust (1986) was adopted for capital flight estimation

Model 1

This model examines the determinants of capital flight in Nigeria between 1970 and 2011. The Model consists of two equations representing the two components of the residual approach for estimating capital flight.

The first equation evaluates the determinants of capital flight in Nigeria between 1970 and 2011 using the World Bank and Erbe (1985) method of capital flight estimates of the residual approach while the second equation evaluates the determinants of capital flight in Nigeria between 1970 and 2011 using the Morgan trust (1986) approach of the residual approach. The two equations are specified as:

$$KFW = f(DOP, INF, GCF, \delta EXDEBT, DR, PRIVCR, USIRD, GOCE, \mu) \dots\dots\dots(3.1)$$

$$KFM = (DOP, INF, GCF, \delta EXDEBT, DR, PRIVCR, GOCE, \delta NEXTAS, \mu) \text{-----} (3.2)$$

Where:

KFW = World Bank and Erbe (1985) capital flight estimate

MKF = Morgan trust (1986) capital flight estimate

DOP	=	Degree of openness
INF	=	Inflation rate
GCF	=	Gross Capital Formation
$\delta EXDEBT$	=	Change in External Debt
$\delta NEXTAS$	=	Increase In Foreign Asset Of Domestic Banking System
DR	=	Deposit rate
PRIVCR	=	Credit to private sector
USIRD	=	USA and Nigeria interest rate differential
GOCE	=	Government Current Expenditure
μ	=	Stochastic error term
F	=	Functional relationship between the dependent Variable (KF) and the independent variables.

The two equations are denoted as equation equation 3.1 and 3.2 respectively. Equation 3.1 explains the World Bank and Erbe (1985) method of capital flight estimates while equation 3.2 explains the Morgan trust (1986) method of calculating capital flight and both determinants of capital flight in Nigeria between 1970 and 2011.

The World Bank and Morgan Trust approaches are stated explicitly as below:

(a) The Morgan Trust estimate is stated explicitly below:

$$KFW = \theta_0 + \theta_1 DOP + \theta_2 INF + \theta_3 GCF + \theta_4 \delta EXDEBT + \theta_5 DR + \theta_6 PRIVCR + \theta_7 USIRD + \theta_8 GOCE + \mu \dots\dots\dots(3.3)$$

Where θ_0 = intercept of the equation

By log-linearising the model, it becomes

$$LogKFW = \theta_0 + \theta_1 LogDOP + \theta_2 LogINF + \theta_3 LogGCF + \theta_4 Log\delta EXDEBT + \theta_5 LogDR + \theta_6 LogPRIVCR + \theta_7 LogUSIRD + \theta_8 LogGOCE + \mu \dots\dots\dots(3.4)$$

Where: Where: Log = Natural Logarithm

$\theta_1, \theta_2, \theta_3, \dots, \theta_8$ = Coefficients of Estimates

μ = Error term

(b) The Morgan Trust estimate is stated explicitly below:

$$KFM = \lambda_0 + \lambda_1 DOP + \lambda_2 INF + \lambda_3 GCF + \lambda_4 \delta EXDEBT + \lambda_5 DR + \lambda_6 PRIVCR + \lambda_7 USIRD + \lambda_8 GOCE + \mu \dots \dots \dots (3.5)$$

Where;

KFM = Morgan Trust (1986) estimate of capital flight.

Where λ_0 = intercept of the equation

By log-linearising the model, it becomes

$$\begin{aligned} \log KFM = & \lambda_0 + \lambda_1 \log DOP + \lambda_2 \log INF + \lambda_3 \log GCF + \lambda_4 \log \delta EXDEBT + \lambda_5 \log DR \\ & + \lambda_6 \log PRIVCR + \lambda_7 \log USIRD + \lambda_8 \log GOCE + \mu \dots \dots \dots (3.6) \end{aligned}$$

λ_0 is the intercept and $\lambda_1, \lambda_2, \lambda_3, \dots, \lambda_8$ = Coefficient of Estimates and other variables as defined in equation 3.1 and 3.2

Model 2

This model examines the impact of capital flight on economic growth in Nigheria between 1970 and 2011. It consists of two equations representing the two components of the residual approach for estimating capital flight namely the World Bank and Erbe (1985) approach and the Morgan trust (1986). The two equations are specified as:

a. World Bank and Erbe (1985) capital flight estimate

$$GDP = f(\delta EXDEBT, DFI, CAB, \delta RES, \mu) \dots \dots \dots (3.7)$$

Where

GDP	-	Gross domestic product (at current market price)
DFI	-	Direct foreign investment
CAB	-	Current accout Balance
δRES	-	Change in External Reserve

μ - Stochastic error term

F- Functional relationship between the dependent Variable (GDP) and independent variable.

Stating the Model explicitly :

$$GDP = \alpha_0 + \alpha_1 \delta EXDEBT + \alpha_2 DFI + \alpha_3 CAB + \alpha_4 \delta RES + \mu \dots\dots\dots(3.8)$$

Where α_0 is the intercept and $\alpha_1 \dots \alpha_4$ = intercept of the equation in the model and other variables are as defined in equation 3.7

By log-linearising the model, it becomes

$$\begin{aligned} \text{LogGDP} = & \alpha_0 + \alpha_1 \text{Log} \delta EXDEBT + \alpha_2 \text{LogDFI} + \alpha_3 \text{LogCAB} \\ & + \alpha_4 \text{Log} \delta RES + \mu \dots\dots\dots(3.9) \end{aligned}$$

b. Morgan trust (1986) capital flight estimate

$$GDP = f(\delta EXDEBT, DFI, CAB, \delta RES, NEXTAS, \mu) \dots\dots\dots(3.10)$$

Where:

$\delta NEXTAS$ = Change in foreign asset of domestic banking system, other variables remained as defined in equation 3.7

Stating the model explicitly:

$$GDP = \beta_0 + \beta_1 \delta EXDEBT + \beta_2 DFI + \beta_3 CAB + \beta_4 \delta RES + \dots\dots\dots(3.11)$$

Where:

β_0 = Intercept of the equation

By log-linearising the model, it becomes

$$\begin{aligned} \text{Log GDP} = & \beta_0 + \beta_1 \text{Log} \delta EXDEBT + \beta_2 \text{LogDFI} + \beta_3 \text{LogCAB} + \beta_4 \text{Log} \delta RES + \beta_5 \text{Log} \delta NEXTAS + \mu \\ & \dots\dots\dots (3.12) \end{aligned}$$

Where: $\beta_1, \beta_2, \beta_3, \dots, \beta_5$ = Coefficients of Estimates.

Model 3

This model examines the determinants of capital flight in Nigeria between 1970 and 1986 which marks the Pre-SAP era. It also consists of two equations representing the two components of the residual approach for

estimating capital flight namely the World Bank and Erbe (1985) approach and the Morgan trust (1986).

The two equations are specified as:

$$KFW_{PRESAP} = f(DOP, INF, GCF, \delta EXDEBT, DR, PRIVCR, GOCE, \mu) \dots \dots \dots (3.13)$$

$$KFM_{PRESAP} = f(DOP, INF, GCF, \delta EXDEBT, DR, PRIVCR, GOCE, \delta NEXTAX, \mu) \dots \dots \dots (3.14)$$

Where:

KFW_{PRESAP} = World Bank and Erbe (1985) capital flight estimate in the Pre SAP era

KFM_{PRESAP} = Morgan trust (1986) capital flight estimate in the Pre SAP era

Other variables are as defined in equation 3.1 and 3.2

Equation 3.13 and 3.14 can explicitly be stated as:

a. World Bank and Erbe (1985) capital flight estimate

$$KFW_{PRESAP} = \alpha_0 + \alpha_1 DOP + \alpha_2 INF + \alpha_3 GCF + \alpha_4 \delta EXDEBT + \alpha_5 DR + \alpha_6 PRIVCR + \alpha_7 USIRD + \alpha_8 GOCE + \mu \dots \dots \dots (3.15)$$

Where α_0 = intercept of the equation $\alpha_1, \alpha_2, \alpha_3, \dots, \alpha_8$ = Coefficients of Estimates

μ = Error term.

By log-linearising the model, it becomes

$$\text{Log} KFW_{PRESAP} = \alpha_0 + \alpha_1 \text{Log} DOP + \alpha_2 \text{Log} INF + \alpha_3 \text{Log} GCF + \alpha_4 \text{Log} \delta EXDEBT + \alpha_5 \text{Log} DR + \alpha_6 \text{Log} PRIVCR + \alpha_7 \text{Log} USIRD + \alpha_8 \text{Log} GOCE + \mu \dots \dots \dots (3.16)$$

Where: Log = Natural Logarithm and other variables as defined in equation 3.15

(b) The Morgan Trust estimate is stated explicitly below:

$$KFM_{PRESAP} = \varepsilon_0 + \varepsilon_1 DOP + \varepsilon_2 INF + \varepsilon_3 GCF + \varepsilon_4 \delta EXDEBT + \varepsilon_5 DR + \varepsilon_6 PRIVCR + \varepsilon_7 USIRD + \varepsilon_8 GOCE + \mu \dots \dots \dots (3.17)$$

Where ε_0 = intercept of the equation $\varepsilon_1, \varepsilon_2, \varepsilon_3, \dots, \varepsilon_8$ = Coefficients of Estimates

μ = Error term.

By log-linearising the model, we have:

$$\begin{aligned} \text{LogKFM}_{\text{PRESAP}} = & \varepsilon_0 + \varepsilon_1 \text{LogDOP} + \varepsilon_2 \text{LogINF} + \varepsilon_3 \text{LogGCF} + \varepsilon_4 \text{Log}\delta\text{EXDEBT} + \varepsilon_5 \text{LogDR} + \varepsilon_6 \text{LogPRIVCR} \\ & + \varepsilon_7 \text{LogUSIRD} + \varepsilon_8 \text{LogGOCE} + \mu \dots \dots \dots (3.18) \end{aligned}$$

Where: Log = Natural Logarithm and other variables as defined in equation 3.15

Model 4

The model examines the determinants of capital flight in Nigeria between 1987 and 2011; this period marks the Post-SAP era. The model consists of two equations representing the two components of the residual approach for estimating capital flight namely the World Bank and Erbe (1985) approach and the Morgan trust (1986). The two equations are specified as:

$$KFW_{\text{POSTSAP}} = f(\text{DOP}, \text{INF}, \text{GCF}, \delta\text{EXDEBT}, \text{DR}, \text{PRIVCR}, \text{GOCE}, \mu) \dots \dots \dots (3.19)$$

$$KFM_{\text{POSTSAP}} = f(\text{DOP}, \text{INF}, \text{GCF}, \delta\text{EXDEBT}, \text{DR}, \text{PRIVCR}, \text{GOCE}, \delta\text{NEXTAX}, \mu) \dots \dots \dots (3.20)$$

Where:

KFW_{POSTSAP} = World Bank and Erbe (1985) capital flight estimate in the POST-SAP era

KFM_{POSTSAP} = Morgan trust (1986) capital flight estimate in the POST- SAP era

Other variables are as defined in equation 3.15 and 3.16.

Equation 3.19 and 3.20 can be further expressed as:

(a). World Bank and Erbe (1985) capital flight estimate

$$\begin{aligned} KFW_{\text{POSTSAP}} = & \beta_0 + \beta_1 \text{DOP} + \beta_2 \text{INF} + \beta_3 \text{GCF} + \beta_4 \delta\text{EXDEBT} + \beta_5 \text{DR} \\ & + \beta_6 \text{PRIVCR} + \beta_7 \text{USIRD} + \beta_8 \text{GOCE} + \mu \dots \dots \dots (3.21) \end{aligned}$$

Where β_0 = intercept of the equation $\beta_0, \beta_1, \beta_2, \beta_3, \dots, \beta_8$ = Coefficients of Estimates

μ = Error term.

By log-linearising the model, it becomes

$$\begin{aligned} \text{LogKFW}_{\text{PRESAP}} = & \beta_0 + \beta_1 \text{LogDOP} + \beta_2 \text{LogINF} + \beta_3 \text{LogGCF} + \beta_4 \text{Log}\delta\text{EXDEBT} + \beta_5 \text{LogDR} \\ & + \beta_6 \text{LogPRIVCR} + \beta_7 \text{LogUSIRD} + \beta_8 \text{LogGOCE} + \mu \dots \dots \dots (3.22) \end{aligned}$$

Where: Log = Natural Logarithm and other variables as defined in equation 3.19

(b) The Morgan Trust estimate is stated explicitly below:

$$KFM_{POSTSAP} = d_0 + d_1DOP + d_2INF + d_3GCF + d_4\delta EXDEBT + d_5DR + d_6PRIVCR + d_7USIRD + d_8GOCE + \mu \dots \dots \dots (3.23)$$

Where d_0 = intercept of the equation $d_1, d_2, d_3, \dots, d_8$ = Coefficient of Estimates
 μ = Error term.

By log-linearising the model, we have:

$$\text{Log}KFM_{PRESAP} = d_0 + d_1\text{Log}DOP + d_2\text{Log}INF + d_3\text{Log}GCF + d_4\text{Log}\delta EXDEBT + d_5\text{Log}DR + d_6\text{Log}PRIVCR + d_7\text{Log}USIRD + d_8\text{Log}GOCE + \mu \dots \dots \dots (3.24)$$

Where: Log = Natural Logarithm and other variables as defined in equation 3.19

Model 5

This model examines the effect of capital flight on the Nigeria economic growth in the Pre-SAP era (1970-1986). It is made up of two equations which represent the two components of the residual approach for estimating capital flight (World Bank and Erbe (1985) and Morgan trust (1986)). The two equations are specified as:

a. World Bank and Erbe (1985) capital flight estimate

$$GDP_{PRESAP} = f(\delta EXDEBT, DFI, CAB, \delta RES, \mu) \dots \dots \dots (3.25)$$

Where:

GDP_{PRESAP} -- Gross domestic product (at current market price) before SAP, other variables are as defined in equation 3.11

Stating the Model explicitly :

$$GDP_{PRESAP} = \phi_0 + \phi_1\delta EXDEBT + \phi_2 DFI + \phi_3 CAB + \phi_4 \delta RES + \mu \dots \dots \dots (3.26)$$

Where ϕ_0 = Intercept and ϕ_1, \dots, ϕ_4 are the coefficients of the estimates in the model and other variables are as defined in equation 3.7

By log-linearising equation 3.30 becomes:

$$\text{Log}GDP_{PRESAP} = \phi_0 + \phi_1\text{Log}\delta EXDEBT + \phi_2\text{Log}DFI + \phi_3\text{Log}CAB + \phi_4\text{Log}\delta RES + \mu \dots \dots \dots (3.27)$$

For Morgan trust (1986) capital flight estimate we have:

$$GDP_{PRESAP} = f(\delta EXDEBT, DFI, CAB, dRES, \delta NEXTAS, \mu) \dots \dots \dots (3.28)$$

Where:

$\delta NEXTAS$ = Change in foreign asset of domestic banking system, other variables remained as defined in equation 3.7

Stating the model explicitly, we have:

$$GDP_{PRESAP} = Q_0 + Q_1 \delta EXDEBT + Q_2 DFI + Q_3 CAB + Q_4 \delta RES + Q_5 \delta NEXTAS + \dots \dots \dots (3.29)$$

Where: Q_0 , is the intercept of the equation in the model

$Q_1 \dots Q_5$ are the coefficients of the estimates.

$\delta NEXTAS$ = Change in foreign asset of domestic banking system, other variable remained as defined in equation 3.7

By log-linearising equation 3.29, we have:

$$\begin{aligned} \text{Log} GDP_{PRESAP} = & Q_0 + Q_1 \text{Log} \delta EXDEBT + Q_2 \text{Log} DFI + Q_3 \text{Log} CAB + Q_4 \text{Log} \delta RES + Q_5 \text{Log} \delta NEXTAS + \\ & \mu \dots \dots \dots (3.30) \end{aligned}$$

Where: Log = Natural Logarithm and other variables as defined in equation 3.17

$\delta NEXTAS$ = Change in foreign asset of domestic banking system, other variable remained as defined in equation 3.7

Model 6

This last model examines the effect of capital flight on the Nigeria economic growth in the Pos-SAP era (1987-2011). It is made up of two equations which represent the two components of the residual approach for estimating capital flight (World Bank and Erbe (1985) and Morgan trust (1986)). The two equations are specified as:

a. World Bank and Erbe (1985) capital flight estimate

$$GDP_{POSTSAP} = f(\delta EXDEBT, DFI, CAB, \delta RES, \mu) \dots \dots \dots (3.31)$$

Where:

$GDP_{POSTSAP}$ -- Gross domestic product (at current market price) after SAP, other variables are as defined in equation 3.7

Stating the Model explicitly :

$$GDP_{POSTSAP} = \chi_0 + \chi_1 \delta EXDEBT + \chi_2 DFI + \chi_3 CAB + \chi_4 \delta RES + \mu \dots \dots \dots (3.32)$$

Where χ_0 , is the intercept of the equation while χ_1 ---- χ_4 are the coefficients of estimates in the model and other variables are as defined in equation 3.7

By log-linearising equation 3.36 becomes:

$$\text{Log} GDP_{POSTSAP} = \chi_0 + \chi_1 \text{Log} \delta EXDEBT + \chi_2 \text{Log} DFI + \chi_3 \text{Log} CAB + \chi_4 \text{Log} \delta RES + \mu \dots \dots \dots (3.33)$$

For Morgan trust (1986) capital flight estimate we have:

$$GDP_{POSTSAP} = f(\delta EXDEBT, DFI, CAB, \delta RES, \delta NEXTAS, \mu) \dots \dots \dots (3.34)$$

Where:

$GDP_{POSTSAP}$ -- Gross domestic product (at current market price) after SAP

$\delta NEXTAS$ = Change in foreign asset of domestic banking system, other variables remained as defined in equation 3.7

Stating the model explicitly, we have:

$$GDP_{POSTSAP} = p_0 + p_1 \delta EXDEBT + p_2 DFI + p_3 CAB + p_4 \delta RES + p_5 \delta NEXTAS + \mu \dots \dots \dots (3.35)$$

Where: p_0 is the intercept, p_1 ---- p_5 are the coefficients of estimates in the equation ,

$\delta NEXTAS$ = Change in foreign asset of domestic banking system, other variable remained as defined in equation 3.7

By log-linearising, equation 3.35 becomes:

$$\text{Log} GDP_{POSTSAP} = p_0 + p_1 \text{Log} \delta EXDEBT + p_2 \text{Log} DFI + p_3 \text{Log} CAB + p_4 \text{Log} \delta RES + p_5 \text{Log} \delta NEXTAS + \mu \dots \dots \dots (3.36)$$

Where: Log = Natural Logarithm and other variables as defined in equation 3.7

3.7 *A Priori* Expectations

Based on theoretical assumptions of model formulated, the following relationships are expected between the variables in the following models:

Models 1, 3 and 4

1. Model 1. The determinants of capital flight in Nigeria between 1970 and 2011

2. Model 3. The determinants of capital flight in Nigeria in Pre- SAP era (1970 -1986).

3. Model 4. The determinants of capital flight in Nigeria in the Post-SAP era (1987 – 2011).

a. It is expected that a positive relationship exists between capital flight (KF) and the degree of openness (DOP). That is, $\delta KF / \delta DOP > 0$

b. it is expected that a positive relationship should exist between capital flight (KF) and inflation rate (INF). That is $\delta KF / \delta INF > 0$

c. it is expected that a negative relationship should exist between capital flight (KF) and Gross domestic formation (GCF) That is, $\delta KF / \delta GCF < 0$

d. it is expected that an increase in change external debt ($\delta EXDEBT$) should reduce the rate capital flight (KF) . That is, $\delta KF / \delta EXDEBT < 0$

e. it is also expected that an increase in domestic deposit rate (DR) should reduce KF. That is, $\delta KF / \delta DR < 0$

f. it is also expected that an increase in private sector credit (PRIVCR) should reduce capital flight (KF). That is, $\delta KF / \delta PRIVCR < 0$

g. it is expected that a higher cost of funds in domestic economy will encourage the movement of capital abroad. That is, $\delta KF / \delta USIRD > 0$

h. A change in government expenditure is expected to have either a negative impact on the level of capital flight (KF) depending on appropriate or inappropriate use. KF. That is, $KF / GOCE > \text{or} < 0$

Models 2, 5 and 6

1. Model 2. The effect of capital flight on the Nigerian Economic Growth between 1970 and 2011.

2. Model 5. The effect of capital flight on the Nigerian Economic Growth in the Pre-SAP era (1970 – 1986).

3. Model 6 The effect of capital flight on the Nigerian Economic Growth in the Post-SAP era (1987-2011).

It is expected that a positive relationship should exist between change in Gross Domestic Product (δGDP) and Direct foreign investment (DFI). That is, $\delta GDP/\delta DFI > 0$

i. It is also expected that a positive relationship should exist between Gross Domestic Product (GDP) and Current account balance (CAB). That is, $\delta GDP/\delta CAB > 0$

j. A positive or negative relationship is also expected between Gross Domestic Product and Foreign exchange reserve (RES) That is, $\delta GDP/\delta RES > 0$

k. It is expected that a positive or negative relationship should exist between between Gross Domestic Product (GDP) change in foreign asset of domestic banking system($\delta NEXTAS$) That is, $\delta GDP/\delta NEXTAS > 0$. From the above, > 0 signifies a positive relationship, implying that an increase in the explanatory variable will result into an increase in the explained variable while < 0 signifies a negative relationship among the variables, implying that an increase in the explanatory variable will result into reduction in the explained variable.

Models 1, 3 and 4 (on determinant of capital flight in Nigeria) were evaluated separately while model 2, 5 and 6 (on the effect of capital flight in Nigeria) were also evaluated separately. Thus, the link among models 1, 3, 4 and models 2, 5 and 6 were not examined in this study

3.8 Nature and Sources of Data

For the purpose of this study, time series data were used. These data were secondary, mainly the Central Bank of Nigeria (CBN), Federal Office of Statistics (FOS), World Bank Statistical Information, World Debt Tables, IMF International Financial Statistics and the United State Federal Reserve.

3.9 Description of Variables

Below are short descriptions of the various variables adopted as proxies in this study:

1. **Gross Domestic Product (GDP):** This is the money value of goods and services produced in an economy during a period of time irrespective of the nationality of the people who produced the goods and services. GDP at current market prices as used in this study equals GDP at current basic prices plus

indirect taxes net of subsidies. This is GDP value at the market prices which purchasers pay for the good and services they acquire or use. The GDP is generally taken as a measure of economic growth since it measures the total value created in an economy in a given period.

2. Change in External Debt ($\delta EXDEBT$): This is debt that is owed by a country to other nations. External loans become inevitable for government when economy faces financial crisis. Change in external debt is difference between the current and previous value or variation in the value of debt that is owed to other nations or external organisations.

3. Direct Foreign Investment (DFI): This involves investment made to acquire a lasting management interest, usually at least 10% of voting stocks, in an enterprise operating in a country other than that of the investor. It also involves investment in real asset, where real assets consist of physical items, such as factors, land, capital goods, infrastructure and inventories operating in another country. Multinational corporations are the chief source of direct foreign investment.

4. Current Account Balance (CAB): The current account balance on the BOP is divided into two major sectors; visible and invisible. The visible account consists of goods account (Export and Imports) which are tangible physical commodities. Exports are credit entries as non-residents acquiring goods have to pay the exporting country. Imports are 'debit' entries as the importers have to use up his stock of foreign currencies to pay for the imported goods. The invisible section includes the value of export and import such as transport, freight, travels, insurance and other business services which are recorded 'free-on-board' (F.O.B) to show the actual costs of the goods without insurance and freight.

5. Change In External Reserve (δRES): These are funds or natural resources (raw materials) of a country set aside for emergencies or other future needs in another country.

6. Degree Of Openness (DOP): This measures the rate at which an economy is open to foreign trade. It is the ratio of the summation of export and import values to GDP.

7. Inflation Rate (INF): Inflation is the persistent increase in prices of goods and services. This is a control variable that is used to measure the cause of capital flight in Nigeria. It is an economic situation whereby money chases fewer goods.

8. **Deposit Rate (DR):** Deposit may be in form of cash, cheque or valuables. Deposit rate refers to the minimum rates that can be paid on savings and time deposits at commercial banks, mutual savings banks, loan association and credit unions.
9. **Credit To Private Sector (PRIVCR):** These are funds given by government to the organized private sector through the commercial banks or any other financial institution saddled with the responsibility of intermediating between the surplus and the deficit units in Nigeria economy.
10. **Increase In Foreign Asset Of Domestic Banking System (δ NEXTAS):** These are assets of domestic banks in another country, this is in form of investments of a bank in another country other than its own country. This investment can be in real assets or financial securities abroad. This variable measures the modification of World Bank (1985) and Erbe (1985) by Morgan (1986).
11. **Capital Flight (KF):** The term capital flight as used in this study connotes illegal movement of capital or funds from one country to another usually from developing countries to developed countries. This connotation implies that there may be “normal” or “legal” and “abnormal” or “illegal” flows. This variable as used in the study is the estimate according to World Bank (1985) and Erbe (1985).
12. **Gross Capital Formation (Gross Domestic Investment):** This is the total change in the value of fixed assets plus change in stocks.
13. **United State of America Interest Rate Differential (USIRD):** This is the difference between the interest rate of home economy (Nigeria) and that of U.S.A. The United State of American Dollar is chosen because it is one of the most acceptable high currencies. It is expected that interest rate differential will encourage movement of capital from one economy to another.
14. **Government Current Expenditure (GOCE):** Government current expenditure is an outflow of financial resources from government to other sectors of the economy. Particularly, it involves payment for transaction within one year; a larger proportion of national budget in Nigeria is into current and recurrent expenditure. A judicious use of current expenditure will promote societal welfare while a diversion by political office holders through capital flight could spell doom for the country.

3.10 Estimation Technique

In the study, two (2) analytical techniques are adopted in testing for both short and long run equilibrium relationships among the specified variables in the model. The technique adopted in testing for the short-run linear relationship is the Ordinary Least Square technique of Regression analysis. This involves the use of the student T-distribution test and F-test in testing for the significance of the parameters and the model. The co-integration analysis and the Error correction mechanism (ECM) techniques were used for estimation of the long-run equilibrium relationships among the specified variables in the models. The co-integrating analytical technique is used to analyse the formulated models in this study. This involves the use of unit root test, co-integration test and error correction model. As stated earlier, the test of hypothesis for each parameter is conducted using the standard error test. The Johansen co-integration test is employed in testing for co-integration among the variables while Augmented Dickey Fuller test (ADF) unit root tests is used for determining the stationarity of the variables series. Therefore, the short and long-run relationships are compared in making necessary conclusions and recommendations.

3.10.1 Co-Integration Analysis

The concept of co-integration relates to the existence of a long-run equilibrium relationship to which an economic system converges overtime and equilibrium relationship among the set of non-stationary variables influencing it, and this implies that their stochastic trends must be linked. It is necessary to assess whether the series in a time series data are stationary or not. The reason is that regression of a non-stationary series on another non-stationary series may lead to what is known as spurious regression. Thus, implicit in the co-integration theory is that, there exists a linear combination of these non-stationary variables that is stationary. If two series are non-stationary but their linear combination is, the two series are said to be co-integrated series. To be co-integrated means that the variables- series move together in the long run at same rate (Davidson and Mackinnon, 1993). In this study, we test for the stationarity of the variables through the Augmented Dickey Fuller (ADF) unit root test.

3.10.2 Unit Root Test

This is the first step in co-integration analysis and it is the standard approach to investigate the stationarity of a time series. This test is relevant because statistical test of the parameter resulting from spurious regression, sequel to regression of a non-stationary series on another non-stationary series may be biased and inconsistent (Engle and Granger, 1987). The Augmented Dickey-Fuller (ADF) unit root equation is specified below:

ADF Equation:

$$\delta y_t = \beta_1 \delta y_{t-1} + \beta_2 \delta y_{t-2} + \beta_3 \delta y_{t-3} + \beta_4 \delta y_{t-4} + \beta_5 \delta y_{t-5} + \beta_6 \delta y_{t-6} + \dots + \beta_n \delta y_{t-n} + \epsilon_t \dots \dots \dots (3.37)$$

where δy_t is dependent variable in model 1A, 1B, 2A and 2B $\beta_1 \delta y_{t-1}, \beta_2 \delta y_{t-2}, \beta_3 \delta y_{t-3}, \beta_4 \delta y_{t-4}, \beta_5 \delta y_{t-5}, \beta_6 \delta y_{t-6}, \beta_n \delta y_{t-n}$ is assumed to represent the independent variables in Model 1,2, 3, 4, 5, and 6 \sum_t is the white noise residual.

3.10.3 Co-Integration Test and Error Correction Mechanism

Having established stationarity of the variables, I proceeded to investigate whether or not there is such a relationship labeled “co-integration among the variables. This is sequel to the fact that, although economic variables may not be stationary individually, a mechanism could still exist that prevents some of the variables from diverging significantly from one another. The number of co-integration equation which is known as “co-integration rank” can be decided through the Johansen tests. The hypothesis of the (H_0) is that there is no-cointegrating vector or there is one co-integration vector. This implies that the variables in the model have no equilibrium condition that keeps them in proportion to one another in the long run. To this hypothesis, compare the likelihood ratio in each of the row of the upper table of the output of the Johansen co-integration test to their corresponding critical values. If the likelihood ratio is greater than the critical value, then reject the null hypothesis and accept the alternative hypothesis of the existence of co-integration and vice-versa. The issues of error correction model (ECM) series arises when the various statistical tests performed supports the existence of co-integrating relationship between the dependent variable and any (or a combination) of its explanatory variables. The first error correction model (ECM1) known as the “over

parameterized” ECM involves lagging of variable in the regression equation Gujarati (2005). The lead and the lag variables can be expressed as:

i.e $D(A,2)D(A(-1),2)D(B,2)D(B(-1),2)D(C,2)D(-1),2).....D(N,2)D(-1),2) D(ECM(-1))$

Where D means change, A.....N, means number of variables, -1 means lag period, 2 means lead period and (ECM (-1) value denotes the rate of adjustment from short to long run equilibrium.

However, “parsimonious” error correction model (ECM) is simply to introduce dynamism into the model. The selection of this final vector error correction model (ECM) should be based on economic as well as statistic criteria of evaluation put differently, only the variables that are statistically significant are reported in ECM2.

Specifying the models in a general ECM (Error Correction Mechanism)

MODEL IA (World Bank and Erbe Approach)

$$\delta \log (KFW) = \theta_0 + \delta \log (DOP)_{t-1} + \delta \log (INF)_{t-1} + \delta \log (GCF)_{t-1} + \delta \log (EXDEBT)_{t-1} + \delta \log (DR)_{t-1} + \delta \log (PRIVCR)_{t-1} + \delta \log (USIRD)_{t-1} + \delta \log (GOCE)_{t-1} + \sum_t \delta \log (GOCE)_{t-1} + \sum_t (3.38)$$

Where:

t-1 = Meaning they were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL IB (Morgan Trust (1986) Approach)

$$\delta \log \delta (KFM) = \lambda_0 + \delta \log \delta (DOP)_{t-1} + \delta \log \delta (INF)_{t-1} + \delta \log \delta (GCF)_{t-1} + \delta \log \delta (EXDEBT)_{t-1} + \delta \log \delta (DR)_{t-1} + \delta \log \delta (PRIVCR)_{t-1} + \delta \log \delta (USIRD)_{t-1} + \delta \log \delta (GOCE)_{t-1} (3.39)$$

Where:

t-1 = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 2A (World Bank and Erbe Approach)

$$\delta \log(GDP) = \alpha_0 + \delta \log(EXDEBT)_{t-1} + \delta \log(DFI)_{t-1} + \delta \log(CAB)_{t-1} + \delta \log(RES)_{t-1} + \sum_t \dots (3.40)$$

Where:

$t-1$ = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 2B (Morgan Trust (1986) Approach)

$$\delta \log(GDP) = \beta_0 + \delta \log(EXDEBT)_{t-1} + \delta \log(DFI)_{t-1} + \delta \log(CAB)_{t-1} + \delta \log(RES)_{t-1} + \delta \log(NEXTAS)_{t-1} + \sum_t \dots (3.41)$$

Where:

$t-1$ = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 3A (World Bank and Erbe Approach)

$$\delta \log(KFW_{PRESAP}) = \alpha_0 + \delta \log(DOP)_{t-1} + \delta \log(INF)_{t-1} + \delta \log(GCF)_{t-1} + \delta \log(EXDEBT)_{t-1} + \delta \log(DR)_{t-1} + \delta \log(PRIVCR)_{t-1} + \delta \log(USIRD)_{t-1} + \delta \log(GOCE)_{t-1} + \sum_t \delta \log(GOCE)_{t-1} + \sum_t \dots (3.42)$$

Where:

$t-1$ = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 3B (Morgan Trust (1986) Approach)

$$\delta \log(KFM_{PRESAP}) = \epsilon_0 + \delta \log(DOP)_{t-1} + \delta \log(INF)_{t-1} + \delta \log(GCF)_{t-1} + \delta \log(EXDEBT)_{t-1} + \delta \log(DR)_{t-1} + \delta \log(PRIVCR)_{t-1} + \delta \log(USIRD)_{t-1} + \delta \log(GOCE)_{t-1} + \dots (3.43)$$

Where:

t-1 = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 4A (World Bank and Erbe Approach)

$$\delta \log (KFW_{POSTSAP}) = \phi_0 + \delta \log (DOP)_{t-1} + \delta \log (INF)_{t-1} + \delta \log (GCF)_{t-1} + \delta \log (EXDEBT)_{t-1} + \delta \log (DR)_{t-1} + \delta \log (PRIVCR)_{t-1} + \delta \log (USIRD)_{t-1} + \delta \log (GOCE)_{t-1} + \sum_t \delta \log (GOCE)_{t-1} + \dots (3.44)$$

Where:

t-1 = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 4B (Morgan Trust (1986) Approach)

$$\delta \log (KFM_{POSTSAP}) = \phi_0 + \delta \log (DOP)_{t-1} + \delta \log (INF)_{t-1} + \delta \log (GCF)_{t-1} + \delta \log (EXDEBT)_{t-1} + \delta \log (DR)_{t-1} + \delta \log (PRIVCR)_{t-1} + \delta \log (USIRD)_{t-1} + \delta \log (GOCE)_{t-1} + \sum_t \dots (3.45)$$

Where:

t-1 = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 5A (World Bank and Erbe Approach)

$$\delta \log (GDP_{PRESAP}) = \phi_0 + \delta \log (EXDEBT)_{t-1} + \delta \log (DFI)_{t-1} + \delta \log (CAB)_{t-1} + \delta \log (RES)_{t-1} + \delta \log (RES)_{t-1} + \sum_t \dots (3.46)$$

Where:

t-1 = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 5B (Morgan Trust (1986) Approach)

$$\delta \log(GDP_{PRESAP}) = \alpha_0 + \delta \log(EXDEBT)_{t-1} + 2\delta \log(DFI)_{t-1} + 3\delta \log(CAB)_{t-1} + 4\delta \log(RES)_{t-1} + 5\delta \log(NEXTAS)_{t-1} + \epsilon_t + \sum_t \dots (3.47)$$

Where:

$t-1$ = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 6A (World Bank and Erbe Approach)

$$\delta \log(GDP_{PRESAP}) = \alpha_0 + \delta \log(EXDEBT)_{t-1} + 2\delta \log(DFI)_{t-1} + 3\delta \log(CAB)_{t-1} + 4\delta \log(RES)_{t-1} + \epsilon_t + \sum_t \dots (3.48)$$

Where:

$t-1$ = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

MODEL 6B (Morgan Trust (1986) Approach)

$$\delta \log(GDP_{PRESAP}) = \alpha_0 + \delta \log(EXDEBT)_{t-1} + 2\delta \log(DFI)_{t-1} + 3\delta \log(CAB)_{t-1} + 4\delta \log(RES)_{t-1} + 5\delta \log(NEXTAS)_{t-1} + \epsilon_t + \sum_t \dots (3.49)$$

Where:

$t-1$ = Meaning the were lagged by one period

ϵ_t = Error Correction Mechanism

\sum_t = White Noise Residual

3.11 Correlation Matrix

In addition to the Durbin–Watson statistics, the study also employed the use of correlation matrix to test for the presence of autocorrelation among the variables of the formulated model and shows the coefficient of correlation between pairs of variables. Correlation Matrix describes correlation among M variables. It is a

square symmetrical $M \times M$ matrix with the (ij) th element equal to the correlation coefficient r_{ij} between the (i) th and the (j) th variable. The diagonal elements (correlations of variables with themselves) are always equal to 1.00. It is of particular interest in empirical analysis to examine if independent variables have strong correlation with the dependent variable, thus correlation matrix helps to identify which of the independent variables may be relatively more important and those that are not important. Multicollinearity correlation among the independent variables can distort the standard error of the estimate and as such lead to incorrect conclusion. A common rule of thumb is that correlations among the independent variables between -0.70 and 0.70 do not cause difficulties. The usual remedy for multicollinearity is to drop one of the independent variables that are strongly correlated and recomputed the regression equation, (Robert, *et al*, 1999).

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CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

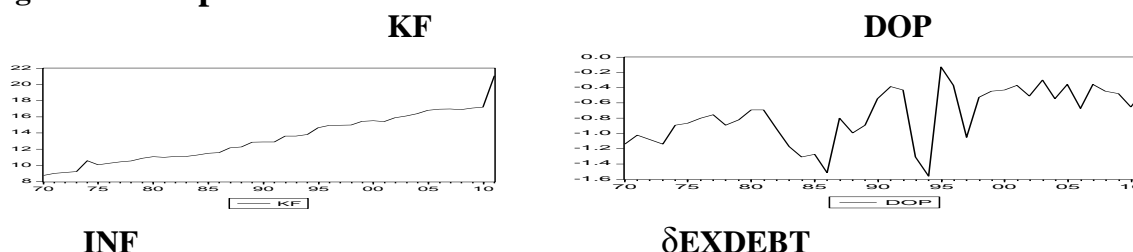
4.1 Data Presentation

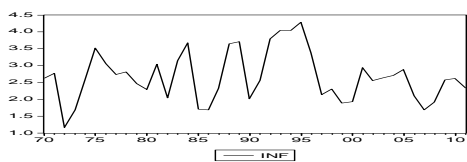
This section of the research deals extensively with the data presentation, interpretation and the discussions of findings. The estimated techniques outlined in the methodology were used. The study first tests for the short-run relationship in the models by the use of ordinary least square (OLS) method of regression analysis and also test for spuriousity of the OLS estimate using the unit root test, co-integration and Error Correction Mechanism. The Augmented Dickey Fuller (ADF) unit root tests of 1979 were employed to determine the stationarity of the variables by establishing the time properties of the variables in the models. The Johansen co-integration test is employed to test for the long-run relationship that exists among the variables and the error correction mechanism (ECM) to know the short-run adjustment dynamism of the models. The various sets of variables collated for analyses in this study are presented in the appendix (Appendix A1, page 172)

4.2 TREND ANALYSIS

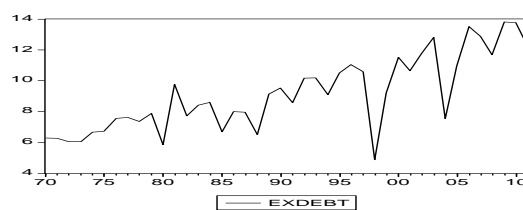
The graphical representation that shows the direction of movement of each variable as well as the relationship between each independent variable and the dependent variable are presented below. This is to show the trend and the nature of relationship which each variable exhibits with the dependent variable. The graphs show the trend of the time series variable over time; this gives the graphical illustration of how the variables behave over time.

Figure 4.1 Graphical Illustration of trend in each variable for the Models

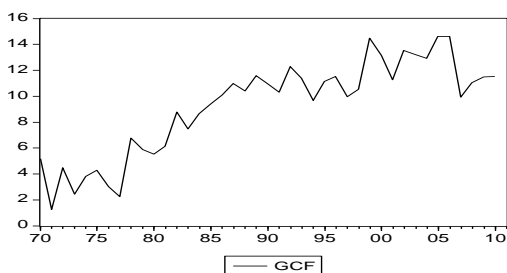




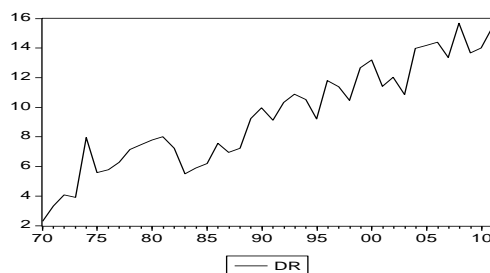
GCF



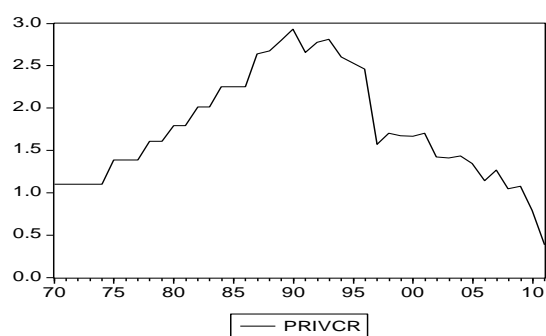
DR



RIVCR



USIRD



GOCE

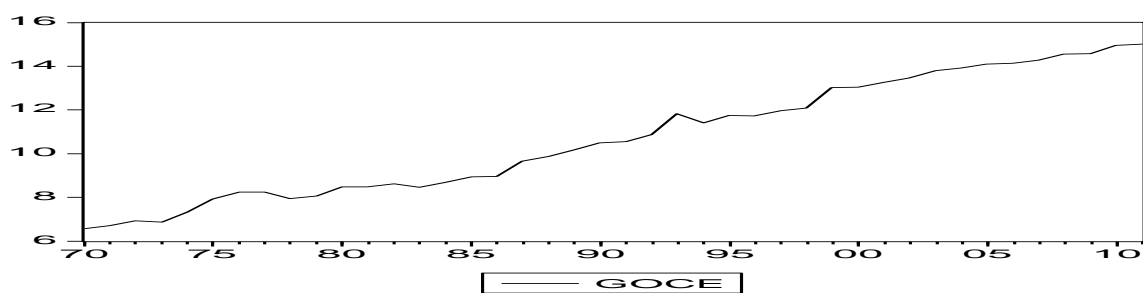
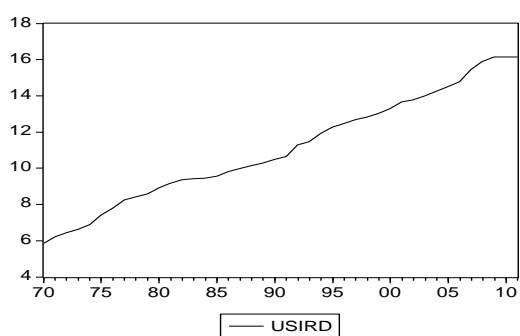
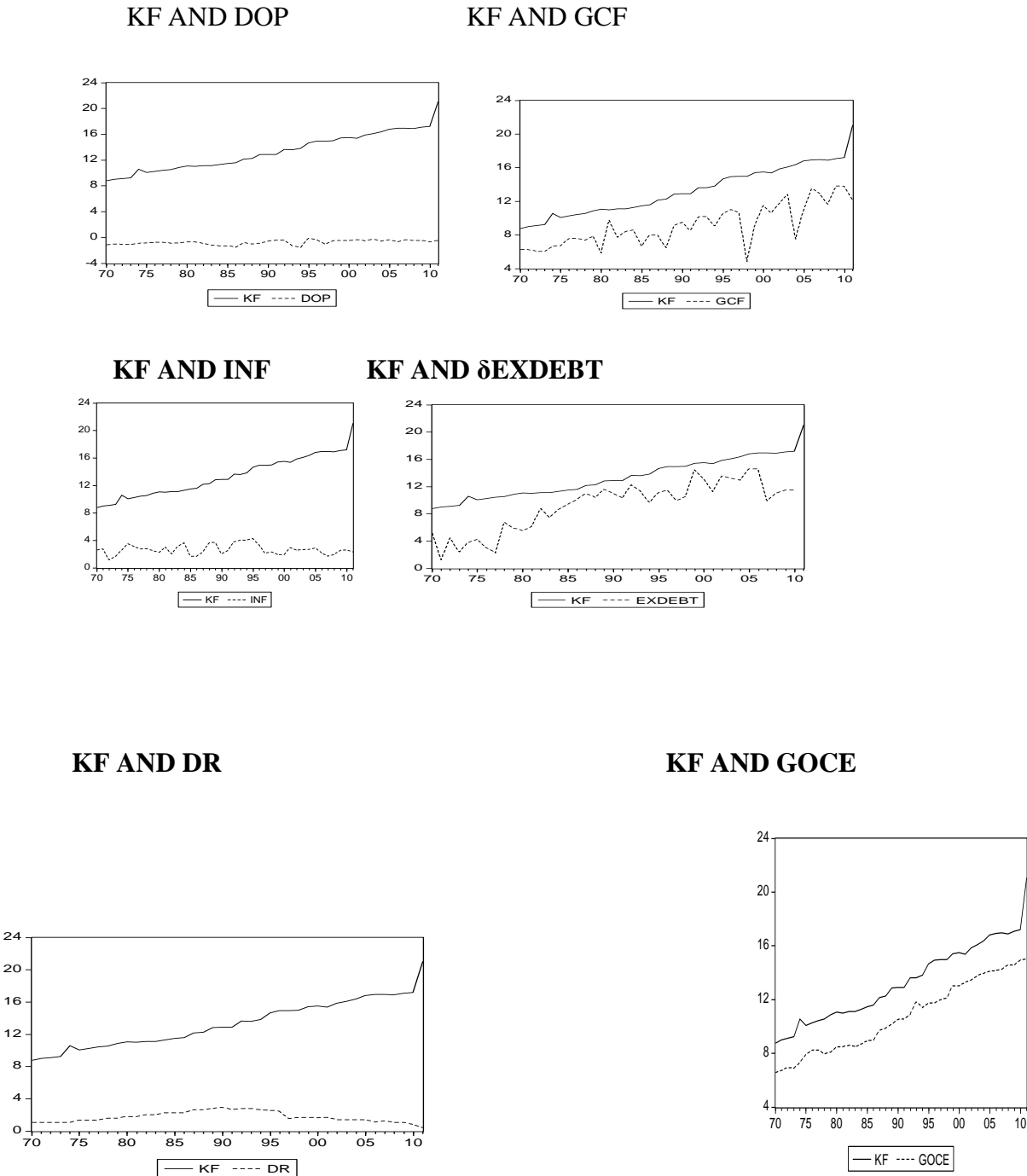


Figure 4.2 Graphical Illustration of the Relationship between each Independent Variable and capital flight for the models 1, 3 and 4



KF AND PRIVCR

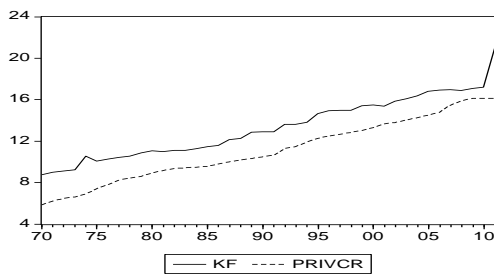
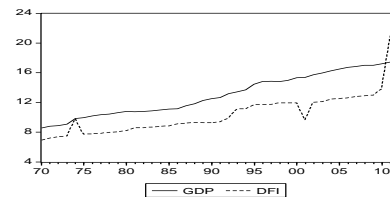


Figure 4. 2 Graphical Illustration of the Relationship between each Independent Variable and capital flight (Models 1, 3 and 4)

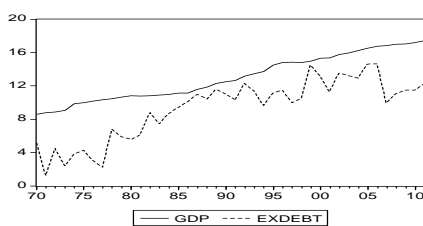
The above diagrams show a visual illustration of the time series data with the dependent variable, the graphs show the nature of relationship that exists between the independent and dependent variables. Thus, the graphical representations of the variables show the trend and behaviour of the variables over time.

Figure 4.3

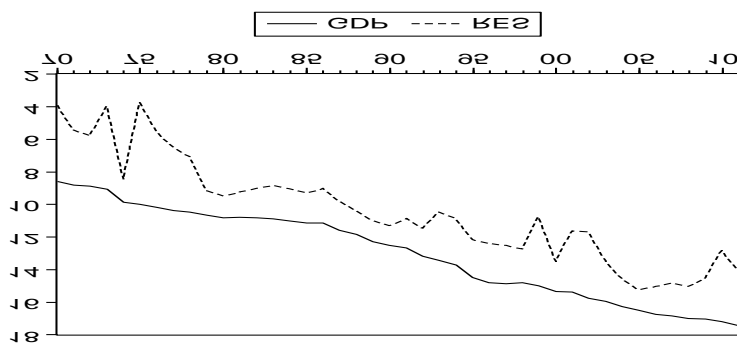
GDP AND DFI



GDP AND EXDEBT



GDP AND RES



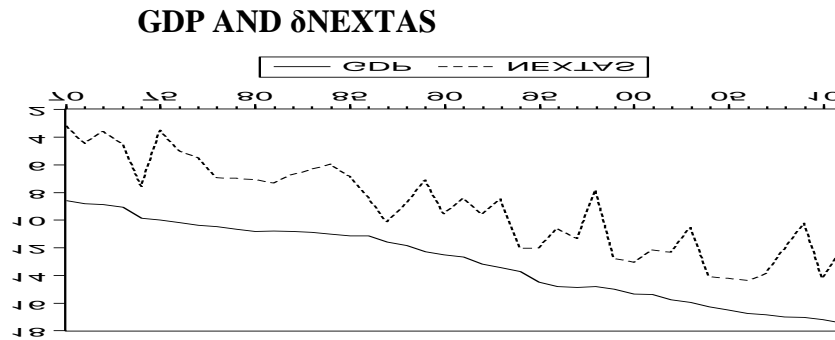
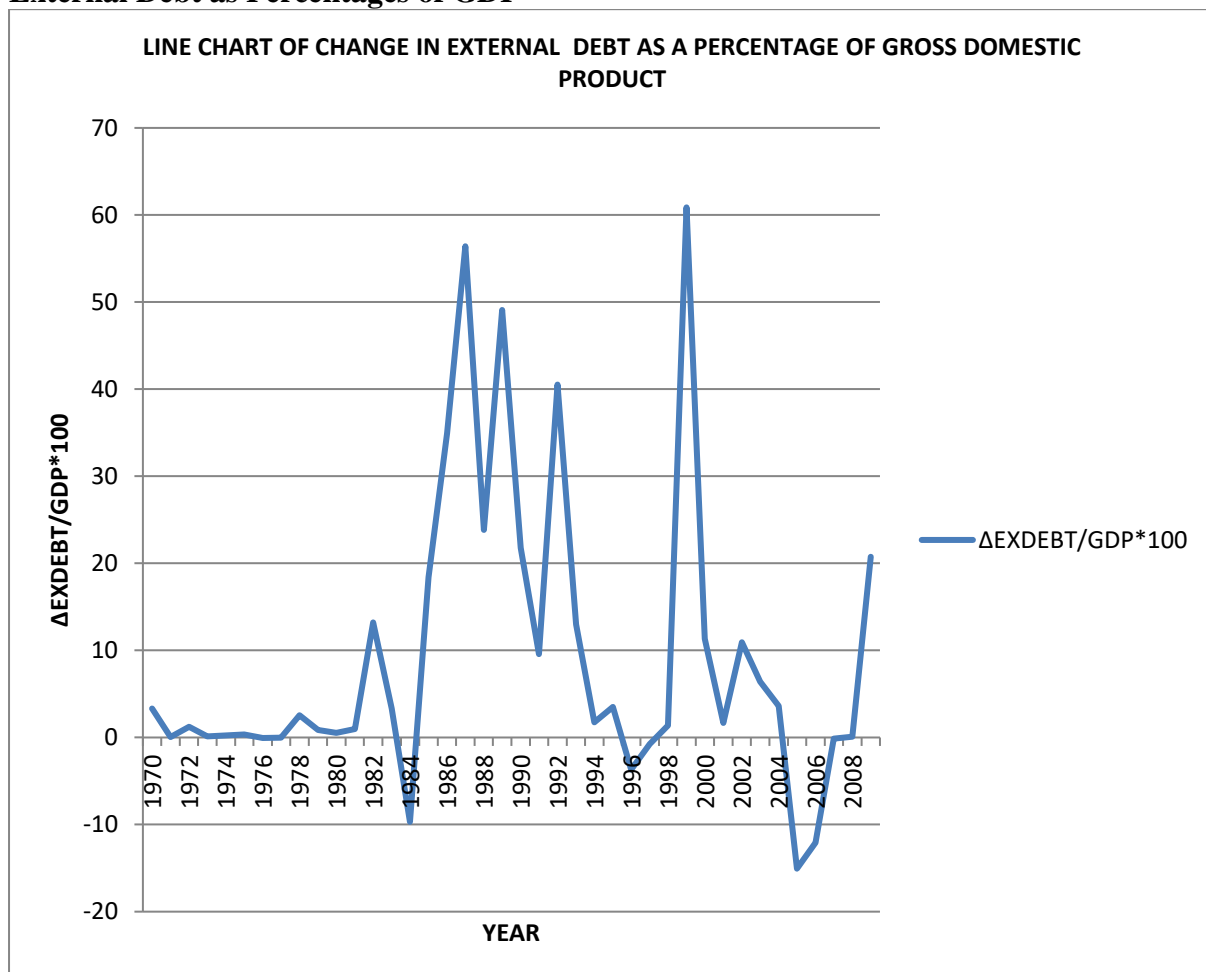


Figure 4.3: Graphical illustrations of the relationship between independent variables and gross domestic product (Models 2, 5 and 6)

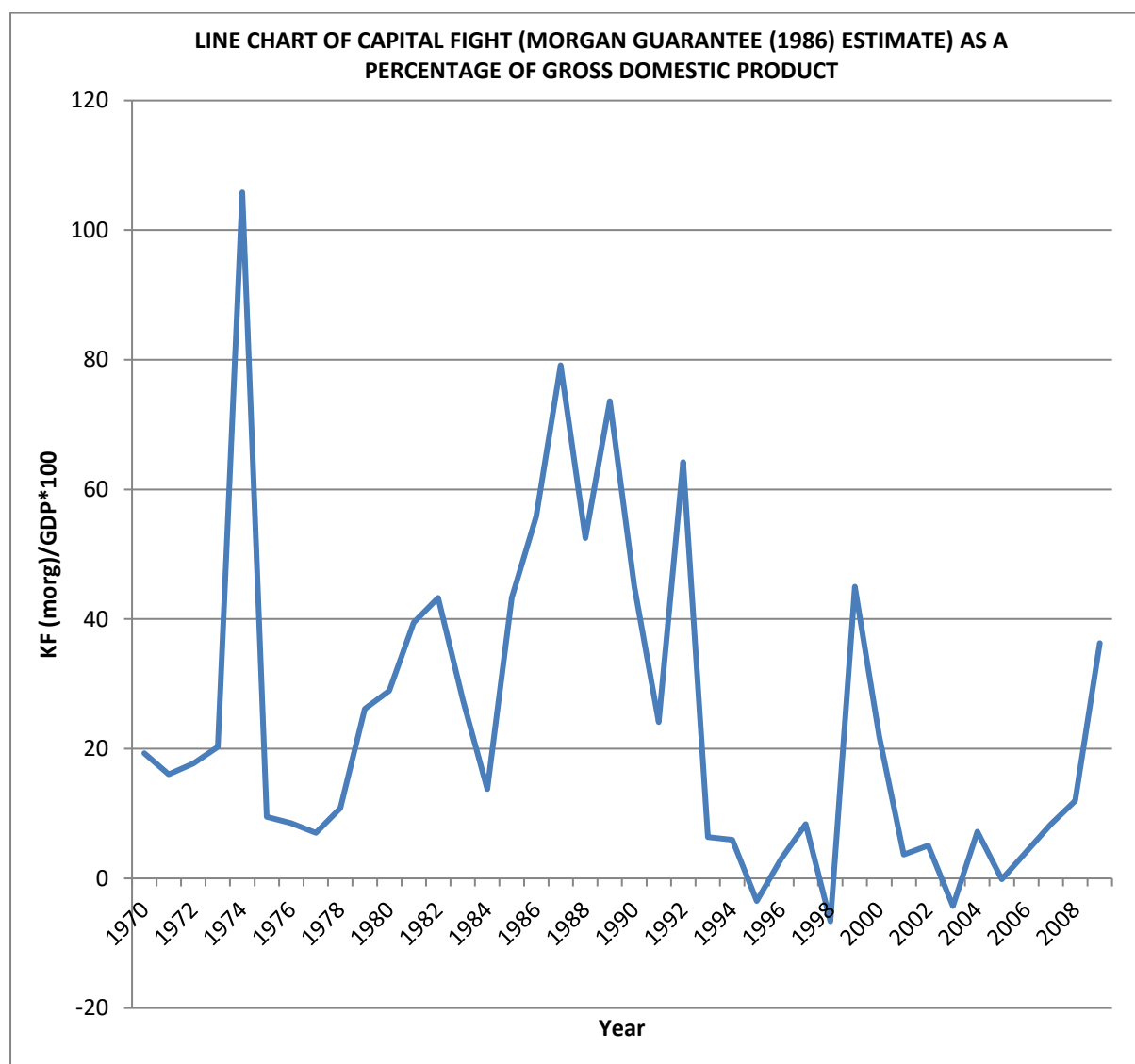
The above graphs show a visual illustration of trend in the time series data. The graphs show the nature of relationship that exists between the independent and dependent variables.

Figure 4.4: Line Charts of Capital Flight Estimates as Percentages of the GDP and Change in External Debt as Percentages of GDP



The above chart shows that capital flight was at the highest around the mid-1970s. This era marked the era of political unrest and the emergence of crude oil industry in Nigeria. The civil war seriously increased the political risk during the civil war and as such, high volume of capital flew out of the domestic economy. The periods of 1979 to 1983 that could be referred to as the eras of attempted democratic era showed a level of capital flight but latter peaked in 1984 due to military take over, political crises and policy distortion among others. The fact that illegal capital outflow still persists in Nigeria in the democratic regime shows that the nature of capital flight in Nigeria is multi dimension (political, economic and institutional factors) as revealed by the findings.

Figure 4.5: Line Chart of Capital Flight Morgan Guarantee (1986)



The above graph revealed that the Nigeria external debt rose sharply in the mid 70s and toward the end of year 2000s. An empirical relationship has been established between external debt and capital flight. This will in turn affect the level of economic developing (Ayadi 2008, Ajayi 2005). The Nigeria debt profile got to the peak in the late 1990s but reduced drastically during the Obasanjo regime between 2004 and 2005 due to debt reduction and forgiveness. However, the country's debt profile has been on the rise in the last few years without a corresponding effect on economic growth.

4.3 Presentation and Analysis of Results

The results and analyses of the formulated models are presented below in order to be able to establish short-run and long-run relationships among the variables.

4.3.1 The Short-Run Results

The results of the short-run analyses for the variables in each model are presented below:

Table 4.1 Presentation and Interpretation of Short run Results for Model 1A

DEPENDENT VARIABLE = KF (World Bank & Erbe 1985 approach)

Included observations: 42

INDEPENDENT VARIABLES	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	2.751495	2.065876	0.0468	Significant
δ EXTDEBT	0.261618	3.791814	0.0006	Significant
DOP	0.251213	0.462346	0.6469	Insignificant
INF	-0.067741	-0.369903	0.7138	Insignificant
GCF	-0.054248	-0.692447	0.4935	Insignificant
DR	-0.302774	-1.025468	0.3126	Insignificant
PRIVCR	0.089382	0.319630	0.7513	Insignificant
USIRD	-0.001360	-0.007358	0.9942	Insignificant
GOCE	0.610640	1.737584	0.0916	Significant

R-squared	0.955795	Mean dependent var	11.26291
Adjusted R-squared	0.945078	S.D. dependent var	2.891991
S.E. of regression	0.677750	Akaike info criterion	2.247333
Sum squared resid	15.15839	Schwarz criterion	2.619691
Log likelihood	-38.19400	F-statistic	89.18940
Durbin-Watson stat	1.594042	Prob(F-statistic)	0.000000

Source: Computation, using E-view statistical package

From the above table, the short-run relationship between capital flight and the explanatory variable can be expressed mathematically below:

$$KFW = 2.751495 + 0.261618EXTDEBT + 0.251213DOP - 0.067741INF - 0.054248GCF - 0.302774DR + 0.0089382PRIVCR - 0.001360 USIRD + 0.610640GOCE.....(4.1)$$

Table 4.1 shows the summary of the short-run analysis, test of significance of the explanatory variables and the test of hypothesis for the first model (Model 1A) which shows the determinant of capital flight using the World Bank and Erbe (1985) estimation approach.

From the table, the variable is significant in the model if the probability value is less than 5 %.

The results above show that the constant parameter is directly related with capital flight. It has a positive coefficient of 2.751495 which implies that if all explanatory variables are held constant in the short-run, capital flight will increase by 2.751495 units

Also, Change in External Debt ($\delta EXTDEBT$) showed a positive coefficient of **0.261618** which implies that a unit increase in the level of change in external debt will increase the value of capital flight by **0.261618** units. Degree of openness coefficient is 0.251213 which implies a positive relationship with the dependent variables. However, the inflation rate is negatively related to capital flight with value of -0.067741. Likewise, the gross capital formation shows a negative value of -0.054248 while the deposit rate revealed a negative value of -0.302774. This suggests that an increase in deposit rate will result in 0.302774 units decrease in the rate of capital flight. On the other hand, credit to the private sector (PRIVCR) with a positive value of 0.089382 is not appropriately signed because an increase in credit to private sector is expected to increase investment in the domestic economy and reduce capital flight.

Interest rate differential shows a negative value of -0.001360 while the government current expenditure is positively related with capital flight with a value of 0.610640.

Not all the explanatory variables are in conformity with the prior expectation in the short-run. Change in external debt, gross capital formation, deposit rate, private sector credit and government expenditure are expected to be negatively related to capital flight, this means that increase in these variables should bring down the level of capital flight. The degree of openness, inflation rate and interest rate differential are expected to be positively related to capital flight. Meanwhile, the coefficient of multiple determinants (R^2) showed a coefficient of 0.955795 which implies a 95.58% explanation of the behaviour of capital flight by the totality of the explanatory variables on the short-run. The Adjusted R^2 further proved this with the adjusted value of 0.945078 which implies a 94.51% explanation of the behaviour of gross domestic product by the totality of the explanatory variables with the remaining 4.42% behaviour attributed to other variables outside the model otherwise referred to as the stochastic variables.

Validation and testing of hypotheses:

The under listed hypotheses were tested under model 1A.

The hypothesis to be tested in this model is stated in the null form as follows;

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Political, Economic and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄: Capital flight cannot be stemmed nor reversed in Nigeria.

From the above analysis and the probability value, the constant parameter, Change in External Debt ($\delta EXDEBT$) and Government Current Expenditure ($GOCE$) are statistically significant in the model. This shows that these variables are the main determinant of Capital Flight in Nigeria in the short run. Rather than reducing the incidence of capital flight, these variables promote capital flight in Nigeria

For the decision on the hypotheses, the alternative hypothesis are accepted for the variables that are significant ($\delta EXDEBT$ and $GOCE$) while the null hypotheses are accepted for other variables (DOP , INF , DR , $PRIVCR$, $USIRD$ and GCF) in the model. Since debt volatility and Government current expenditure which are the proxies for political uncertainties, it is concluded from hypotheses 1 and 3 that political factors account for the level of capital flight in Nigeria within the period under investigation. These factors also influence the choice of private wealth holders in Nigeria within the period. Since the determinants of capital flight and the variables that influence the choice of private wealth holders have been ascertained, it is possible to stem and reverse the incidence of capital flight in Nigeria if appropriate actions in line with the recommendations of this study are taken. The F-statistic calculated value of 89.18940 which is greater than the F-tabulated value of 2.27 shows that the model is statistically.

Table 4.2 Presentation and Interpretation of Short run Results for Model 1B

DEPENDENT VARIABLE = KF (Morgan Guaranty Trust (1986) approach)

INDEPENDENT VARIABLES	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	1.709477	0.782754	0.4395	Insignificant
$\delta EXDEBT$	0.230579	2.010835	0.0528	Significant
DOP	-0.059823	-0.067143	0.9469	Insignificant
INF	-0.084413	-0.278443	0.7825	Insignificant
GCF	-0.023812	-0.185293	0.8542	Insignificant
DR	-0.134784	-0.277849	0.7829	Insignificant
PRIVCR	-0.042269	-0.090286	0.9286	Insignificant
USIRD	0.008644	0.028238	0.9776	Insignificant
GOCE	0.764468	1.305894	0.2009	Insignificant
R-squared	0.881447	Mean dependent var	10.98126	
Adjusted R-squared	0.851809	S.D. dependent var	2.885465	
S.E. of regression	1.110778	Akaike info criterion	3.239186	
Sum squared resid	39.48248	Schwarz criterion	3.615336	
Log likelihood	-57.40332	F-statistic	29.74016	
Durbin-Watson stat	1.482398	Prob(F-statistic)	0.000000	

Source: Computation, using E-view statistical package

The short-run relationship between capital flight and the explanatory variable can be expressed mathematically below:

$$KFM = 1.709477 + 0.230579_{EXTDEBT} - 0.059823_{DOP} - 0.084413_{INF} - 0.023812_{GCF} - 0.134784_{DR} + 0.0042269_{PRIVCR} - 0.008644_{USIRD} + 0.764468_{GOCE} \dots \dots \dots (4.2)$$

Table 4.2 shows the summary of the short-run analysis, test of significance of the explanatory variables and the test of hypothesis for the second equation in the first model which shows the determinant of capital flight based on Morgan Guaranty Trust (1986) of the residual estimate.

From the table, the level of significant is established if the probability value is less than 5 %.

Just like the result of the first equation of model 1, the constant parameter is positively related with capital flight but has a coefficient of 1.709477 which implies that if all explanatory variables are held constant in the short-run, capital flight will increase by 1.709477 units.

The Change in External Debt ($\delta EXTDEBT$) also showed a positive value of **0.230579** which indicates that a unit increase in the level of change in external debt will increase the value of capital flight by **0.230579** units. However, the degree of openness coefficient which was positively related to capital flight now shows a negative value of 0.059823 while the inflation rate maintain the same negative relationship with a value of -0.084413. Likewise, the gross capital formation shows a negative value of -**0.023812** and the deposit rate revealed a negative value of -**0.134784**. This also suggests that a unit increase in deposit rate will bring about an equivalent decrease of -**0.134784** in capital flight; this is in line with the expected result. Like the first equation, credit to the private sector ($PRIVCR$) is positively signed contrary to the expected result. Interest rate differential which showed a negative value in equation 4.1 is now appropriately signed with a positive value of 0.008644 while the government current expenditure maintained the same inappropriate positively sign of positive 0.764468. Thus many of the variables did not exhibit behaviours that are in line with the *apriori* expectation. For example, Change in external debt, gross capital formation, deposit rate, private sector

credit and government expenditure are all expected to be negatively related to capital flight but only gross capital formation and deposit rate are appropriately signed. This indicates that rather than reduce the level of capital flight within the period under study, Change in external debt, private sector credit and government current expenditure actually increased the level of capital flight within the period.

Mainwhile, the degree of openness, inflation rate and interest rate differential are expected to be positively related to capital flight are appropriately signed except the interest rate differential. The coefficient of multiple determinants (R^2) of 0.881447 (88.1%) and the adjusted R^2 of 0.851809 (85.2%) showed that the explanatory variables accounted for a substantial amount of behaviour of the dependent variable (capital flight). The F-statistic calculated value of 29.74016 which is greater than the F-tabulated value of 2.27 shows that the model is statistically significant

From the above result, it is observed that Morgan Trust (1986) estimation approach gives similar results as that of **World** Bank and Erbe (1985) estimation approach with the exception that the Degree of Openness (DOP) which was positively signed significant under the World Bank and Erbe approach is now negatively signed under the Morgan Trust (1986) estimation approach. So also is the interest rate differential which was positively related in equation 4.1 is now negatively related with capital flight. Also the World Bank and Erbe approach revealed that two variables namely: change in external debt and government current expenditure are the main determinants of capital flight, the Morgan Guaranty Trust (1986) estimation approach confirmed that change in external debt is the main determinant of capital flight for the period under study.

Validation and testing of hypotheses:

Just like equation 4.1, the under listed hypotheses were tested under model 1B.

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Political, Economic and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

From the above analysis and the probability value, the constant parameter, Change in External Debt ($\delta EXDEBT$) is the only statistically significant variable in the model. This shows that change in external debt is the main determinant of Capital Flight in Nigeria in the short run. Rather than reducing the incidence of capital flight, it has led to capital flight in Nigeria due to political and economic uncertainties

For the decision on the hypotheses, the alternative hypothesis is accepted for change in external debt ($\delta EXDEBT$) while the null hypotheses are accepted for other variables (GCF, DOP, INF, DR, PRIVCR, USIRD and GCF) in the model. Since debt volatility which is a variable for political uncertainty, it is concluded from hypotheses 1 and 3 that political uncertainties account for the level of capital flight in Nigeria. This variable also influences the choice of private wealth holders in Nigeria. Since the determinant of capital flight and the variables that influence the choice of private wealth holders have been identify, it is possible to stem and reverse the incidence of capital flight in Nigeria if appropriate actions in line with the recommendations of this study are taken.

Table 4.3 Presentation and Interpretation of Short run Results for Model 2A

DEPENDENT VARIABLE = GDP (World Bank & Erbe 1985 approach)

INDEPENDENT VARIABLE	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	2.831836	8.317620	0.0000	Significant
$\delta EXDEBT$	0.060261	2.145280	0.0386	Significant
DFI	0.613180	9.752797	0.0000	Significant
CAB	0.151818	2.658075	0.0115	Significant
δRES	0.198151	3.236736	0.0026	Significant
R-squared	0.980398	Mean dependent var	12.99879	
Adjusted R-squared	0.978279	S.D. dependent var	2.778640	
S.E. of regression	0.409521	Akaike info criterion	1.163689	
Sum squared resid	6.205190	Schwarz criterion	1.370554	
Log likelihood	-19.43746	F-statistic	462.6337	
Durbin-Watson stat	1.752369	Prob(F-statistic)	0.000000	

Source: Computation, using E-view statistical package

The short-run relationship between gross domestic product and the explanatory variable can be expressed mathematically below as:

$$GDP=2.831836+0.0613180_{EXTDEBT}+0.151818_{DFI}+0.198151_{CAB}+2.1831836_{RES}...(4.3)$$

The analyses from Table 4.3 show that all the variables are positively related to dependent variable (Gross Domestic Product) and are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run in conformity with the expected results.

The result shows that the constant parameter is directly related with gross domestic product. It has a positive coefficient of 2.831836 which implies that if all explanatory variables are held constant in the short-run, gross domestic product will increase by 2.831836 units

Also, Change in External Debt ($\delta EXTDEBT$) showed a positive coefficient of 0.0613180 which implies that a unit increase in the level of change in external debt will increase the value of gross domestic product by 0.0613180 units. Direct Foreign Investment coefficient of 0.151818 implies that an increase in the direct foreign investment will result into 0.151818 units increase in the value of Gross domestic product. Also, the Current Account Balance (CAB) of 0.198151 denotes that an increase in the level of current account will result in 0.198151i ncrease in Gross Domestic Product so also is a unit increase in the change in foreign reserve will lead to a 2.1831836 increase in Gross Domestic Product

The coefficient of multiple determinants (R^2) showed a coefficient of 0.980398 which implies a 98.04% explanation of the behaviour of gross domestic product by the totality of the explanatory variables ($\delta EXTDEBT$, DFI, CAB and δRES) in the short-run. The Adjusted R^2 further proved this with the adjusted value of **Adjusted** 0.978279 which implies a 97.83% explanation of the behaviour of gross domestic product by the totality of the explanatory variables with the remaining 1.87% behaviour attributed to other variables outside the model otherwise referred to as the stochastic variables.

Validation and testing of hypotheses: The hypothesis below was tested under model 2A wich examine the effect of capital flight on economic growth.

The hypothesis is re-stated in the null form as follows;

H₀₃: Capital flight has no significant effect on the Nigeria's economic growth.

The probability values from the table show that the alternative hypothesis is accepted for all the variables because they are all significant in explaining the behaviour of the dependent variable. Since all the probability values of all the variables are less than 5%, the alternative hypothesis is accepted for all the variables. This confirmed that the variables positively impact Economic Growth in the short run.

Table 4.4 Presentation and Interpretation of Short run Results for Model 2B

DEPENDENT VARIABLE = GDP (Morgan Guaranty Trust (1986) approach)

INDEPENDENT VARIABLE	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	2.836515	8.170538	0.0000	Significant
δ EXTDEBT	0.059176	1.985894	0.0547	Significant
DFI	0.611646	9.420443	0.0000	Significant
CAB	0.149739	2.483446	0.0178	Significant
δ RES	0.194025	2.752518	0.0092	Significant
δ NEXTAS	0.008570	0.123354	0.9025	Insignificant
R-squared	0.980406	Mean dependent var	12.99879	
Adjusted R-squared	0.977685	S.D. dependent var	2.778640	
S.E. of regression	0.415083	Akaike info criterion	1.210885	
Sum squared resid	6.202568	Schwarz criterion	1.459124	
Log likelihood	-19.42859	F-statistic	360.2594	
Durbin-Watson stat	1.739756	Prob(F-statistic)	0.000000	

Source: Computation, using E-view statistical package

From the above table, it could be inferred that the short-run relationship between gross domestic product and the explanatory variable can be expressed mathematically below as:

$$\text{GDP} = 2.836515 + 0.059176\delta\text{EXTDEBT} + 0.611646\text{DFI} + 0.149739\text{CAB} + 0.194025\delta\text{RES} + 0.008570\delta\text{NEXTAS} \dots\dots\dots(4.4)$$

The analyses from Table 4.4 show that just like the World Bank and Erbe (1985) approach, all the variables are positively related to dependent variable (Gross Domestic Product) and are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run in conformity with the expected results except the change in net foreign assets of domestic banks that is not statistically significant in explaining the behaviour of the dependent variable.

The result shows that the constant parameter is directly related with gross domestic product. It has a positive coefficient of 2.836515 which implies that if all explanatory variables are held constant in the short-run, gross domestic product will increase by same units

Change in External Debt ($\delta\text{EXTDEBT}$) showed that a unit increase in debt acquisition will lead to a 0.059176 increase in Gross Domestic Product in the short run. In like manner, a unit increase in DFI will contribute about 0.611646 values to the Gross domestic product. While a unit increase in current account balance, change in reserve and net foreign assets of domestic banks will contribute 0.149739, 0.194025 and 0.008570 respectively to the Gross Domestic Product each.

The coefficient of multiple determinants (R^2) showed a coefficient of 0.980406 which implies a 98.04% explanation of the behaviour of gross domestic product by the totality of the explanatory variables ($\delta\text{EXTDEBT}$, DFI, CAB, δRES and δNEXTAS) on the short-run. The Adjusted R^2 further prove this with the adjusted value of 0.977685 which implies a 97.77% explanation of the behaviour of gross domestic product by the totality of the explanatory variables with the remaining 1.86% behaviour attributed to other variables outside the model otherwise referred to as the stochastic variables.

Validation and testing of hypotheses: The hypothesis below was tested under Model 2B (Morgan Guaranty Trust version of (1986) of model 2 which examines the effect of capital flight on economic growth. The hypothesis is re-stated in the null form as follows;

H₀₃: Capital flight has no significant effect on the Nigeria's economic growth.

The probability values from the table show that the alternative hypothesis is accepted for all the variables (except the net foreign asset of domestic bank (δNEXTAS) with probability value of 0.9025) because they are all significant in explaining the behaviour of the dependent variable. Since all the probability values of all the variables are less than 5%, the alternative hypothesis is accepted for all the variables. This confirmed that the variables positively impact Economic Growth in the short run.

Table 4.5 Presentation and Interpretation of PRE-SAP Short run Results for Model 3A. (World Bank & Erbe 1985 approach)

DEPENDENT VARIABLE = KF

INDEPENDENT VARIABLES	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	4.926130	1.705309	0.1319	Insignificant
ΔEXTDEBT	0.117314	1.558605	0.1631	Insignificant
DOP	-0.239300	-0.234552	0.8213	Insignificant
INF	-0.151389	-0.726356	0.4912	Insignificant
GCF	0.070704	0.507973	0.6271	Insignificant
DR	0.793791	0.498834	0.6332	Insignificant
PRIVCR	0.096335	0.161905	0.8760	Insignificant
USIRD	-0.081020	-0.688085	0.5135	
GOCE	0.047841	0.129599	0.9005	

R-squared	0.942069	Mean dependent var	8.174269
Adjusted R-squared	0.875862	S.D. dependent var	0.826556
S.E. of regression	0.291223	Akaike info criterion	0.668864
Sum squared resid	0.593674	Schwarz criterion	1.103445
Log likelihood	3.649089	F-statistic	14.22912
Durbin-Watson stat	1.948549	Prob(F-statistic)	0.001093

Source: Computation, using E-view statistical package

The short-run relationship between capital flight and the explanatory variable in the pre- SAP era is expressed mathematically as shown below:

$$KFW_{PRESAP} = 4.926130 + 0.117314EXTDEBT - 0.239300DOP - 0.151389INF + 0.070704GCF + 0.793791DR + 0.096335PRIVCR - 0.081020USIRD + 0.047841GOCE \dots\dots\dots(4.5)$$

The above result shows the summary of the short-run analysis for the Pre-SAP era, the Pre- SAP era was the era of controlled or guided economy when the prices of economic variables were fixed by the regulatory authorities. The probabilities values show that none of the variable is significant in determining the

behaviour of the dependent variable during the Pre- SAP era. This is because all the probability values of the variables are greater than 5 %.

The results however showed that the constant parameter is directly related with capital flight. It has a positive coefficient of **4.926130**. This implies that if all explanatory variables are held constant in the short-run, capital flight will increase by **4.926130** units.

Also, Change in External Debt ($\delta\text{EXTDEBT}$) showed a positive coefficient of **0.117314** which implies that a unit increase in the level of change in external debt will increase the value of capital flight by **0.117314** units. Degree of openness has a coefficient of negative **0.239300**. The inflation rate on the other hand showed a negative relationship with capital flight with a value of **0.151389**. Likewise, the gross capital formation shows a positive value of **0.070704** while the deposit rate revealed a positive value of **0.793791**. This suggests that an increase in deposit rate will result in **0.793791** units increase in the rate of capital flight while the credit to the private sector (PRIVCR) with a positive value of **0.096335** revealed that increase in credit to private sector will also cause capital flight to increase by **0.096335**; this is contrary to the expected result. Interest rate differential shows a negative value of **0.081020** while the government current expenditure is positively related with capital flight with a value of **0.047841**.

Although the variables are not statistically significant as revealed by the probability values, the coefficient of multiple determinants R^2 of 94% showed that about 94% of the behaviour of capital flight was explained by the independent variables in the short-run. The **f-statistic value of 14.22912** which is greater than the F-tabulated value of 2.27 shows that the model is statistically significant.

Validation and testing of hypotheses:

The under listed hypotheses were tested under model 3A.

The hypothesis to be tested in this model is stated in the null form as follows;

H_{01} : Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Political, Economic and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

Since the probability value of all the explanatory variables are greater than 5% and not significant in the model, the null hypotheses are accepted for all variables in the short run under the World Bank & Erber (1985) approach.

Table 4.6 Presentation and Interpretation of PRE-SAP Short run Results for Model 3B (Morgan Guaranty Trust (1986) approach)

DEPENDENT VARIABLE = KF

INDEPENDENT VARIABLES	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	3.259558	0.406041	0.6988	Insignificant
δEXTDEBT	0.100719	0.534909	0.6119	Insignificant
DOP	-1.439851	-0.546715	0.6043	Insignificant
INF	-0.300385	-0.567816	0.5908	Insignificant
GCF	0.158665	0.456092	0.6644	Insignificant
DR	1.558871	0.380741	0.7165	Insignificant
PRIVCR	-0.453457	-0.303892	0.7715	Insignificant
USIRD	-0.165529	-0.521915	0.6204	Insignificant
GOCE	0.455421	0.401574	0.7019	Insignificant
R-squared	0.762678	Mean dependent var	7.870546	
Adjusted R-squared	0.446248	S.D. dependent var	0.975560	
S.E. of regression	0.725959	Akaike info criterion	2.481062	
Sum squared resid	3.162095	Schwarz criterion	2.905892	
Log likelihood	-9.607963	F-statistic	2.410257	
Durbin-Watson stat	2.058431	Prob(F-statistic)	0.149897	

Source: Computation, using E-view statistical package

The short-run relationship between capital flight and the explanatory variable in the Post-SAP era can be expressed mathematically below:

$$KFM_{PRESAP} = 3.259558 + 0.100719_{EXTDEBT} - 1.439851_{DOP} - 0.300385_{INF} + 0.158665_{GCF} + 1.558871_{DR} - 0.453457_{PRIVCR} - 0.165529_{USIRD} + 0.455421_{GOCE} \dots \dots \dots (4.6)$$

The above result shows the summary of the short-run analysis for the Pre-SAP era, just like the World Bank and Erbe (1985), the Morgan Guaranty Trust of 1986 approach gave a similar probability values for the explanatory variables. The probability values show that none

of the variable is significant in determining the behaviour of the dependent variable during the Post- SAP era. This is because all the probability values of the variables are greater than 5 %.

The results however showed that the constant parameter is directly related with capital flight. It has a positive coefficient of 3.259558. This implies that if all explanatory variables are held constant in the short-run, capital flight will increase by 3.259558 units.

Again, Change in External Debt ($\delta EXTDEBT$) showed a positive coefficient of **0.100719** which implies that a unit increase in the level of change in external debt will increase the value of capital flight by **0.100719** units. Degree of openness has a coefficient of negative 1.439851. The inflation rate on the other hand showed a negative relationship with capital flight with a value of **0.300385**. Equally, the gross capital formation shows a positive value of **0.158665** while the deposit rate revealed a positive value of 1.558871. This suggests that an increase in deposit rate will result in 1.558871units increase in the rate of capital flight while the credit to the private sector (PRIVCR) with a negative value of **0.453457 revealed that** increase in credit to private sector will also cause capital flight to increase by **0.453457** this is contrary to the expected result. Interest rate differential shows a negative value of **0.165529** while the government current expenditure is positively related with capital flight with a value of **0.455421**.

The coefficient of multiple determinants R^2 of 94% showed that about 76% of the behaviour of capital flight was explained by the independent variables in the short-run. The **f-statistic value of**

2.455421 which is greater than the F-tabulated value of 2.27 shows that the model is statistically significant.

Validation and testing of hypotheses:

The under listed hypotheses were tested under model 3B.

The hypothesis to be tested in this model is stated in the null form as follows;

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Macroeconomic, Political and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

Since the probability value of all the explanatory variables are greater than 5% and not significant in the model, the null hypotheses are accepted for all variables in the short run under the World Bank & Erber (1985) approach.

The short term results of model 3 which examined the determinants of capital flight in Pre-SAP era revealed that the government policy of fixed and strict control of economic variables had no strong link with the rate capital flight in Nigeria within the period.

Table 4.7 Presentation and Interpretation of Post-SAP Short run Results for Model 4A (World Bank & Erbe (1985) approach)

DEPENDENT VARIABLE = KF

INDEPENDENT VARIABLES	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	1.953374	0.311318	0.7596	Insignificant
ΔEXTDEBT	0.436002	3.033833	0.0079	Significant
DOP	0.607809	0.662893	0.5168	Insignificant
INF	-0.225469	-0.687183	0.5018	Insignificant
GCF	-0.073375	-0.689006	0.5007	Insignificant
DR	0.133897	0.135099	0.8942	Insignificant

PRIVCR	1.171950	1.382751	0.1857	Insignificant
USIRD	-0.145371	-0.268327	0.7919	Insignificant
GOCE	-0.579585	-0.700069	0.4939	Insignificant

R-squared	0.851692	Mean dependent var	13.31938
Adjusted R-squared	0.777538	S.D. dependent var	1.711771
S.E. of regression	0.807372	Akaike info criterion	2.683648
Sum squared resid	10.42958	Schwarz criterion	3.122443
Log likelihood	-24.54559	F-statistic	11.48545
Durbin-Watson stat	2.170467	Prob(F-statistic)	0.000025

Source: Computation, using E-view statistical package

The short-run relationship between capital flight and the explanatory variable in the Post-SAP era can be expressed mathematically below:

$$KFW_{PostSAP} = 1.953374 + 0.436002EXTDEBT + 0.607809DOP - 0.225469INF - 0.073375GCF + 0.133897DR - 1.171950PRIVCR - 0.145371USIRD - 0.579585GOCE \dots \dots \dots (4.7)$$

The above result shows the summary of the short-run analysis for the Post-SAP era, the Post-SAP era signifies the era of deregulation and liberalisation of the financial sector and the economy as a whole. The probability values show that only change in external debt is statistically significant in explaining the behaviour of the dependent variable (capital flight) because only its probability value is less than 5 % while the probability values of other variables are greater than 5 %. The constant parameter is positively related to the dependent variable and has a value of 1.953374.

Change in External Debt ($\delta EXTDEBT$), Degree of Openness (DOP) and Deposit Rate (DR) are positively signed while Inflation rate (INF), Gross capital formation (GCF), Private sector credit (PRIVCR), Interest rate differential (USIRD) and Government current expenditure (GOCE) are negatively signed. A change in any of the positively signed variable will lead to increase rate of capital flight and a change in any of the negatively signed variables will reduce the rate of capital flight in Nigeria.

The coefficient of multiple determinants R^2 of 0.851692 showed that about 85% of the behaviour of capital flight was explained by the independent variables in the short-run. The **f-statistic value of 11.48545 that is** greater than the F-tabulated value of 2.27 shows that the model is statistically significant.

Validation and testing of hypotheses:

The under listed hypotheses were tested under model 4.

The hypothesis to be tested in this model is stated in the null form as follows;

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Macroeconomic, Political and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

Since the probability value of all the explanatory variables except the change in external debt are greater than 5% and not significant in the model, the alternative hypothesis is accepted for the variables while the null hypotheses are accepted for the remaining variables in the short run under the World Bank & Erber (1985) approach. From the hypothesis, debt volatility is the major political variable that determines the rate of capital flight, political uncertainty is the major factor that influences the choice of wealth holders in Nigeria, capital flight can be reverse in Nigeria if there is political stability and the borrowed funds are adequately utilized for the intended purposes.

Table 4.8 Presentation and Interpretation of Post-SAP Short run Results for Model 4B (Morgan Guaranty Trust (1986) approach)

DEPENDENT VARIABLE = KF

INDEPENDENT VARIABLES	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	8.188526	0.799965	0.4354	Insignificant
ΔEXTDEBT	0.345730	1.474641	0.1597	Insignificant
DOP	0.594526	0.397460	0.6963	Insignificant
INF	-0.146992	-0.274614	0.7871	Insignificant
GCF	0.011961	0.068846	0.9460	Insignificant
DR	-0.630047	-0.389673	0.7019	Insignificant
PRIVCR	0.933646	0.675247	0.5092	Insignificant
USIRD	-0.089968	-0.101794	0.9202	Insignificant

GOCE	-0.760191	-0.562849	0.5813	Insignificant
R-squared	0.626993	Mean dependent var	12.93480	
Adjusted R-squared	0.440490	S.D. dependent var	1.760855	
S.E. of regression	1.317127	Akaike info criterion	3.662495	
Sum squared resid	27.75716	Schwarz criterion	4.101290	
Log likelihood	-36.78119	F-statistic	3.361834	
Durbin-Watson stat	1.935708	Prob(F-statistic)	0.018642	

Source: Computation, using E-view statistical package

The relationship between capital flight and the explanatory variable in the Post-SAP era in the short-run can be expressed mathematically below:

$$KFW_{PostSAP} = 8.188526 + 0.345730EXTDEBT + 0.594526DOP - 0.146992INF + 0.011961GCF - 0.630047DR + 0.933646PRIVCR - 0.089968USIRD - 0.760191GOCE \dots \dots \dots (4.8)$$

The above result shows the summary of the short-run analysis for the Post-SAP era under Morgan Guaranty Trust (1986) approach. The probability values show that none of the explanatory variables is statistically significant in predicting the behaviour of capital flight during the period. However, the constant parameter is positively related to the dependent variable and has a value of 8.188526.

Change in External Debt ($\delta EXTDEBT$), Degree of Openness (DOP), Gross Capital Formation (GCF) and Private sector credit (PRIVCR) are positively signed while Inflation rate (INF), Interest rate differential (USIRD) and Government current expenditure (GOCE) are negatively signed. A change in any of the positively signed variable will lead to increase rate of capital flight and a change in any of the negatively signed variables will reduce the rate of capital flight in Nigeria.

The coefficient of multiple determinants R^2 of 0.626993 showed that about 63% of the behaviour of capital flight was explained by the independent variables in the short-run. F-statistic value of 3.361834 which is greater than the F-tabulated value of 2.27 shows that the model is statistically significant.

Validation and testing of hypotheses:

The under listed hypotheses were tested under model 4.

The hypothesis to be tested in this model is stated in the null form as follows;

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Macroeconomic, Political and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

Since none of the the probability values the explanatory variables is significant, the null hypotheses are accepted for all the explanatory variables (Change in External Debt ($\delta\text{EXTDEBT}$), Degree of Openness (DOP), Gross Capital Formation (GCF), Private sector credit (PRIVCR), Inflation rate (INF), Interest rate differential (USIRD) and Government current expenditure (GOCE). From the analysis of model 4 (World Bank (1985) & Morgan Guaranty Trust (1986) approaches), debt volatility which is a major political variable that influenced the level of capital flight from Nigeria during the change of policy (ie pre and post SAP).

Table 4.9 Presentation and Interpretation of Pre-SAP Short run Results for Model 5A (World Bank & Erbe 1985 approach)

DEPENDENT VARIABLE = GDP

INDEPENDENT VARIABLE	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	-2.574726	-2.086543	0.0610	Significant
$\delta\text{EXTDEBT}$	-0.093313	-2.342966	0.0390	Significant
DFI	1.493692	8.561991	0.0000	Significant
CAB	-0.012379	-0.362955	0.7235	Insignificant
δRES	0.227284	5.797596	0.0001	Significant

R-squared	0.975072	Mean dependent var	10.13532
Adjusted R-squared	0.966007	S.D. dependent var	0.858322
S.E. of regression	0.158250	Akaike info criterion	-0.598980
Sum squared resid	0.275472	Schwarz criterion	-0.357546
Log likelihood	9.791842	F-statistic	107.5680
Durbin-Watson stat	1.125525	Prob(F-statistic)	0.000000

Source: Computation, using E-view statistical package

The short-run relationship between gross domestic product and the explanatory variable can be expressed mathematically belowb as:

$$GDP_{PRESAP} = -2.574726 - 0.093313\delta\text{EXTDEBT} + 1.493692\text{DFI} - 0.012379\text{CAB} + 0.227284\delta\text{RES} \dots\dots (4.9)$$

The analyses from Table 4.8 show that the constant parameter, change in external debt ($\delta EXTDEBT$) and current account balance (CAB) are negatively related to the dependent variable while the direct foreign investment (DFI) and change in reserve (δRES) are positively related to the dependent variable (Gross Domestic Product). All the explanatory variables except the current account balance (CAB) are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run in conformity with the expected results.

The result shows that a unit change in the constant parameter will lead to a decrease of 2.574726 in Gross domestic products. The result also reveals that an increase in change in external debt will reduce the level of capital flight while increase in DFI will brought about increase in GDP and vice versa. Increase in current account balance (CAB) will lead to reductuion in GDP while a change in external reserves will lead to increase level of Gross Domestic Product.

The Adjusted R^2 of 0.975072 reveals that about 98% of the behaviour of Gross Domestic Product is explained by the independent variables. This was further proved with the adjusted value of 0.966007 which implies that 97% explanation of the behaviour of gross domestic product by the totality of the explanatory variables.

Validation and testing of hypotheses: Hypothesis 2 was tested under model 5 wich examine the effect of capital flight on economic growth during the Pre-SAP period.

The hypothesis is re-stated in the null form as follows;

H₀₂: Capital flight has no significant effect on the Nigeria's economic growth.

The probability values from table 4.8 show that the alternative hypothesis is accepted for all the variables with the exception of current account balance (CAB) because they are all significant in explaining the behaviour of the dependent variable as shown in the probability values. Thus, the alternative hypothesis is accepted for Change in External Debt ($\delta EXTDEBT$), direct foreign investment (DFI) and change in reserve (δRES) while the null hypothesis is accepted for the current account balance (CAB).

Table 4.10 Presentation and Interpretation of Pre-SAP Short run Results for Model 5B (Morgan Guaranty Trust (1986) approach)

DEPENDENT VARIABLE = GDP

INDEPENDENT VARIABLE	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	-2.467560	-1.983916	0.0754	Insignificant
$\delta EXTDEBT$	-0.087317	-2.157627	0.0563	Significant
DFI	1.479476	8.417658	0.0000	Significant
CAB	-0.001759	-0.048881	0.9620	Insignificant
δRES	0.256220	5.162468	0.0004	Significant
$\delta NEXTAS$	-0.044703	-0.956860	0.3612	Insignificant
R-squared	0.977163	Mean dependent var	10.13532	
Adjusted R-squared	0.965744	S.D. dependent var	0.858322	
S.E. of regression	0.158860	Akaike info criterion	-0.561586	
Sum squared resid	0.252366	Schwarz criterion	-0.271866	
Log likelihood	10.49269	F-statistic	85.57711	
Durbin-Watson stat	1.211928	Prob(F-statistic)	0.000000	

Source: Computation, using E-view statistical package

The short-run relationship between gross domestic product and the explanatory variable can be expressed mathematically belowb as:

$$GDP_{PRESAP} = -2.467560 - 0.087317\delta EXTDEBT + 1.479476DFI - 0.001759CAB + 0.256220\delta RES - 0.044703\delta NEXTAS \dots\dots\dots (4.10)$$

The analyses from Table 4.10 show that the constant parameter, change in external debt ($\delta EXTDEBT$), current account balance (CAB) and net foreign asset of domestic banks ($\delta NEXTAS$) are negatively related to the dependent variable while the direct foreign investment (DFI) and change in reserve (δRES) are positively related to the dependent variable (Gross Domestic Product). All the explanatory variables except the current account balance (CAB) and net foreign asset of domestic banks ($\delta NEXTAS$) are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run in conformity with the expected results.

The result shows that a unit change in the constant parameter will lead to a decrease of 2.574726 in Gross domestic products. The result also reveals that an increase in change in external debt will

reduce the level of capital flight while increase in DFI will brought about increase in GDP and vice versa. Increase in current account balance (CAB) and net foreign asset of domestic banks (δ NEXTAS) will lead to reduction in GDP while a change in external reserves will lead to increase level of Gross Domestic Product.

The Adjusted R^2 of 0.977163 reveals that about 98% of the behaviour of Gross Domestic Product is explained by the independent variables. This was further proved with the adjusted value of 0.965744 which implies that 97% explanation of the behaviour of gross domestic product by the totality of the explanatory variables.

Validation and testing of hypotheses: Hypothesis 2 was tested under model 5 which examine the effect of capital flight on economic growth during the Pre-SAP period.

The hypothesis is re-stated in the null form as follows;

H_{02} : Capital flight has no significant effect on the Nigeria's economic growth.

The probability values from table 4.10 show that the alternative hypothesis is accepted for all the variables with the exception of current account balance (CAB) and net foreign asset of domestic banks (δ NEXTAS) because they are all significant in explaining the behaviour of the dependent variable as shown in the probability values. Thus, the alternative hypothesis is accepted for Change in External Debt (δ EXTDEBT), direct foreign investment (DFI) and change in reserve (δ RES) while the null hypothesis is accepted for the current account balance (CAB) net foreign asset of domestic banks (δ NEXTAS).

Table 4.11 Presentation and Interpretation of Post-SAP Short run Results for Model 6A (World Bank & Erbe 1985 approach)

DEPENDENT VARIABLE = GDP

INDEPENDENT VARIABLE	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	3.649664	0.726748	0.0001	Significant
δ EXTDEBT	0.055595	0.052201	0.2996	Insignificant
DFI	0.478791	0.071877	0.0000	Significant
CAB	0.317518	0.076944	0.0005	Significant
δ RES	0.095994	0.080604	0.2476	Insignificant
R-squared	0.959437	Mean dependent var		14.90560
Adjusted R-squared	0.951324	S.D. dependent var		1.825435
S.E. of regression	0.402739	Akaike info criterion		1.195801
Sum squared resid	3.243975	Schwarz criterion		1.439576
Log likelihood	-9.947507	F-statistic		118.2641
Durbin-Watson stat	1.330589	Prob(F-statistic)		0.000000

Source: Computation, using E-view statistical package

The short-run relationship between gross domestic product and the explanatory variable can be expressed mathematically belowb as:

$$GDP_{POSTSAP} = 3.649664 + 0.055595\delta_{EXTDEBT} + 0.478791DFI + 0.317518CAB + 0.095994\delta_{RES} \dots\dots\dots (4.11)$$

The above results show that all the variables including the constant parameter are positively related to the dependent variable (Gross Domestic Product). The constant parameter, direct foreign investment (DFI) and current account balance (CAB) are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run in conformity with the expected results.

The result shows that a unit change in the constant parameter will lead to an increase of 3.649664 *in* Gross domestic products. The result also reveals that an increase in change in external debt will increase the level of capital flight 0.055595 while an increase in DFI will increase the GDP by 0.478791. A unit increase in current account balance (CAB) will lead to an increase of 0.317518 in GDP while a unit change in external reserves will lead to increase level of Gross Domestic Product by 0.095994.

The Adjusted R^2 of 0.959437 reveals that about 96% of the behaviour of Gross Domestic Product is explained by the independent variables. This was further proved with the adjusted value of 0.951324 which implies that 96% explanation of the behaviour of gross domestic product by the totality of the explanatory variables.

Validation and testing of hypotheses: Hypothesis 2 was tested under model 5 which examine the effect of capital flight on economic growth during the Post-SAP period.

The hypothesis is re-stated in the null form as follows;

H₀₂: Capital flight has no significant effect on the Nigeria's economic growth.

The probability values from table 4.11 shows that the alternative hypothesis is accepted for direct foreign investment (DFI) and current account balance (CAB) while the null hypothesis is accepted for Change in External Debt ($\delta\text{EXTDEBT}$) and change in reserve (δRES) because their probability values are greater than 5%.

Table 4.12 Presentation and Interpretation of Post-SAP Short run Results for Model 6B (Morgan Guaranty Trust (1986) approach)

DEPENDENT VARIABLE = GDP

INDEPENDENT VARIABLE	COEFFICIENT OF ESTIMATES	T- STATISTICS	PROBABILITY VALUE	REMARKS
C	3.896223	5.117079	0.0001	Significant
$\delta\text{EXTDEBT}$	0.026396	0.447786	0.6594	Insignificant
DFI	0.456492	6.109136	0.0000	Significant
CAB	0.290508	3.591736	0.0019	Significant
δRES	0.061527	0.709184	0.4868	Insignificant
δNEXTAS	0.094702	1.055371	0.3045	Insignificant

R-squared	0.961683	Mean dependent var	14.90560
Adjusted R-squared	0.951599	S.D. dependent var	1.825435
S.E. of regression	0.401598	Akaike info criterion	1.218833
Sum squared resid	3.064339	Schwarz criterion	1.511363
Log likelihood	-9.235413	F-statistic	95.37242
Durbin-Watson stat	1.313706	Prob(F-statistic)	0.000000

Source: Computation, using E-view statistical package

The short-run relationship between gross domestic product and the explanatory variable can be expressed mathematically below as:

$$GDP_{PRESAP} = 3.896223 + 0.026396\delta EXTDEBT + 0.456492DFI + 0.290508CAB + 0.061527\delta RES + 0.094702\delta NEXTAS \dots\dots\dots (4.12)$$

Just like the case of the World Bank & Erbe (1985) approach, Morgan Guaranty Trust approach gave similar results. The analysis shows that all the variables including the constant parameter are positively related to the dependent variable (Gross Domestic Product). The constant parameter, direct foreign investment (DFI) and current account balance (CAB) are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run in conformity with the expected results. The result shows that a unit change in the constant parameter will lead to an increase of 3.896223 *in* Gross domestic products. The result also reveals that an increase in change in external debt will increase the level of capital flight by 0.026396 while an increase in DFI will increase the GDP by 0.456492. A unit increase in current account balance (CAB) will lead to an increase of 0.290508 in GDP while a unit change in external reserves will lead to increase level of Gross Domestic Product by 0.061527 and a unit change in net foreign asset of domestic banking (δ NEXTAS) will lead to an increase of 0.094702.

The Adjusted R² of 0.961683 reveals that about 96% of the behaviour of Gross Domestic Product is explained by the independent variables. This was further proved with the adjusted value of 0.951599 which implies that 96% explanation of the behaviour of gross domestic product by the totality of the explanatory variables.

Validation and testing of hypotheses: Hypothesis 2 was tested under model 5 which examine the effect of capital flight on economic growth during the Post-SAP period.

The hypothesis is re-stated in the null form as follows;

H₀₂: Capital flight has no significant effect on the Nigeria's economic growth.

The probability values from table 4.12 shows that the alternative hypothesis is accepted for direct foreign investment (DFI) and current account balance (CAB) while the null hypothesis is accepted for Change in External Debt ($\delta EXTDEBT$), change in reserve (δRES) and net foreign asset of domestic banking ($\delta NEXTAS$) because their probability values are greater than 5%.

4.3.2 The Long Run Test

Having considered the short term relationship that exists among the variables in model 1 to 6 through the use of ordinary least method of regression analysis (OLS), the long term relationship will now be considered with the use of Johansen Co-Integration technique. The reason for this is because of some perceived weaknesses of the OLS technique. Some of these weaknesses include the inability of OLS method to determine long run relationship among variables and the spuriousity often associated with the coefficient of determination (R^2) of OLS method. In testing the long run relationship, various stages are involved, some of these include: the unit root test, the co-integration test and error correction mechanism (ECM1 and ECM2). The Co-Integration technique and Error Correction Mechanism are also employed because the unit root tests carried out showed that the variables are not stationary at the same level

4.4 Stationary Test

Performing a unit root test for time series model is considered mandatory to establish the stationarity of the variables in such model. The decision rule is: if the Augmented Dickey Fuller (ADF) statistics is greater than 5% Mackinnon critical value (in absolute terms), the variable is stationary, we accept the alternate hypothesis (H_1) and reject the null hypothesis (H_0). The following tables give the stationarity of the dependents and the independent variables in the six formulated models:

Table 4.13. UNIT ROOT RESULT AT LEVEL FOR MODELS 1 3 AND 4

VARIABLES	ADF STATISTICS VALUE	MACKINNO CRITICAL VALUE @ 5%	H ₀	H ₁	REMARKS
KFW	-0.495567	-2.9358	Accept	Reject	NON-STATIONARY
KFM	-0.681736	-2.9358	Accept	Reject	NON-STATIONARY
δ EXTDEBT	-2.201592	-2.9358	Accept	Reject	NON-STATIONARY
DOP	-1.860631	-2.9358	Accept	Reject	NON-STATIONARY
INF	-4.342622	-2.9358	Reject	Accept	STATIONARY
GCF	-1.946810	-2.9358	Accept	Reject	NON-STATIONARY
DR	-0.130389	-2.9358	Accept	Reject	NON-STATIONARY
PRIVCR	0.040245	-2.9358	Accept	Reject	NON-STATIONARY
USIRD	-2.056420	-2.9358	Accept	Reject	NON-STATIONARY
GOCE	-0.132702	-2.9358	Accept	Reject	NON-STATIONARY

Source: Results of analysis from E-view statistical package

The table above shows that all variables except inflation (INF) are non-stationary before differencing and therefore, we reject the null hypothesis) (H₀) for all the variables and accept the alternate hypothesis (H₁) In order to ensure the stationarity of data for the variables which are found to be non-stationary at level, we proceed to test for stationarity at first difference. The result of the first differencing as duly presented in the appendix C is summarized below.

Table 4.13.1 UNIT ROOT TEST AT FIRST DIFFERENCE FOR MODELS 1, 3 AND 4

VARIABLES	ADF STATISTICS VALUE	MACKINNO CRITICAL VALUE @ 5%	H ₀	H ₁	REMARKS
KFW	-7.876181	-2.9378	Reject	Accept	STATIONARY
KFM	-7.244402	-2.9378	Reject	Accept	STATIONARY
δ EXTDEBT	-8.348753	-2.9378	Reject	Accept	STATIONARY
DOP	-5.323674	-2.9378	Reject	Accept	STATIONARY

GCF	-8.681226	-2.9378	Reject	Accept	STATIONARY
DR	-3.190340	-2.9378	Reject	Accept	STATIONARY
PRIVCR	-4.499841	-2.9378	Reject	Accept	STATIONARY
USIRD	-6.618476	-2.9378	Reject	Accept	STATIONARY
GOCE	-4.950671	-2.9378	Reject	Accept	STATIONARY

Source: Results of analysis from E-view statistical package

Table 4.13.1 above shows that dependent variable and other seven variables are stationary at first difference. This is proven by the ADF statistics of each variable (KFW, δ EXTDEBT, DOP, GCF, DR, PRIVCR, USIRD and GOCE) that shows a value greater than the 5% Mackinnon critical values respectively. Hence, we reject their respective null hypothesis (H_0) and accept their alternate hypothesis (H_1).

Table 4.13.2 UNIT ROOT RESULT AT LEVEL FOR MODELS 2, 5 AND 6

VARIABLES	ADF STATISTICS VALUE	MACKINNO CRITICAL VALUE @ 5%	H_0	H_1	REMARKS
GDP	-1.984437	-2.9969	Accept	Reject	NON-STATIONARY
δ EXTDEBT	-3.716193	-2.9969	Reject	Accept	STATIONARY
DFI	0.497843	-2.9969	Accept	Reject	NON-STATIONARY
CAB	-2.733113	-2.9969	Accept	Reject	NON-STATIONARY
δ RES	-2.509373	-2.9969	Accept	Reject	NON-STATIONARY
δ NEXTAS	-1.842900	-2.9969	Accept	Reject	NON-STATIONARY

Source: Results of analysis from E-view statistical package

The table above shows that all variables except change in external debt (δ EXTDEBT) are non-stationary before differencing and therefore, we reject the null hypothesis (H_1) for all the variables except δ EXTDEBT and accept the alternate hypothesis (H_0). In order to ensure the stationarity of data for the variables which are found to be non-stationary at level, we proceed to test for stationarity at first difference.

Table 4.13. 3 UNIT ROOT TEST AT FIRST DIFFERENCE FOR MODELS 2, 5 AND 6

VARIABLES	ADF STATISTICS VALUE	MACKINNO CRITICAL VALUE @ 5%	H ₀	H ₁	REMARKS
GDP	-3.361317	-3.0038	Reject	Accept	STATIONARY
DFI	-4.009544	-3.0114	Reject	Accept	STATIONARY
CAB	-4.025890	-3.0038	Reject	Accept	STATIONARY
δRES	-4.189475	-3.0038	Reject	Accept	STATIONARY
δNEXTAS	-6.746095	-3.0038	Reject	Accept	STATIONARY

Source: Results of analysis from E-view statistical package

Table 4.13.3 above shows that dependent variable and other variables are stationary at first difference. This is proven by the ADF statistics of each variable (GDP, DFI, CAB, δRES and δNEXTAS) that shows a value greater than the 5% Mackinnon critical values respectively. Hence, we reject their respective null hypothesis (H₀) and accept their alternate hypothesis (H₁).

The table below shows the summary of the stationary test carried out on the variables:

TABLE 4.13.4 Summary of Stationarity test

VARIABLE	ORDER OF STATIONARITY (ADF)
KFW	1(1)
KFM	1(1)
DOP	1(1)
INF	1(1)
δEXDEBT	1(1)
DR	1(1)
DOP	1(1)
PRIVCR	1(1)
UDIRD	1(1)
GOCE	1(1)

GDP	1(1)
DFI	1(1)
CAB	1(1)
δ RES	1(1)
δ NEXTAS	1(1)

Source: Computation, using E-view statistical package

Table 4.13.4 above shows the levels of stationary for the variables. The ECM 1 to ECM 12 of the twelve equations is all stationary at level 1(0). Having established the stationarity of the variables, the next stage is to proceed to perform the Cointegration test. The cointegration test Is performed because the variables are stationary at different levels..

4.5 Cointegration Test

Given the above multivariable cases, the test for Cointegration is performed using the Johnsen Maximum Likelihood Estimate technique. Trace statistics test is also used to test whether a long-run relationship exists among the variables or not. If this test establishes that, at least, one Cointegration vector exists among the variables under investigation, a long run equilibrium relationship exists among the variables. Furthermore, before there can be a long-run relationship among the variables, the trace statistics (Likelihood ratio) must be greater than 5% critical value at None hypothesized (None**). The table below shows the result of Johansen Cointegration test conducted on the specified models with their respective Cointegration equations.

**Table 4.14 Result of Cointegration Test for Model 1A
(World Bank & Erbe 1985 approach)**

Series: KFW EXTDEBT DOP INF GCF DR PRIVCR INTDIFF GOCE

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.935807	320.0949	192.89	204.95	None **
0.797808	210.2607	156.00	168.36	At most 1 **
0.662013	146.3192	124.24	133.57	At most 2 **
0.578695	102.9292	94.15	103.18	At most 3 *
0.506735	68.35335	68.52	76.07	At most 4
0.378693	40.08503	47.21	54.46	At most 5
0.317649	21.04781	29.68	35.65	At most 6
0.131239	5.759381	15.41	20.04	At most 7
0.003292	0.131915	3.76	6.65	At most 8

*(**) denotes rejection of the hypothesis at 5 % (1%) significance level L.R. test indicates 4 cointegrating equation(s) at 5% significance level.

Source: Computation, using E-view statistical package.

Table 4.14 above shows that a long run equilibrium relationship exists in the World Bank & Erbe (1985) approach of Model as likelihood ratio of 320.0949 is greater than 5 per cent critical value of 192.89 at none hypothesized (None**). The analysis indicates that there are four cointegrating equations at 5% significance level. The results confirmed that various determinants of capital flight namely: external debt (EXTDEBT), degree of openness (DOP), inflation rate (INF), gross capital formation (GCF), deposit rate (DR), private sector credit (PRIVCR), interest rate differential (USIRD) and government current expenditure (GOCE) are co-integrated in the long run. Hence, the hypothesis of no co-integration (H_0) is rejected and that of presence of co-integration (H_1) is upheld.

4.5.1 The Long Run Model

The long run model is derived from the Johansen co-integration result from which the equation with the lowest log-likelihood ratio is chosen. The equation with the lowest log-likelihood ratio is the first equation with the corresponding value of -128.7814 and it is presented as follows:

$$\begin{aligned}
 KFW = & 2.260204 \delta_{EXTDEBT} - 0.165123_{DOP} + 0.926431_{INF} + 2.080895_{GCF} - 4.191684_{DR} - 0.436799_{PRIVCR} \\
 & (0.73588) \quad (0.81570) \quad (0.38151) \quad (0.59936) \quad (1.33736) \quad (0.41330) \\
 & - 2.335059_{USIRD} - 4.359956_{GOCE} \dots \dots \dots (4.13) \\
 & (0.75457) \quad (1.19669)
 \end{aligned}$$

Note: Standard error statistics are given in parentheses

The long run Cointegration equation moves slightly in deviation to its short run results. The degree of openness (DOP) that was positively related to capital flight is now positively related showing that an open economy is prone to high capital flight in the long run, the inflation rate that was positively signed is now positively related to capital flight. This negative sign is appropriately signed because high inflation induces capital flight while low or moderate inflation rate encourages domestic investment. Although, the degree of openness (DOP) is expected to be positively related to capital flight (KF), i.e., an open economy which is

measured by free flow of export and import is expected to propel greater out flow of capital. However, if the rate of export is greater than import in an economy, there will be more inflow of capital than out flow of capital. This is what this negative relationship in this analysis suggests. In like manner, gross capital formation (GCF) that was negatively related to capital flight in the short run is now positively related to capital flight (KF). This is not appropriately signed because high domestic investment is expected to boost economic growth and reduce capital flight. Generally, GCF which is a reflection of increase of investment in fixed capital and other tangible infrastructures that will discourage capital out flow. Again, the government current expenditure (GOCE) and private sector credit (PRIVCR) that exhibited positive relationship with the dependent variable (capital flight) now revealed negative relationship; this is in line with the *a priori* expectation because increase in government expenditures will improve domestic economy and reduce borrowed funds that are subject to volatility while increase in banks' credit to finance domestic investment will boost the economy and encourage private wealth holders to invest locally. However, change in external debt ($\delta EXDEBT$) maintains the same positive relationship with capital flight both in the short and long run. This proved that increased debt accumulation in Nigeria has brought about increase capital flight; this confirmed the debt volatility nature of the Nigerian debt. Also, inflation rate (INF) and deposit rate (DR) maintains the same negative relationship, these variables are appropriately signed because high deposit rate on will encourage domestic wealth holders to invest at home rather to moving their capital abroad for higher returns while a persistent increase in inflation rate will prompt local investors to move their capital to other economies with stable rate. If the cost of securing funds for investment in Nigeria is far higher than the rate in other economies, the rate of capital out flow will be high. especially the United State of America and other developed economies. Apart from this, high interest rate differential between Nigeria and the rest of the World will encourage capital flight while a low interest rate differential will reduce capital flight.

Having investigated the existence of long run relationship in the models, the next is to conduct the error correlation mechanism.

4.5.2 Error Correction Test for Model 1A (World Bank & Erbe (1985) approach).

In line with the result obtained in the unit root test, the error correction mechanism showed that the ECM is stationary at level; therefore, an over-parametized error correction model is required in this analysis and was obtained by using the lag length to ensure that the dynamics of the model is not compromised and properly captured. The result of the over-parametized error correction model (ECM1) is presented in table 4.14.1 below:

Table 4.14.1 Overparameterized ECM 1 (World Bank & Erbe (1985) approach).

This table shows the over parameterized and parsimonious ECM for model 1.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KFW(-1),2)	-0.401921	0.118523	-3.391070	0.0026
D(EXTDEBT,2)	0.272752	0.058101	4.694472	0.0001
D(EXTDEBT(-1),2)	0.079978	0.062270	1.284386	0.2124
D(DOP,2)	-0.346061	0.577219	-0.599531	0.5549
D(DOP(-1),2)	-0.987925	0.580502	-1.701846	0.1029
D(INF(-1),2)	0.051490	0.199526	0.258060	0.7988
D(GCF,2)	-0.049846	0.049644	-1.004051	0.3263
D(GCF(-1),2)	-0.056301	0.048570	-1.159168	0.2588
D(DR,2)	0.802085	0.678762	1.181687	0.2499
D(DR(-1),2)	0.729211	0.684285	1.065654	0.2981
D(PRIVCR,2)	-1.061348	0.932176	-1.138570	0.2671
D(PRIVCR(-1),2)	-2.233268	1.046025	-2.135005	0.0441
D(INTDIFF,2)	-0.037951	0.160513	-0.236437	0.8153
D(INTDIFF(-1),2)	0.135223	0.148195	0.912467	0.3714
D(GOCE,2)	0.426412	0.619047	0.688819	0.4981
D(GOCE(-1),2)	0.437816	0.559938	0.781900	0.4426
ECM(-1)	-1.135099	0.246117	-4.612031	0.0001
R-squared	0.915781	Mean dependent var	-0.001876	
Adjusted R-squared	0.854532	S.D. dependent var	1.827269	
S.E. of regression	0.696927	Akaike info criterion	2.415002	
Sum squared resid	10.68555	Schwarz criterion	3.140145	
Log likelihood	-30.09255	Durbin-Watson stat	1.645959	

Source: Computation, using E-view statistical package.

The summary of the over-parametized ECM above shows that the coefficient of the ECM is significant with the negative sign (-). This implies it effectiveness in the correction of any deviation that may occur in the long-run. It shows the speed of adjustment in the dependent if there is deviation in the independent variables. The coefficient is -1.135099 which implies a sharp adjustment rate of approximately -1.14 units to any changes that may occur on the long-run and rate of correction of past deviation in the present period.

These means that the present value of KFW adjust very sharply to changes in (δ EXTDEBT, DOP, INF, GCF, DR, PRIVCR, USIRD, GOCE)

In order to attain effectiveness of the model, there is the need to simplify the model to a more parsimonious model. The parsimonious model would be gotten by estimating the equation of only those variables that appear significant in the over-parametized ECM. The table below shows the result of the parsimonious model estimated. The coefficient of multiple determinations denoted as R^2 shows that about 92% in KF can be explained by the independent variables while the remaining 8% is explained by stochastic variables and the Durbin-Watson statistic of 1.645959 falls within the inconclusive region.

Table 4. 14. 2. Parsimonious ECM 2 for Model 1A (World Bank & Erbe (1985) Approach).

These tables show the over parameterized and parsimonious ECM for model 1.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT,2)	0.208801	0.047477	4.397968	0.0001
D(DOP(-1),2)	-0.601640	0.407675	-1.475782	0.1504
D(INF,2)	-0.194608	0.139838	-1.391667	0.1743
D(GCF(-1),2)	-0.077298	0.049736	-1.554171	0.1306
D(DR,2)	0.441408	0.493481	0.894479	0.3782
D(PRIVCR(-1),2)	-1.057323	0.877283	-1.205225	0.2375
D(INTDIFF(-1),2)	-0.072382	0.134363	-0.538704	0.5941
D(GOCE(-1),2)	-0.565986	0.488688	-1.158177	0.2559
ECM(-1)	-1.422630	0.247771	-5.741712	0.0000

R-squared	0.851474	Mean dependent var	-0.001876
Adjusted R-squared	0.811867	S.D. dependent var	1.827269
S.E. of regression	0.792565	Akaike info criterion	2.572089
Sum squared resid	18.84476	Schwarz criterion	2.955988
Log likelihood	-41.15573	Durbin-Watson stat	1.772730

Source: Computation, using E-view statistical package.

From the result above, the coefficient of the ECM is further proven significant with it conformity to the over-parametized ECM. The value of the ECM shows a negative of -1.422630. This coefficient in it negative form implies that the speed of adjustment of any past deviation to long-run equilibrium in present period. It therefore indicates that the value of the KFW adjust more sharply to changes in the explanatory variables as it was in the over-parametized model.

The table above shows the overparameterised ECM (ECM1) and parsimonious ECM (ECM2) for model 1. The negative sign in the ECM value in both model (ECM 1 and 2) shows that the ECM is significant. This implies that the present value of KF adjust rapidly to change in DOP, INF, GCF, δ EXDEBT, DR, PRIVCR,

USIRD and GOCE. The ECM value of -1.924937 in ECM 1 shows a feedback of the value from the previous period disequilibrium of the present level of KF in the determination of causality between the past level of capital flight (KF) and the present and past level of DOP, INF, GCF, δ EXDEBT, DR, PRIVCR, USIRD and GOCE. The coefficient of multiple determinations denoted as R^2 shows that about 85% in KF can be explained by the independent variables while the remaining 15% is explained by stochastic variables. Durbin-Watson statistic of 1.772730 falls within the inconclusive region.

4. 5.3 Tests for the Statistical Significance of Parameters

The statistical significance of each variable was tested with the use of standard error test. This is done by comparing the standard error statistics with half of the coefficient of each variable as given in the Johansen co-integration result in absolute terms. The table below displays the standard error test for the World Bank & Erbe approach of model 1.

Table4.14.3. Standard Error Test for Model 1A (World Bank & Erbe (1985) Approach)

VARIABLES	COEFFICIENT	COEFFICIENT/2	STANDARD ERROR	DECISION
δ EXTDEBT	2.260204	1.130102	0.73588	Significant
DOP	0.165123	0,082562	0.81570	Insignificant
INF	0.926431	0.463216	0.38151	Significant
GCF	2.080895	1.040448	0.59936	Significant
DR	4.191684	2.095842	1.33736	Significant
PRIVCR	0.436799	0.218399	0.41330	Insignificant
USIRD	2.335059	1.167529	0.75457	Significant
GOCE	4.359956	2.179978	1.19669	Significant

Source: Computation, using E-view statistical package.

Validation and testing of hypotheses:

Table 4.14.3 above indicates that six of the eight explanatory variables are significant in determining the level of capital flight in Nigeria under the Word Bank and Erbe approach to estimating capital flight. These variables are: $\delta\text{EXTDEBT}$, INF, DR, GCF, USIRD and GOCE. This implies these six variables are statistically significant in the explanation the behaviour of capital flight in Nigeria for the period under study.

Based on the above, the under listed hypotheses were tested under model 1.

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Macroeconomic, Political and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

Hypothesis 1: the alternative hypothesis is accepted because the significant variables can be grouped into political, economic and institutional factors as follows: Political: debt volatility ($\delta\text{EXTDEBT}$) and government current expenditure (GOCE), economic: inflation rate (INF, gross capital formation (GCF), and interest rate differential (USIRD), institutional: deposit rate (DR).

Hypothesis 3: since $\delta\text{EXTDEBT}$, INF, DR, GCF, USIRD and GOCE have been identified as the determinants of capital flight in Nigera, it thus followed that the factors that influence the choice of private wealth holders in Nigeria are political, economic and institutional uncertainties. Hence the alternative hypothesis is accepted for $\delta\text{EXTDEBT}$, INF, DR, GCF, USIRD and GOCE that are significant while the null hypothesis is accepted for PRIVCR and DOP that are not significant.

Hypothesis 4: since the major determinants have been identified, it is possible to reverse capital flight trend in Nigeria through the implementation of policies and recommendations proffered in this study. Hence the null hypothesis is rejected and alternative accepted for hypothesis 4.

4.5.4 Tests for Overall Significance of Model 1A. (World Bank & Erbe (1985))

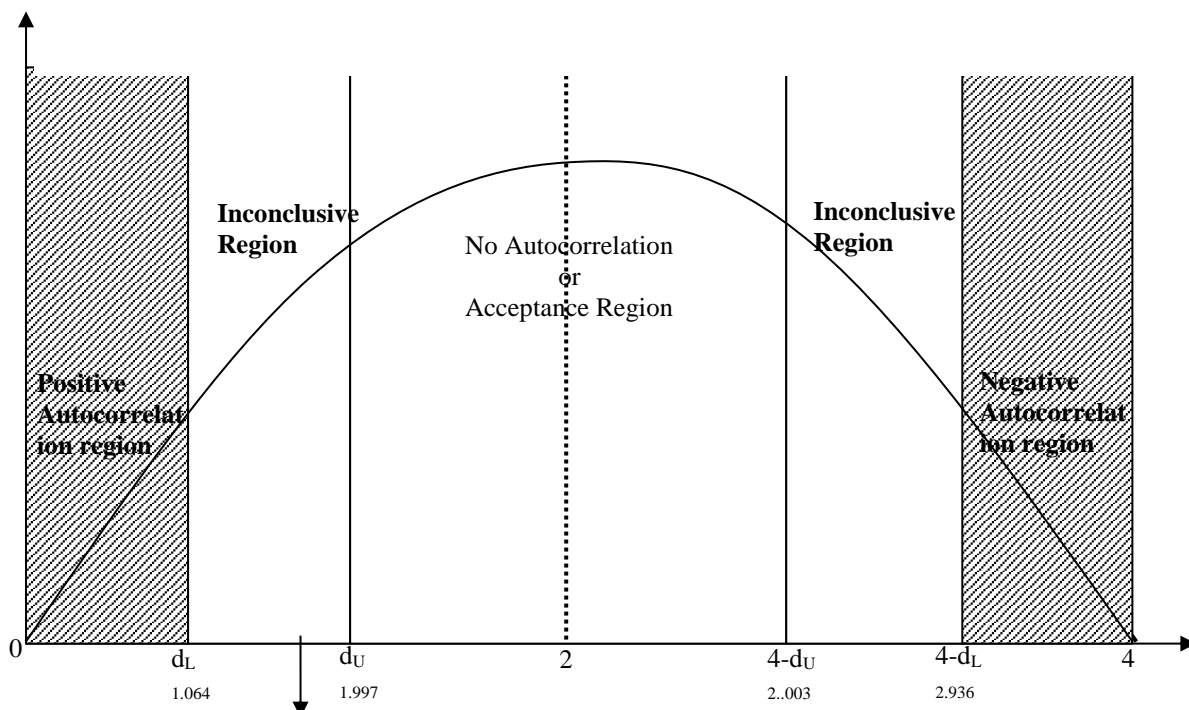
The F-test is used to test the statistical significance of the entire model. This is done to determine the overall significance of behaviour of all explanatory variables adopted in the model. It is done by comparing the F-statistics in the OLS result and the table value (F-test). The hypothesis is formulated as depicted below: H_0 : The overall model is not significant H_1 : The overall model is significant. The decision rule is to accept the alternative hypothesis if the F-calculated is greater than F-tabulated and vice versa. For this model, The F-statistic caculatedvalue is 89.18940 while the F-tabulated value 2.27, hence the accept H_0 : ie the model is statistically significant.

4.5.5 Tests for Overall Significance of Model 1B.

The presence of autocorrelation is tested using the Durbin Watson test and it value is gotton from E-view analysis. The DW statistics gotten from the parsimonious model was used in other to obtain the most reliable result after all adjustment has been made.

For model 1 (World Bank & Erbe (1985)), the value of DW statistics is 1.772730 while the degree of freedom is 8 (9-1) and the number of year is 42 years

Figure 4.6



$$DW^* = 1.772730$$

Graph 4.6 Durbin Watson graph for Model 1A.

From the above graph, the DW statistics value of 1.772730 falls within the inconclusive region. Since this value tends toward 2, there is no evidence of autocorrelation.

Table 4.15 Result of Cointegration Test for Model 1B

Series: KFM EXTDEBT DOP INF GCF DR PRIVCR INTDIFF GOCE

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.932707	299.3141	192.89	204.95	None **
0.825263	199.4624	156.00	168.36	At most 1 **
0.680666	134.9168	124.24	133.57	At most 2 **
0.565902	92.68063	94.15	103.18	At most 3
0.524678	61.80468	68.52	76.07	At most 4
0.402360	34.28549	47.21	54.46	At most 5
0.283212	15.23910	29.68	35.65	At most 6
0.071884	2.919011	15.41	20.04	At most 7
0.004285	0.158882	3.76	6.65	At most 8

*(**) denotes rejection of the hypothesis at 5 % (1%) significance level L.R. test indicates 3 cointegrating equation(s) at 5% significance level.

Source: Computation, using E-view statistical package.

Table 4.15 above shows that a long run equilibrium relationship exists in the Morgan Guaranty Trust (1986) approach of Model as likelihood ratio of 299.3141 is greater than 5 per cent critical value of 192.89 at none hypothesized (None**). The analysis indicates that there are three cointegrating equations at 5% significance level. The results confirmed that various determinants of capital flight namely: external debt (EXTDEBT), degree of openness (DOP), inflation rate (INF), gross capital formation (GCF), deposit rate (DR), private sector credit (PRIVCR), interest rate differential (USIRD) and government current expenditure (GOCE) are co-integrated in the long run. Hence, the hypothesis of no co-integration (H_0) is rejected and that of presence of co-integration (H_1) is upheld.

4.6. The Long Run Model

The long run model is derived from the Johansen co-integration result from which the equation with the lowest log-likelihood ratio is chosen. The equation with the lowest log-likelihood ratio is the first equation with the corresponding value of -132.5319 and it is presented as follows:

$$KFM = 6.393578 \delta_{EXTDEBT} + 3.054460 DOP - 0.369674 INF + 6.127230 GCF - 9.30069 DR - 1.080118 PRIVCR - 7.390905 USIRD - 10.74542 GOCE \dots\dots\dots (4.14)$$

(3.23847)
(2.84440)
(0.92346)
(3.07466)
(4.57815)
(1.44636)
(3.85363)
(1.44636)

Note: Standard error statistics are given in parentheses

A critical appraisal of the above result shows that it is similar to the short run result, specifically, change in external debt are positively signed in both results while , inflation and deposit rates are negatively related to capital flight in both short and long run. However, the degree of openness (DOP) that was positively related to capital flight in the short run is now positively related. This shows that an open economy is prone to high capital flight in the long run. In like manner, gross capital formation (GCF) that was positively related to capital flight in the short run is now negatively related while the credit to private sector (PRIVCR) that was positively signed in the short run is now negatively related to capital flight (KF), both the gross capital formation (GCF) and private sector credit (PRIVCR) are now appropriately signed. The government current expenditure with negative sign in the long run is now in line with the expected result. Generally, INF, DR, DOP, PRIVCR, USIRD and GOCE are appropriately signed in line with the apriori expectation.

However, change in external debt ($\delta EXDEBT$) maintains the same positive relationship with capital flight both in the short and long run. This proved that increased debt accumulation in Nigeria has brought about increase capital flight; this confirmed the debt volatility nature of the Nigerian debt. Also, inflation rate (INF) and deposit rate (DR) maintains the same negative relationship, these variables are appropriately signed because high deposit rate on will encourage domestic wealth holders to invest at home rather to moving their capital abroad for higher returns while a persistent increase in inflation rate will prompt local investors to move their capital to other economies with stable rate. Having investigated the existence of long run relationship in the models, the next is to conduct the error correlation mechanism.

4.6.1. Error Correction Test for Model 1B (Morgan Guaranty Trust (1986) Approach)

In line with the result obtained in the unit root test, the result of the over-parametized error correction model (ECM1) is presented in table 4.15.1 below:

Table 4.15.1 Overparameterized ECM 1 for Model 1B

This table shows the over parameterized ECM for model 1B.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KFM(-1),2)	-0.296670	0.124142	-2.389769	0.0287
D(EXTDEBT,2)	0.407838	0.112662	3.620029	0.0021
D(EXTDEBT(-1),2)	0.142340	0.103164	1.379748	0.1855
D(DOP,2)	-2.525752	0.989287	-2.553103	0.0206
D(DOP(-1),2)	-2.306569	0.960885	-2.400463	0.0281
D(INF,2)	0.372836	0.262252	1.421671	0.1732
D(INF(-1),2)	-0.351650	0.309168	-1.137408	0.2711
D(GCF,2)	-0.102316	0.074613	-1.371298	0.1881
D(GCF(-1),2)	0.117949	0.088729	1.329319	0.2013
D(DR,2)	0.364575	0.970312	0.375730	0.7118
D(DR(-1),2)	1.774326	1.151708	1.540603	0.1418
D(PRIVCR,2)	-1.942842	1.929214	-1.007064	0.3280
D(PRIVCR(-1),2)	-3.671129	1.835121	-2.000483	0.0617
D(INTDIFF,2)	0.626482	0.303848	2.061826	0.0549
D(INTDIFF(-1),2)	0.201748	0.286358	0.704529	0.4906
D(GOCE,2)	1.059232	1.181667	0.896388	0.3826
D(GOCE(-1),2)	-0.274093	0.879277	-0.311726	0.7590
ECM(-1)	-1.064011	0.201494	-5.280620	0.0001
R-squared	0.928954	Mean dependent var		0.061694
Adjusted R-squared	0.857907	S.D. dependent var		2.645017
S.E. of regression	0.997044	Akaike info criterion		3.138394
Sum squared resid	16.89966	Schwarz criterion		3.938287
Log likelihood	-36.92189	Durbin-Watson stat		1.257679

Source: Computation, using E-view statistical package.

The summary of the over-parametized ECM above shows that the coefficient of the ECM is significant with the negative sign (-). This implies it effectiveness in the correction of any deviation that may occur in the long-run. It shows the speed of adjustment in the dependent if there is deviation in the independent variables. The coefficient is -1.064011 which implies a sharp adjustment rate of approximately -1.1 units to any changes that may occur on the long-run and rate of correction of past deviation in the present period. These means that the present value of KFW adjust very sharply to changes in (δ EXTDEBT, DOP, INF, GCF, DR, PRIVCR, USIRD, GOCE)

In order to attain effectiveness of the model, there is the need to simplify the model to a more parsimonious model. The parsimonious model is gotten by estimating the equation of only those variables that appear significant in the over-parametized ECM. The coefficient of multiple determinations denoted as R^2 shows that about 93% in KF can be explained by the independent variables while the remaining 7% is explained by

stochastic variables and the Durbin-Watson statistic of 1.257679 falls within the inconclusive region. Table 4.15.2 below shows the result of the parsimonious model estimated.

Table 4.15.2 Parsimonious ECM 2 for (Morgan Guaranty Trust (1986) Approach)

This table shows the over parameterized and parsimonious ECM for model 1.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT,2)	0.262969	0.086956	3.024167	0.0054
D(DOP,2)	0.034053	0.730133	0.046640	0.9631
D(INF,2)	0.100925	0.208266	0.484599	0.6319
D(GCF,2)	-0.048238	0.068629	-0.702876	0.4881
D(DR(-1),2)	0.592191	0.793468	0.746333	0.4619
D(PRIVCR(-1),2)	-1.998049	1.597741	-1.250547	0.2218
D(INTDIFF,2)	0.403307	0.278648	1.447371	0.1593
D(GOCE,2)	0.920045	0.781819	1.176800	0.2495
ECM(-1)	-1.522111	0.226557	-6.718456	0.0000
R-squared	0.805508	Mean dependent var	0.044053	
Adjusted R-squared	0.747880	S.D. dependent var	2.609105	
S.E. of regression	1.310072	Akaike info criterion	3.590359	
Sum squared resid	46.33977	Schwarz criterion	3.986238	
Log likelihood	-55.62646	Durbin-Watson stat	1.868760	

Source: Computation, using E-view statistical package.

From the result above, the coefficient of the ECM is further proven significant with its conformity to the over-parametrized ECM. The value of the ECM shows a negative of -1.522111. This coefficient in its negative form implies that the speed of adjustment of any past deviation to long-run equilibrium in the present period. This implies that the present value of KF adjusts rapidly to changes in DOP, INF, GCF, δ EXDEBT, DR, PRIVCR, USIRD and GOCE. The ECM value of -1.522111 in ECM 2 shows a feedback of the value from the previous period disequilibrium of the present level of KF in the determination of causality between the past level of capital flight (KF) and the present and past level of DOP, INF, GCF, δ EXDEBT, DR, PRIVCR, USIRD and GOCE. The coefficient of multiple determinations denoted as R^2 shows that about 81% in KF can be explained by the independent variables while the remaining 19% is explained by stochastic variables. Durbin-Watson statistic of 1.868760 falls within the inconclusive region.

4. 6.3 Tests for the Statistical Significance of Parameters

The statistical significance of each variable was tested with the use of standard error test. This is done by comparing the standard error statistics with half of the coefficient of each variable as given in the

Johansen co-integration result in absolute terms. The table below displays the standard error test for the World Bank & Erbe approach of model 1.

Table 4.15. 3. Standard Error Test for Model 1B (Morgan Guaranty Trust (1986) Approach)

VARIABLES	COEFFICIENT	COEFFICIENT/2	STANDARD ERROR	DECISION
ΔEXTDEBT	2.260204	1.619235	0.73588	Significant
DOP	0.165123	1.4222	0.81570	Significant
INF	0.926431	0.46173	0.38151	Significant
GCF	2.080895	1.53733	0.59936	Significant
DR	4.191684	2.289075	1.33736	Significant
PRIVCR	0.436799	0.72318	0.41330	Significant
USIRD	2.335059	1.926815	0.75457	Significant
GOCE	4.359956	0.72318	1.19669	Insignificant

Source: Computation, using E-view statistical package.

Validation and testing of hypotheses:

Table 4.15.3 above indicates that seven of the eight explanatory variables are significant in determining the level of capital flight in Nigeria under Morgan Guaranty Trust (1986) approach to estimating capital flight.

These variables are: ΔEXTDEBT, INF, DOP, DR, GCF, USIRD and PRIVCR. This implies these seven variables are statistically significant in the explanation the behaviour of capital flight in Nigeria for the period under study. This result confirmed the World Bank and Erbe (1986) approach where six of the seven variables were found to be responsible for the behaviour of capital flight.

Based on the above, the under listed hypotheses were tested under model 1 (Morgan Guaranty Trust (1986) approach).

H₀₁: Macroeconomic, Political and Institutional factors do not cause capital flight in Nigeria.

H₀₃: Macroeconomic, Political and Institutional factors do not influence the choice of private wealth holders in Nigeria.

H₀₄ Capital flight cannot be stemmed nor reversed in Nigeria.

Hypothesis 1: the alternative hypothesis is accepted because the significant variables can be grouped into political, economic and institutional factors as follows: Political: debt volatility ($\delta_{EXTDEBT}$) and government current expenditure (GOCE), economic: inflation rate (INF, gross capital formation (GCF), degree of openness (DOP) and interest rate differential (USIRD), institutional: deposit rate (DR) and private sector credit (PRIVCR).

Hypothesis 3: since $\delta_{EXTDEBT}$, INF, DOP, DR, GCF, USIRD and PRIVCR have been identified as the determinants of capital flight in Nigera, it thus followed that the factors that influence the choice of private wealth holders in Nigeria are political, economic and institutional uncertainties. Hence the alternative hypothesis is accepted for $\delta_{EXTDEBT}$, INF, DOP, DR, GCF, USIRD and PRIVCR that are significant while the null hypothesis is accepted for GOCE that is not statistically significant.

Hypothesis 4: since the major determinants have been identified, it is possible to reverse capital flight trend in Nigeria through the implementation of policies and recommendations proffered in this study. Hence the null hypothesis is rejected and alternative accepted for hypothesis 4.

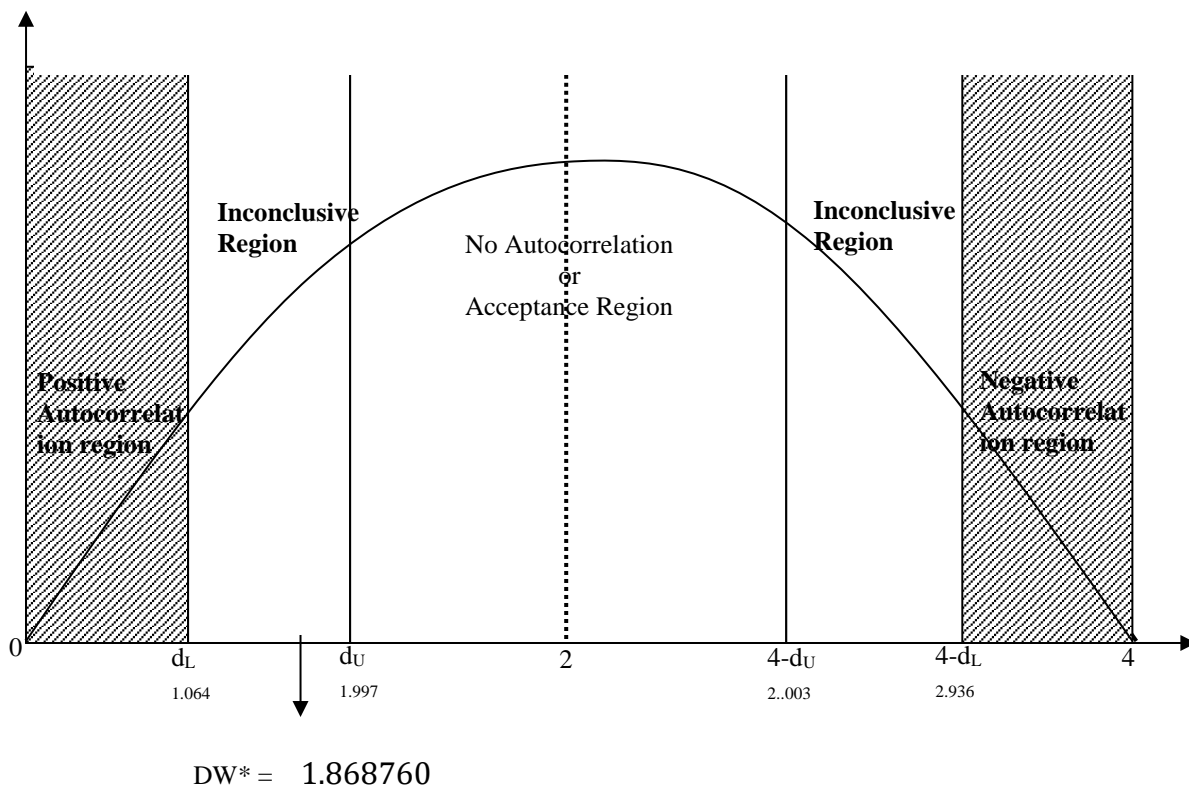
4.6.4 Tests for Overall Significance of Model1A (Morgan Guaranty Trust (1986) Approach)

The F-test is used to test the statistical significance of the entire model. This is done to determine the overall significance of behaviour of all explanatory variables adopted in the model. It is done by comparing the F-statistics in the OLS result and the table value (F-test). The hypothesis is formulated as depicted below: H₀: The overall model is not significant H₁: The overall model is significant. The decision rule is to accept the alternative hypothesis if the F-calculated is greater than F-tabulated and vice versa. For this model, The F-statistic caculatedvalue is 29.74016 while the F-tabulated value 2.27, hence the accept H₀: ie the model is statistically significant.

4.6.5 Tests for Presence of Autocorrelation in the Model 1B

The presence of autocorrelation is tested using the Durbin Watson test and its value is gotten from E-view analysis. The DW statistics gotten from the parsimonious model was used in other to obtain the most reliable result after all adjustment has been made. For model 1 (Morgan Guaranty Trust (1986), the value of DW statistics is 1.868760 while the degree of freedom is 8 (9-1) and the number of year is 42 years

Figure 4.7



Graph 4.7. Durbin Watson graph for Model 1B (Morgan Guaranty Trust (1986) approach. From the above graph, the DW statistics value of 1.868760 falls within the inconclusive region. Since this value tends toward 2, there is no evidence of autocorrelation.

Table 4.16 Result of Cointegration Test for Model 2A (World Bank & Erbe 1985 approach)

Series: GDP EXDEBT DFI CAB RES

Lags interval (in first differences): 1 to 1

EIGEN VALUE	LIKELIHOOD RATIO	5% CRITICAL VALUE	1% CRITICAL VALUE	HYPOTHESISED NO OF (CEs)
0.474747	70.40447	68.52	76.07	None *
0.441328	44.64948	47.21	54.46	At most 1
0.283674	21.36175	29.68	35.65	At most 2
0.170620	8.016926	15.41	20.04	At most 3
0.013257	0.533835	3.76	6.65	At most 4

*(**) denotes rejection of hypothesis @ 5 % (1%) Significant level L.R. test indicates test indicates 1 cointegrating equation(s) at 5% significance level.

Source: Computation, using E-view statistical package.

The table above shows that long-run relationship (co-integration) exist among Gross domestic product and it identified determinants; external debt (EXTDEBT), direct foreign investment (DFI), current account balance (CAB), and reserve (RES). This is reflected in the likelihood value of 70.40447 which is greater than 68.52 critical value at 5%. Thus, the hypothesis of no co-integration (H_0) is rejected and that of presence of co-integration (H_1) is upheld. The analysis indicates that there is one cointegrating equations at 5% significance level.

4.7.1 The Long Run Model

The long run model is derived from the Johansen co-integration result from which the equation with the lowest log-likelihood ratio is chosen. The equation with the lowest log-likelihood ratio is the first equation with the corresponding value of -210.7416 and it is presented as follows:

$$GDP = -1.406198 + 0.039389 \delta_{EXTDEBT} - 0.796985 \delta_{DFI} + 0.174985 \delta_{CAB} + 0.595361 \delta_{RES} \dots\dots\dots(4.15)$$

(0.03457) (0.10911) (0.10106) (0.12391)

Note: Standard error statistics are given in parentheses

The long run Cointegration equation moves slightly in deviation to its short run results. The constant and direct foreign investment (DFI) is negatively signed whereas all the variables were positively signed in the short run. The negative sign exhibited by DFI is not in conformity with the expected result of positive relationship with the GDP, this is because increase level of DFI IS expected to create employment in the domestic economy and boost economic growth.

4.7.2 Error Correction Test for Model 2A (World Bank & Erbe (1985) approach).

In line with the result obtained in the unit root test, the error correction mechanism showed that the ECM is stationary at level; therefore, an over-parametized error correction model is required in this analysis and was obtained by using the lag length to ensure that the dynamics of the model is not compromised and properly captured. The result of the over-parametized error correction model (ECM1) is presented in table 4.16.1 below:

Table 4.16.1 Over-Parametized Model (ECM 1) for Model 2A (World Bank & Erbe 1985 approach)

Dependent Variable = D (GDP, 2)

VARIABLES	COEFFICIENTS	STANDARD ERROR	T-STATISTICS	PROB VALUE
GDP(-1)	0.001263	0.002219	0.569088	0.5737
D(EXDEBT,2)	0.033810	0.009991	3.384023	0.0021
D(EXDEBT(-1),2)	0.006862	0.009622	0.713097	0.4815
D(DFI,2)	0.121590	0.068377	1.778235	0.0859
D(DFI(-1),2)	-0.049764	0.072732	-0.684206	0.4993
D(CAB,2)	0.039083	0.015798	2.473946	0.0195
D(CAB(-1),2)	-0.012220	0.014623	-0.835679	0.4102
D(RES,2)	0.053470	0.018522	2.886919	0.0073
D(RES(-1),2)	0.015641	0.018576	0.841989	0.4067
ECM(-1)	-0.356701	0.119944	-2.973910	0.0059

Source: Computation, using E-view statistical package.

The summary of the over-parametized ECM above shows that the coefficient of the ECM is significant with the negative sign (-). It implies it effectiveness in the correction of any deviation that may occur in the long-run. The coefficient is -0.356701 which implies a sharp adjustment rate of approximately -0.36 units to any

changes that may occur on the long-run and rate of correction of past deviation in the present period. These means that the present value of GDP adjust very sharply to changes in EXTDEBT, DFI, CAB and RES. In order to attain effectiveness of the model, there is the need to simplify the model to a more parsimonious model. The parsimonious model would be gotten by estimating the equation of only those variables that appear significant in the over-parametized ECM1. The table below shows the result of the parsimonious model estimated.

Table 4.16.2: Parsimonious Model (ECM2) (World Bank & Erbe 1985 approach)

Dependent Variable: D(EXDEBT(-1),2)
Method: Least Squares

VARIABLES	COEFFICIENTS	STANDARD ERROR	T-STATISTICS	PROB ABILITY VALUE
D(DFI(-1),2)	-0.479119	1.205027	-0.397600	0.6933
D(CAB(-1),2)	-0.234175	0.221241	-1.058460	0.2971
D(RES(-1),2)	0.438762	0.285467	1.536995	0.1333
ECM(-1)	0.307254	1.764498	0.174131	0.8628
R-squared	0.073753	Mean dependent var	-0.037285	
Adjusted R-squared	-0.005640	S.D. dependent var	3.792771	
S.E. of regression	3.803451	Akaike info criterion	5.606609	
Sum squared resid	506.3185	Schwarz criterion	5.777231	
Log likelihood	-105.3289	Durbin-Watson stat	3.054369	

Source: Computation, using E-view statistical package.

From the result above, the coefficient of the ECM2 is significant with it conformity to the over-parametized ECM. The value of the ECM2 shows a negative of -105.3289. This coefficient in it negative form implies that the speed of adjustment of any past deviation to long-run equilibrium in present period. It therefore indicates that the value of the GDP adjust more sharply to changes in the explanatory variables that it was in the over-parametized model.

Therefore, it can be deduced from the parsimonious model above that changes in the dependent variable (GDP) are determined by all the variables except DFI in the short-run while other variables and also, determines this changes in the long-run. The coefficient of multiple determinants (R^2) showed an approximate value of 0.073753 which implies that the variables that makes up the model can account for only approximately 7% of the behaviour of gross domestic product (GDP).

4.7.3 Tests for the Statistical Significance of Parameters

. The table below shows the results of the standard error test conducted with the level of significance of the explanatory variables in absolute terms.

Table 4.16.3 Standard Error Test Model 2(World Bank & Erbe 1985 approach)

VARIABLES	COEFFICIENT	COEFFICIENT/2	STANDARD ERROR	DECISION
δ EXTDEBT	0.039389	0.0196945	0.03457	Insignificant
DFI	- 0.796985	0.3984925	0.10911	Significant
CAB	0.174985	0.0874925	0.10106	Insignificant
δ RES	0.595361	0.2976805	0.12391	Significant

Source: Computation, using E-view statistical package.

Two out of the independent variables are statistically significant in explaining the behaviour of GDP. These variables are: DFI and δ RES, δ EXTDEBT and CAB are however not statistically significant in explaining the behaviour of the dependent variable (GDP) . This confirmed that δ EXTDEBT and CAB impacted negatively on the economic growth during the coverage of this study while DFI and δ RES impact positively.

Validation and testing of hypotheses: The second hypothesis (H_{02}) was tested under the Morgan Guaranty Trust version of (1986) of model 2. The hypothesis tested the effect of capital flight on economic growth.

The hypothesis is re-stated in the null form as follows;

H_{02} : Capital flight has no significant effect on the Nigeria's economic growth.

Since DFI and δ RES are significant and these variables are economic, it is concluded that they impact positively on economic growth; hence the alternative hypothesis is accepted. For δ EXTDEBT and CAB that are not significant, the the null hypothesis is accepted for them.

4.7.4 Tests for Overall Significance of Model (F-Test)

The F-test which determine the statistical significance of the entire model confirmed that the over all model is statistical significance. The formulated hypothesis was tested as follows: F-caculated=

462.6337, $F = \text{tabulated } -2.76$. Since $f\text{-calculated } (697.0697)$ is greater than $f\text{-tabulated } (2.76)$ the over model is significant, thus the overall model is significant and H_1 is accepted.

4.7.5. Tests for Presence of Autocorrelation in Model 2 (Morgan Trust (1986) Approach)

The Durbin Watson test conducted to test for the presence of autocorrelation in the model is depicted by the diagram below:

The degree of freedom = K' and $= K - 1 = 6 - 1 = 5$ and the number of years is 42 years. Thus, $*D_L = 1.230$ $*D_U = 1.786$ at 5% significant level (as in table value), $4 - D_L = 4 - 1.230 = 2.774$ and $4 - D_U = 4 - 1.786 = 2.214$

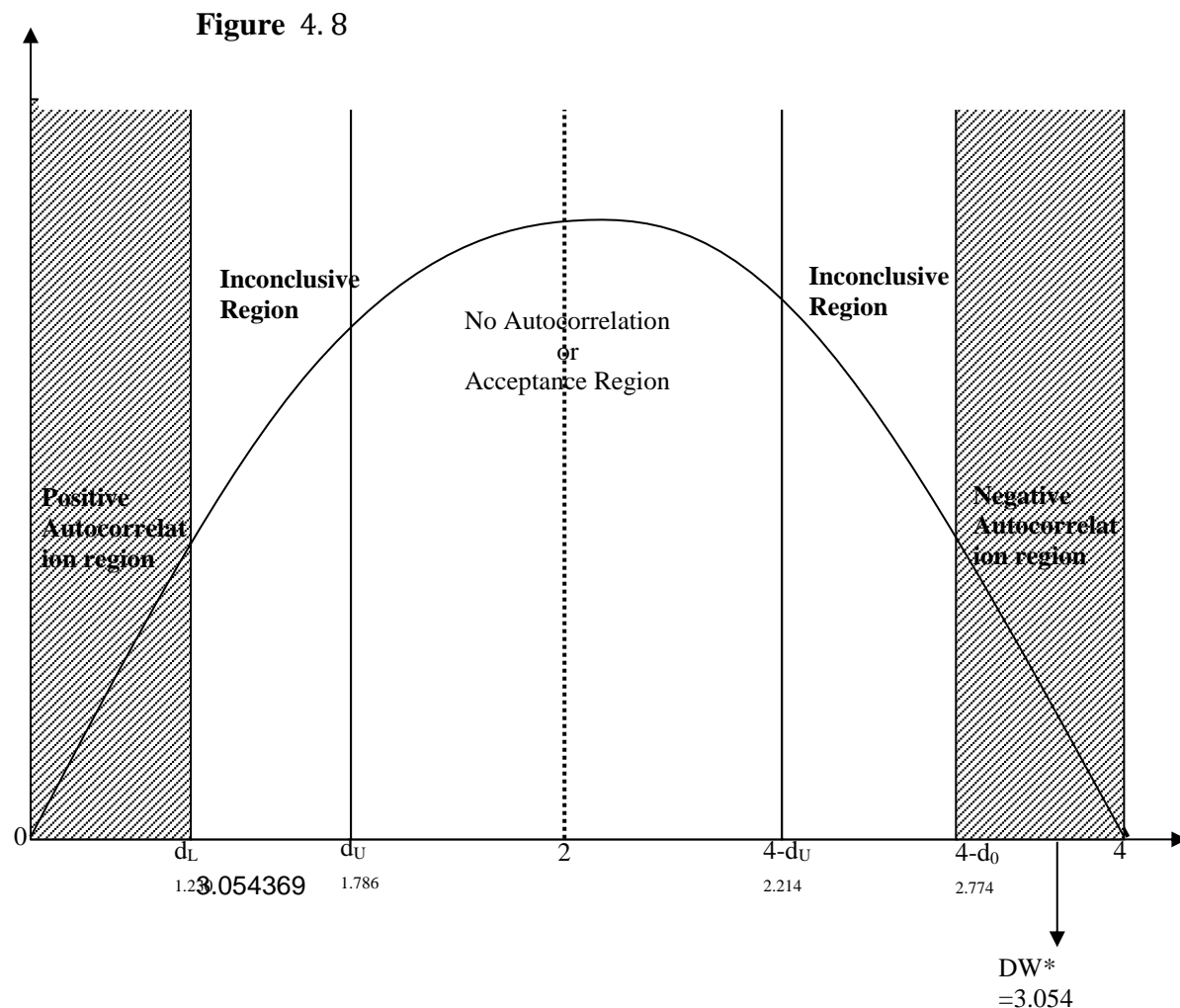


Figure 4.8: Durbin Watson graph for Model 2A (World Bank & Erbet (1985) Approach)

The graph above shows that the Durbin Watson statistics of 3.05 is above 2.00, hence the problem of autocorrelation does not arise.

Table 4.17 Result of Cointegration Test for Model 2B (Morgan Guaranty Trust 1986 approach)Series: GDP δ EXTDEBT DFI CAB RES NEXTAS

Lags interval (in first differences): 1 to 1

EIGEN VALUE	LIKELIHOOD RATIO	5% CRITICAL VALUE	1% CRITICAL VALUE	HYPOTHESISED NO OF (CEs)
0.560985	95.95913	94.15	103.18	None *
0.457967	63.03029	68.52	76.07	At most 1
0.354636	38.53317	4	54.46	At most 2
0.293191	21.01556	29.68	35.65	At most 3
0.153943	7.135782	15.41	20.04	At most 4
0.011163	0.449044	3.76	6.65	At most 5

*(**) denotes rejection of hypothesis @ 5 % (1%) Significant level

L.R. test indicates I co-integrating equation @ 5% (1%) significant level

Source: Computation, using E-view statistical package.

The table 4.17 above shows that long-run relationship (co-integration) exist among Gross domestic product and it identified determinants; external debt (δ EXTDEBT), direct foreign investment (DFI), current account balance (CAB), reserve (δ RES) and Net external Asset (δ NEXTAS). This is reflected in the likelihood value of 95.95913 which is greater than 5% critical value of 94.15. Hence, the hypothesis of no co-integration (H_0) is rejected and that of presence of co-integration (H_1) is upheld.

4. 8.1 Long-Run Model

Since a long run has been established in table 4.17, there is the need to establish a co-integration model derived from the Johansen co-integration result. The log-likelihood ratio with the lowest value was chosen. The equation with the lowest log-likelihood ratio is the first equation with the corresponding value of 252.2529. It is therefore presented below:

$$GDP = -0.009190\delta_{EXTDEBT} - 0.559950\delta_{DFI} - 0.172788\delta_{CAB} - 0.026194\delta_{RES} - 0.267205\delta_{NEXTAS}$$

$$(0.02789) \quad (0.10539) \quad (0.07333) \quad (0.09328) \quad (0.08679)$$

$$- 2.762386 \dots \dots \dots (4.15)$$

Note: Standard error statistics are given in parenthesis

From the above long-run equation, all the explanatory variables including the constant showed a negative relationship with gross domestic product on the long-run in conformity with the apriori

expectations except for net foreign assets of domestic banks. This is a wide departure from the short run results where all the independent variables were positively related to gross domestic product. The negative value of the constant parameter implied that 2.567998 if all explanatory variables are held constant, gross domestic product will decrease by 2.567998 units on the long-run. The results revealed that over, the effect of external borrowing could improve economic growth if well utilized. The DFI with a positive relationship in the short run but negative in the long run confirmed that DFI could be very beneficial to the economy if the profits accrued are ploughed back into the domestic environment. Favourable current account balance and increased or adequate external reserves have impacted positively on the Nigerian economy.

4.8.2 Error Correction Mechanism Test for Model 2B (Morgan Trust (1986) approach).

In line with the result obtained in the unit root test, the error correction mechanism showed that the ECM is stationary at level; the over-parametrized error correction model required in this analysis was from the results of the over-parametrized error correction model (ECM1) which is shown below in table 4.17.1:

Table 4.17.1 Over-Parametrized Model (ECM 1) for Model 2B (Morgan Trust (1986) Approach).
Dependent Variable = D (GDP, 2)

VARIABLES	COEFFICIENTS	STANDARD ERROR	T-STATISTICS	PROB VALUE
D(GDP(-1),2)	-0.183644	0.180833	-1.015549	0.3185
D(EXTDEBT,2)	0.013823	0.012410	1.113800	0.2748
D(EXTDBT(-1),2)	-0.003551	0.013139	-0.270236	0.7890
D(DFI,2)	0.053507	0.071463	0.748741	0.4603
D(DFI(-1),2)	-0.024731	0.079179	-0.312339	0.7571
D(CAB,2)	0.010828	0.016565	0.653682	0.5186
D(CAB(-1),2)	-0.025658	0.019272	-1.331372	0.1938
D(RES,2)	0.008494	0.025794	0.329296	0.7444
D(RES(-1),2)	0.001341	0.028179	0.047574	0.9624
D(NEXTAS,2)	0.030648	0.022491	1.362635	0.1839
ECM(-1)	-0.629236	0.165242	-4.173481	0.0006
R-squared		0.560372	Mean dependent var	0.000564
Adjusted R-squared		0.403362	S.D. dependent var	0.252172
S.E. of regression		0.194784	Akaike info criterion	-0.201106
Sum squared resid		1.062342	Schwarz criterion	0.268103
Log likelihood		14.92157	Durbin-Watson stat	2.069175

Source: Computation, using E-view statistical package.

The summary of the over-parametized ECM above shows that the coefficient of the ECM is significant with the negative sign (-). It implies its effectiveness in the correction of any deviation that may occur in the long-run. The coefficient is -0.689636 which implies a sharp adjustment rate of approximately 0.69 units to any changes that may occur on the long-run and rate of correction of past deviation in the present period. These means that the present value of GDP adjust very sharply to changes in EXTDEBT, DFI, CAB, RES and NEXTAS. In order to attain effectiveness of the model, there is the need to simplify the model to a more parsimonious model. The parsimonious model would be gotten by estimating the equation of only those variables that appear significant in the over-parametized ECM1. The table below shows the result of the parsimonious model estimated.

Table 4.17.2: Parsimonious ECM2 for Model 2B (Morgan Trust (1986) Approach)

Dependent Variables = D (GDP, 2)

VARIABLES	COEFFICIENTS	STANDARD ERROR	T-STATISTICS	PROB ABILITY VALUE
D(EXTDEBT,2)	0.020282	0.008421	2.408447	0.0216
D(DFI,2)	0.056262	0.047964	1.173008	0.2489
D(CAB(-1),2)	-0.029125	0.010718	-2.717354	0.0103
D(RES,2)	0.021311	0.015646	1.362056	0.1821
ECM(-1)	-0.633854	0.170723	-3.712769	0.0011

R-squared	0.480657	Mean dependent var	0.000564
Adjusted R-squared	0.419558	S.D. dependent var	0.252172
S.E. of regression	0.192122	Akaike info criterion	-0.342164
Sum squared resid	1.254969	Schwarz criterion	-0.128887
Log likelihood	11.67219	Durbin-Watson stat	2.402566

Source: Computation, using E-view statistical package.

From the result above, the coefficient of the ECM is further proven significant with its conformity to the over-parametized ECM. The value of the ECM shows a negative of -0.633854. This coefficient in its negative form implies that the speed of adjustment of any past deviation to long-run equilibrium in present period. It therefore indicates that the value of the GDP adjust more sharply to changes in the explanatory variables that it was in the over-parametized model.

Therefore, it can be deduced from the parsimonious model above that changes in the dependent variable (GDP) are determined by all the variables except DFI in the short-run while other variables and also, determines this changes in the long-run.

Furthermore, the table also reveals that the third variable (CAB) is inversely related with GDP with a negative coefficient of 0.029125, while the remaining four variables (EXTDEBT, DFI, RES and NEXTAS) maintained a direct relationship with GDP with their respective coefficients given as; 0.020282, 0.056262, 0.021311 and 0.019168. These therefore implies that an increase in the third variable (CAB) in the long-run will result into a decrease in the value of gross domestic product (GDP) while an increase in the value of any of the remaining four variables (EXTDEBT, DFI, RES and NEXTAS) will result into an increase in the value of Gross Domestic Product on the long-run.

The coefficient of multiple determinants (R^2) showed an approximate value of 0.48 which implies that the variables that makes up the model can account for approximately 48% of the behaviour of gross domestic product (GDP). The remaining 52% can be linked to white noise which is usually captured by other variables not present in the model.

4.8.3 Tests for the Statistical Significance of Parameters

. The table below shows the results of the standard error test conducted with the level of significance of the explanatory variables in absolute terms.

Table 4.17.3 Standard Error Test Model 2B (Morgan Trust (1986) Approach)

VARIABLES	COEFFICIENT	COEFFICIENT/2	STANDARD ERROR	DECISION
δ EXTDEBT	2.408447	1.204224	0.008421	Significant
DFI	1.173008	0.586504	0.047964	Significant
CAB	-2.717354	1.358677	0.010718	Significant
δ RES	1.362056	0.681028	0.015646	Significant
δ NEXTAS	1.234954	0.617477	0.015521	Significant

Source: Computation, using E-view statistical package.

The table above indicates that all variables except are statistically significant. This implies that all the explanatory variables are statistically significant in the explanation of the determination of Gross Domestic Product. This confirmed that all the variables impacted positively on the economic growth during the coverage of this study.

Validation and testing of hypotheses: The second hypothesis (H_{02}) was tested under the Morgan Guaranty Trust version of (1986) of model 2. The hypothesis tested the effect of capital flight on economic growth. The hypothesis is re-stated in the null form as follows;

H_{02} : Capital flight has no significant effect on the Nigeria's economic growth.

Since all the variables are statistically significant in explaining the behaviour of GDP, the alternative hypothesis is accepted for all the variables ($\delta EXTDEBT$, DFI , CAB , δRES and $\delta NEXTAS$). This was also the case of the short run model with the exception of the net foreign asset of domestic bank ($\delta NEXTAS$) with probability value of 0.9025.

4.8.4 Tests for Overall Significance of Model 2B (F-Test)

The F-test which determine the statistical significance of the entire model confirmed that the over all model is statistical significance. The formulated hypothesis was tested as follows: $F_{calculated}=697.0697$, $F_{tabulated}=2.76$

Since $f_{calculated}$ (697.0697) is greater than $f_{tabulated}$ (2.76) the over model is significant, thus the overall model is significant and H_1 is accepted.

4.8.5 Tests for Presence of Autocorrelation in Model 2 (Morgan Trust (1986) Approach)

The Durbin Watson test conducted to test for the presence of autocorrelation in the model is depicted by the diagram below:

The degree of freedom = K' and = $K - 1 = 6 - 1 = 5$ and the number of years is 42 years. Thus, $*D_L = 1.230$ $*D_U = 1.786$ at 5% significant level (as in table value), $4 - D_L = 4 - 1.230 = 2.774$ and $4 - D_U = 4 - 1.786 = 2.214$

Figure 4.9

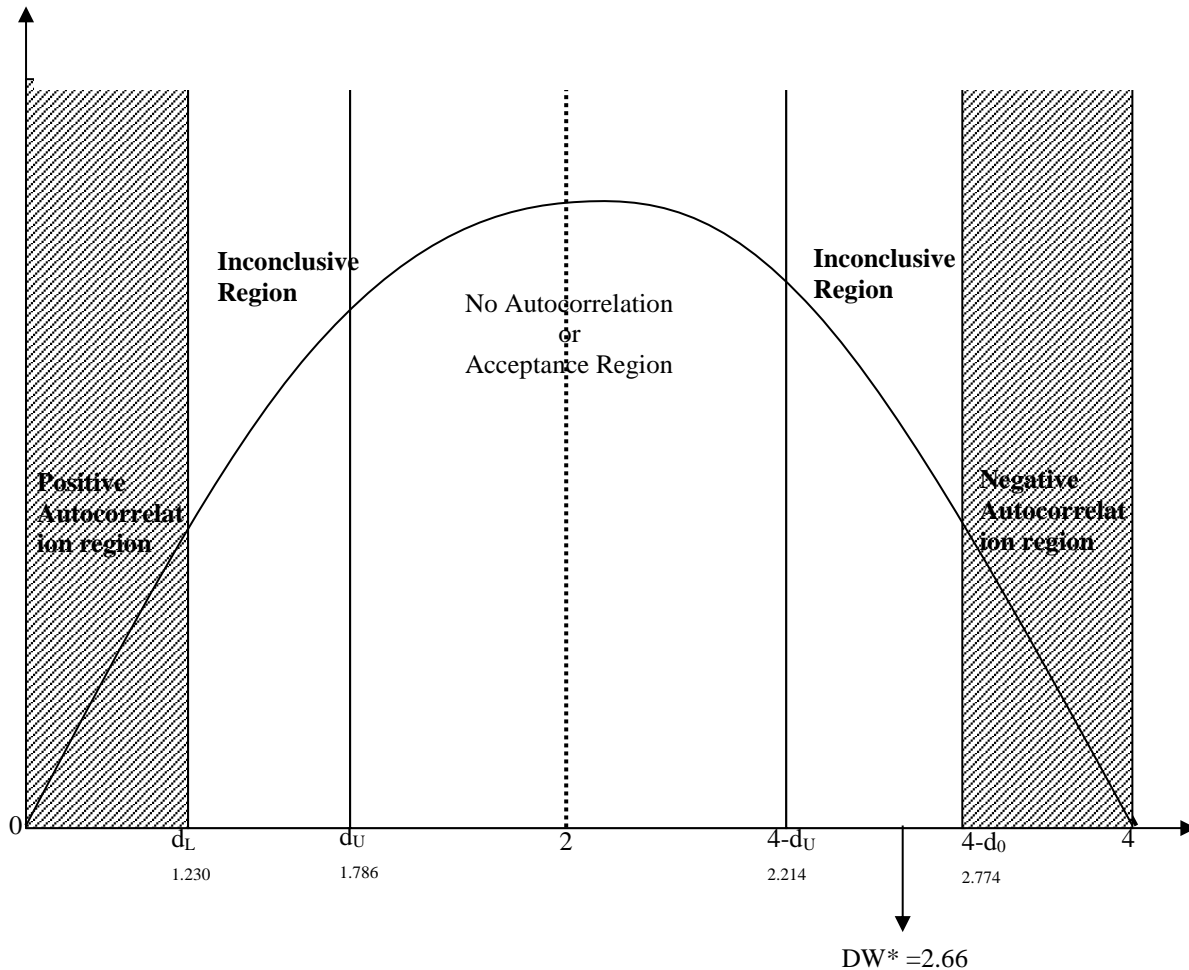


Figure 4.9: Durbin Watson graph for Model 2B (Morgan Trust (1986) Approach)

The graph above shows that the Durbin Watson statistics of 2.66 fell within the area of Inconclusive region.

This following section presents the result on the impact of capital flight on the Nigeria economic growth in the Post-SAP era (1986-2011):

Table 4.18. Presentation of Co-integration Result on Model 6B (Morgan Trust (1986) Approach)

EIGEN VALUE	LIKELIHOOD RATIO	5% CRITICAL VALUE	1% CRITICAL VALUE	HYPOTHESISED NO OF (CEs)
0.849806	112.8849	94.15	103.18	None **
0.648669	69.28095	68.52	76.07	At most 1 *
0.632812	45.22235	47.21	54.46	At most 2
0.345955	22.17911	29.68	35.65	At most 3
0.303035	12.41378	15.41	20.04	At most 4
0.163652	4.110334	3.76	6.65	At most 5 *

*(**) denotes rejection of hypothesis @ 5% (1%) Significant level

The test indicates L.R. test indicates 2 cointegrating equation(s) at 5% significance level.

Source: Computation, using E-view statistical package.

The table above shows that long-run relationship (co-integration) exist among Gross domestic product and it identified determinants; external debt ($\delta\text{EXTDEBT}$), direct foreign investment (DFI), current account balance (CAB), reserve (δRES) and Net external Asset (δNEXTAS). This is reflected in the likelihood ratio of the first two rows of the second column of the table that shows a value greater than that of the 5% critical value in the first two row of the third column respectively. Hence, the hypothesis of no co-integration (H_0) is rejected and that of presence of co-integration (H_1) is upheld.

4.9.1 Long-Run Model

From the co-integration result in the Johansen co-integration test above, it could be inferred that there is long-run relationship among the dependent and the explanatory variables. This prompted the need for the establishment of a co-integration model. This is derived from the Johansen co-integration result from which the equation with the lowest log-likelihood ratio is chosen. The equation with the lowest log-likelihood ratio is the first equation with the corresponding value of 111.3706. It is therefore presented below:

$$\begin{aligned}
 GDP_{POSTSAP} = & -0.294556_{EXTDEBT} - 0.570337_{DFI} - 0.189012_{CAB} - 0.417905_{RES} - \\
 & (0.07385) \quad (0.08302) \quad (0.06482) \quad (0.012723) \\
 & 0.491957_{NEXTAS} - 1.567038 \dots \dots \dots (4.16)
 \end{aligned}$$

(0.08871)

Standard error statistics are given in parenthesis

The above result give a direct opposite result to the Post-SAP result in the short run.in the Post-S AP short run result, all the variables including the constant parameter are all positively signed whereas from the above long-run equation, all the explanatory variables showed a negative relationship with gross domestic product. The constant parameter maintained a negative value of 1.567038 implying that if all explanatory variables are held constant, gross domestic product will decrease by 1.567038units on the long-run. This suggests that government policy such as the Structural Adjustment Programme introduced in 1986 has failed to impact the economy as expected. For any policy to impact the economy positively, such policy must be adapted to the peculiar situation in the economy and must be tailored toward the peculiar situation. As shown in the result, all variables showed contrary effect on the short-run.

4.9.2 Error Correction Mechanism

In line with the result obtained in the unit root test, above, the error correction mechanism showed that the ECM is stationary at level, therefore, an over-parametized error correction model is required in this analysis and was obtained by using the lag length to ensure that the dynamics of the model is not compromised and properly captured. The result of the over-parametized error correction model (ECM1) is presented in table 4. 18.1below:

Table 4.18.1 Over-Parametized Model (ECM1) For Model 6b

Dependent Variable = D (GDP, 2)

VARIABLES	COEFFICIENTS	STANDARD ERROR	T-STATISTICS	PROB VALUE
D(GDP(-1),2)	-0.148490	0.348981	-0.425497	0.6787
D(EXTDEBT,2)	0.032033	0.020830	1.537838	0.1523
D(EXTDBT(-1),2)	0.003211	0.030288	0.106002	0.9175
D(DFI,2)	0.051163	0.074675	0.685139	0.5074
D(DFI(-1),2)	-0.026236	0.085098	-0.308306	0.7636
D(CAB,2)	0.069881	0.035004	1.996351	0.0712
D(CAB(-1),2)	-0.008337	0.054543	-0.152852	0.8813
D(RES,2)	-0.006408	0.033366	-0.192049	0.8512
D(RES(-1),2)	-0.035490	0.063994	-0.554580	0.5903
D(NEXTAS,2)	0.006925	0.048297	0.143374	0.8886
ECM(-1)	-0.629546	0.165242	-4.173481	0.0006

$$R^2 = 0.704073$$

$$DW-STATISTICS = 1.872506$$

Source: Computation, using E-view statistical package.

The summary of the over-parametized ECM above shows that the coefficient of the ECM is significant with the negative sign (-). It implies it effectiveness in the correction of any deviation that may occur in the long-run. The coefficient is -0.629546 which implies a sharp adjustment rate of approximately 0.63units to any changes that may occur on the long-run and rate of correction of past deviation in the present period. These mean that the present value of GDP adjust very sharply to changes in $\delta EXTDEBT$, DFI , CAB , δRES and $\delta NEXTAS$.

In order to attain effectiveness of the model, there is the need to simplify the model to a more parsimonious model. The parsimonious model would be gotten by estimating the equation of only those variables that appear significant in the over-parametized ECM. The table below shows the result of the parsimonious model estimated.

Table 4.18.2 Parsimonious Model (ECM 2) For Model 6b

Dependent Variables = $D(GDP, 2)$

VARIABLES	COEFFICIENTS	STANDARD ERROR	T- STATISTICS	PROB VALUE
D(EXTDEBT,2)	0.039304	0.010005	3.928356	0.0011
D(DFI,2)	0.048641	0.044182	1.100933	0.2863
D(CAB,2)	0.086991	0.019127	4.548066	0.0003
D(RES(-1),2)	-0.026153	0.016566	-1.578742	0.1328
D(NEXTAS,2)	0.006925	0.048297	0.143374	0.8886
ECM(-1)	-0.652764	0.170723	-3.712769	0.0011

$$R^2 = 0.698553$$

$$DW-STATISTICS = 2.516736$$

Source: Computation, using E-view statistical package.

From the result above, the coefficient of the ECM is further proven significant with it conformity to the over-parametized ECM. The value of the ECM shows a negative of -0.652764. This coefficient in it negative form implies that the speed of adjustment of any past deviation to long-run equilibrium in present period. It therefore indicates that the value of the GDP adjust more sharply to changes in the explanatory variables that it was in the over-parametized model.

Furthermore, the table also reveals that only δRES is inversely related with GDP with a negative coefficient of 0.026153, while the remaining four variables ($\delta\text{EXTDEBT}$, DFI, CAB and δNEXTAS) maintained a direct relationship with GDP with their respective coefficients given as; 0.039304, 0.048641, 0.086991 and 0.006925. These therefore implies that an increase in the third variable (CAB) in the long-run will result into a decrease in the value of gross domestic product (GDP) while an increase in the value of any of the remaining four variables ($\delta\text{EXTDEBT}$, DFI, δRES and δNEXTAS) will result into an increase in the value of Gross Domestic Product on the long-run.

The coefficient of multiple determinants (R^2) showed an approximate value of 0.69 which implies that the variables that makes up the model can account for approximately 69% of the behaviour of gross domestic product (GDP). The remaining 31% can be linked to white noise which is usually captured by other variables not present in the model.

4.9.3 Tests for the Statistical Significance of Parameters

In testing for the statistical significance of each variable, the standard error test is usually employed in long-run analysis. This is done by comparing the standard error statistics with half the coefficient of each variable as given in the Johansen co-integration result in absolute terms. The table below displays the test accordingly in there absolute terms respectively.

Table 4.18.3 Standard Error Test for Model 6B

VARIABLES	COEFFICIENT	COEFFICIENT/2	STANDARD ERROR	DECISION
$\delta\text{EXTDEBT}$	3.928356	1.964178	0.010005	Significant
DFI	1.100933	0.550467	0.044182	Significant
CAB	4.548066	2.274033	0.019127	Significant
δRES	-1.578742	0.789371	0.016566	Significant
δNEXAS	0.006925	0.003463	0.170723	Insignificant

Source: Computation, using E-view statistical package.

The table above indicates that all variables except δNEXTAS are statistically significant. This implies that all the explanatory variables are statistically significant in the explanation of the determination of Gross Domestic Product.

Validation and testing of hypotheses: The second hypothesis (H_{02}) was tested under the Morgan Guaranty Trust version of (1986) of model 6B. The hypothesis tested the effect of capital flight on economic growth. The hypothesis is re-stated in the null form as follows;

H_{02} : Capital flight has no significant effect on the Nigeria's economic growth.

Since $\delta\text{EXTDEBT}$, DFI, CAB and δRES are significant; they impact positively on economic growth. Basically, these variables are classified as political and economic factors, debt volatility represents political factor and DFI, CAB and δRES represent economic factors. The result shows that financial institutional variable represented by NEXTAS did not contribute positively towards economic growth during the period. This is because an increase in the net foreign assets of domestic banks connotes capital outflow from the domestic economy to other Countries. Based on the above results, the alternative hypothesis is accepted for $\delta\text{EXTDEBT}$, DFI, CAB and δRES because they are statistically significant in explaining the behaviour of economic growth represented by GDP while the null alternative is accepted for δNEXTAS that is not statistically significant in explaining the behaviour of GDP.

4.9.4. Tests for Overall Significance of Model 6B (f-test)

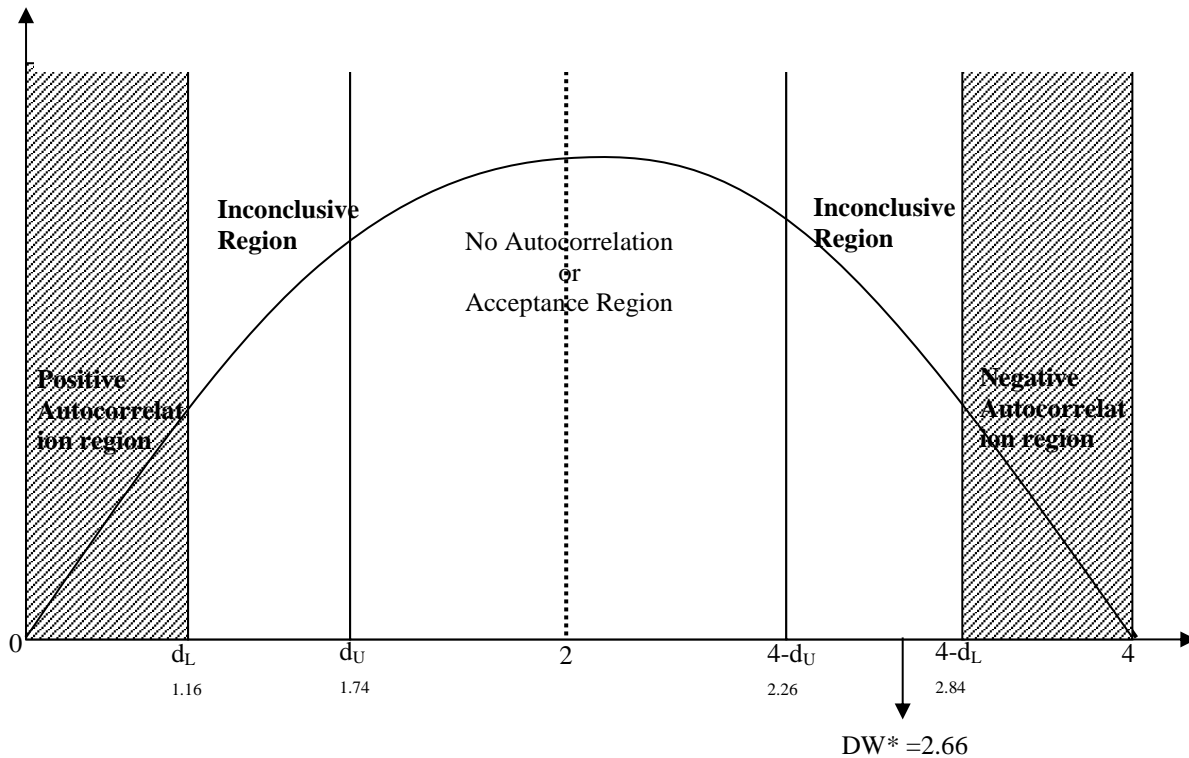
Base on the F-calculated and F-tabulated values, the F-statistical test is shown as: $F\text{-cal} = 697.0697$, $F\text{-tab} = 2.76$. Since $F\text{-cal}$ (697.0697) is greater than $F\text{-tab}$ (2.76), the model is said to be statistically significant in explaining the behaviour of GDP. We therefore accept the Alternate hypothesis (H_1) and reject the Null hypothesis (H_0).

4. 9.5 Tests for the Presence of Autocorrelation in the Model

The presence of autocorrelation is tested using the Durbin Watson test. The DW statistics gotten from the parsimonious model was used in other to obtain the most reliable result after all adjustment has been made using the following variables: $DW\text{ statistics} = 2.6561 \simeq 2.66$

The degree of freedom = K' and = $K - 1 = 5 - 1 = 4$ and the number of years is 25 years. Thus, $*D_L = 1.16$ $*D_u = 1.74$ at 5% significant level (as in table value), $4 - D_L = 4 - 1.16 = 2.84$ and $4 - D_u = 4 - 1.74 = 2.26$

Figure 4.10



Graph 4.10 above shows that the Durbin Watson statistics for Model 6B (2.66) that falls in the area of Inconclusive region as indicated in the figure. However, since the value is above 2, it is accepted as reliable

4.10 Policy change, Capital Flight and Economic Growth in Nigeria

Analyses of the pre-SAP and post-SAP eras brought out vividly the policy effect adopted by the Nigerian government in 1986. The major objectives of the policy include: to restructure and diversify the productive base of the economy in order to reduce dependency on the oil sector and on imports, to achieve fiscal and balance of payments viability over the period, to lay the basis for a sustainable non-inflationary growth, to reduce the dominance of unproductive investment in the public sector and to improve that sector's efficiency and enhance the growth potential of the Nigerian economy.

From model 3 and 4, the Pre-SAP analysis, change in external debt (EXDEBT), gross capital formation (GCF), deposit rate (DR), private sector credit (PRIVCR) and government current expenditure (GOCE) directly influenced and induced capital flight. This connotes that increase in any of these variables led to illegal capital outflow of capital from Nigeria. Ordinarily, increase in these parameters should encourage capital retention and increase investment in the domestic economy. On the other hand, degree of openness (DOP), inflation rate (INF) and interest rate differential had negative or inverse effect on capital flight. Increase or decrease in these variables had opposite effect on the level of capital flight. However, in the Post-SAP regime, the policy change brought about some noticeable changes on the economy. The Structural Adjustment Programme introduced led to increase borrowed funds, opened up the economy and put pressure on the general price level within the economy. Due to political and economic uncertainties experienced during the period, external debt became very volatile and this in turn led to increase capital flight. The volatility nature of the country's debt was manifested by the positive relationship between change in external debt and capital flight during the period.

The new economic policy (SAP) also brought about inflation induced rate. For example, Inflation rate increased from 5.4% in 1986 when SAP was introduced to unresedented 40.9% in 1989, this was evidenced by the negative sig exhibited by inflation rate in the result of the analysis. The financial institutions in particular witnessed a rapid transformation as a result of introduction of the new policy (SAP). The institution was deregulated and liberalized. The interest was no longer fixed but left to the forces of supply and demand to determine. This improved the efficiency of the financial institutions because of their ability to make the best use of their financial resources. This change was noticed in the results with the deposit rate (DR) and private sector credit (PRIVCR) that were positively signed during the pre-Sap era now negatively signed. The implication of the negative signs of the financial institution's variables is that improvement in financial institution will increase public confidence, promote domestic investment and reduce capital flight. Generally, change in external debt was the most statistically significant variable that propelled capital flight in the post-SAP period.

Results from model 5 and 6 analyses, the results revealed that the Post-SAP era brought about increased foreign direct investment (DFI) to Nigeria. Evidence from the analysis showed that change

in reserves (δRES) and direct foreign investment (DFI) had positive impact on the economy. However, the results revealed that current account balance (CAB) and net assets of domestic banks ($\delta NEXTAS$) had negative impact on the economy during the period under consideration. This is expected because for current account balance to generate positive balance of trade that could impact positively on the economy export must be more than imports and this is not yet a reality in Nigeria. Again the increased level of uncertainties in the financial industry in 1990s and 200s has led to increase in the net asset of domestic banks abroad. These funds are made available for the foreign economic growth at the expense of domestic economy.

Apart from the above, the trend of capital flight in Nigeria since 1970 reveals the proportion of capital flight under different regimes and policies in Nigeria. These regimes include the civilian administration, military administration, regulated and deregulated economic policies eras. The graph shown below gives the total capital flight estimates within the period under study. The estimate is based on the residual approach of the World Bank adopted for the study. A critical appraisal of the diagram shows that capital outflow is on the increase whenever there is transition from one government to another. The first level of spontaneous increase that was recorded in the level of capital flight was recorded within 1973 to 1975 which coincided with the period of oil boom. Ever since then, the level of capital flight has always been on the increase as a result of government officials moving out funds that are meant to be used for developmental process to another country. A significant increase was also recorded during the 1993 Military transition to Civilian era up to 2009. An all-time increase was record in 2010 with a massive movement of funds from the country.

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CHAPTER FIVE

DISCUSSION AND SUMMARY OF FINDINGS

5.1 Discussion of Findings

Generally, the empirical investigation from the study has established both short and long run relationships between the dependent and independent variables. In model 1, 3 and 4, Change in External Debt ($\delta EXDEBT$), Private Sector Credit ($PRIVCR$), Government Current Expenditure ($GOCE$) and Degree of Openness (DOP) are statistically significant in the model in the short run while Inflation rate (INF), Gross capital formation (GCF), Deposit rate (DR) and Government Current Expenditure ($GOCE$) are the main determinants of capital flight in the long run. These variables had greatly impact on the level of capital flight in Nigeria within the period under consideration. The relationship between capital flight and inflation can best be explained by the continuous depletion of every naira retained in the country. The inflation rate has been responsible for the change in the value of money over time and to a large extent causes the depletion in the value of any country's currency as the inflation in such economy is on the increase.

The change in the fixed asset and stock of a country over a period of time captured by the Gross capital formation (GCF) is expected to maintain a negative relationship with capital flight. This is because the level of capital formation shows the rate of change that exists in the capital account of a nation. In the short-run analysis, the coefficient of Gross Capital formation shows conformity with *a priori* expectation. Again, Direct Foreign Investment (DFI) and current Account Balance (CAB) are statistically significant in explaining the behaviour of the dependent variable (GDP) in the short run, whereas Direct Foreign Investment (DFI) Change in External Reserve (δRES) and Net Foreign Asset of Domestic Financial Institution ($\delta NEXTAS$) are very significant in explaining the behaviour of economic growth in the long run. However, Change in External Debt ($\delta EXDEBT$) is not significantly relevant in explaining the behaviour of economic growth represented by Gross Domestic Product (GDP). Thus the null hypotheses are accepted for parameters that are not significant in explaining the behaviour of the capital flight (KF) and gross domestic

product (GDP) dependent variables while the alternative hypotheses are accepted for parameters that are significant in explaining the behaviour of capital flight (KF) and gross domestic product (GDP).

The study shows that the positive relationship between external debt and capital flight in both the short and long run implies that increase in external borrowing by the Nigerian government has also led to increase in the level of capital flight. The implication of the above scenarios is that the debt incurred by the Government does not translate to Economic Development because of diversion, corruption and mismanagement by public office holders; this is conformity with the findings of Ojo (1992) for Nigeria and Nyatepe-Coo (1994) for seven sub-saharan African Countries. Rather than been beneficial to the economy, debt has become a serious burden on the government and on the citizens at large to the point that an increasing external debt causes reduction in Nigeria External reserves as there exists an increasing trend in debt servicing payment which causes a current account deficit. This is the assertion of the volatility theory argued by Bulir and Hamann (2003) and this is the reality in most developing economies. Ordinarily, increased external borrowing is expected to boost public sector expenditure, create domestic investment and improve the economic condition. The findings specifically revealed that Financial Institutions have a major role to play through their activities in curbing capital flight in Nigeria. This was demonstrated by the relationship of Inflation rate, Credit to Private sector and Deposits rate with capital flight in this study. A high inflation rate causes increase in capital flight while a relatively low level of banks deposit rate and credit to Private sector by financial institutions increase the rate at which money is being flown out of the country to a foreign economy. Just like the inflation rate indicates, Deposit rate also shows conformity with the expected result because it maintains a negative relationship with the dependent variable both in the short and in the long run. On the short-run, Credit to Private sector (PRIVCR) shows a positive relationship with Capital flight. This is in contrary to the result expected. The reason for the short term result is that funds given out for investment purpose may not immediately manifest until long period. This is more reason why short-run analysis of investment may look as if it enhances capital flight because the source of some of the equipments needed for these investments might be other country, thereby making it look as if the capital is flown abroad, but it gives a sign of relief when these investments start yielding returns. This is where the

long-run behaviour comes in and shows the real relationship between capital flight and credit to private sector as negative. On the long-run, credit to private sectors shows a negative relationship with capital flight showing conformity with the expected result as stated earlier. These findings confirm the studies of Gurley and Shaw, 1956, McKinnon, 1976, Ojo and Wole, 1982 and Adegbite, 2007 on the role financial institutions on economic growth and development of the economy. This finding confirms that financial institutional factors contribute substantially to the level of capital flight in Nigeria.

The interest rate differential and the domestic interest rate show positive relationship on the short-run. This is in conformity with *a priori* expectation set for this study. It shows herein that as the margin between the country's interest rate and that of the United States increases, capital flight will be on the increase. Meanwhile, on the long-run, United State interest rate differentials show a negative relationship with capital flight. This may be attributed to the rate of exchange depletion of the Nigerian currency. The continuous increase in the value of other country's currency against the naira may be an explanatory factor for the deviation on the long-run. Government current expenditure gave a positive coefficient on the short-run in contrast to the prior expectation stated earlier. This is as a result of diversion of government expenditures and ineffective use of such expenditures. Meanwhile, a contrary result to the short-run is got in the long-run analysis, as several adjustments would have been made to the scenario over time, thereby given the expected result. The coefficient of multiple determinations (R^2) for both model 1A and 1B (the World Bank approach and the Morgan Trust approach) gave approximately the same value on the short-run with a coefficient of 0.99 implying 99% explanation of the behaviour of capital flight by the totality of the variables employed in the model in the short-run but differ in the long run with 0.85% and 0.79% respectively. Models 2A and 2B also gave the same value of 0.93% coefficient of multiple determinations (R^2) and 0.85% and 0.86% in the long run respectively.

In analyzing the effect of capital flight on economic growth in Nigeria, Direct Foreign Investment shows a negative effect on the Gross Domestic Product, this is in contradiction to the expected result because an increase in Direct Foreign Investment should impact positively on the level of economic growth. Also, the behaviour of Current Account Balance which shows a negative and contrary opinion to the prior

expectation is caused by the excessive import of consumables, rather than the importation of investment-able goods that are worthy of pushing the development of the country on the long-run. Increase in external reserves shows a negative effect on Gross Domestic Product on the long-run. This has no positive impact on the economy. The Morgan Trust approach to this study shows similar results with the World Bank approach with the exception of Change in External Reserve which is positively related to economic growth in the long run.

The the Post-SAP regime analyses show that implementation of Structural Adjustment Programme introduced led to increase borrowed funds, opened up the economy and put pressure on the general price level within the economy. Due to political and economic uncertainties experienced during the period, external debt became very volatile and this in turn led to increase capital flight. The volatility nature of the country's debt was manifested by the positive relationship between change in external debt and capital flight during the period.

The new economic policy (SAP) also brought about inflation induced rate. For example, Inflation rate increased from 5.4% in 1986 when SAP was introduced to unresedented 40.9% in 1989, this was evidenced by the negative sign exhibited by inflation rate in the result of the analysis. The financial institutions in particular witnessed a rapid transformation as a result of introduction of the new policy (SAP). The institution was deregulated and liberalized. The interest was no longer fixed but left to the forces of supply and demand to determine. This improved the effcience of the financial institutions because of their ability to make the best use of their financial resources. This change was noticed in the results with the deposit rate (DR) and private sector credit (PRIVCR) that were positively signed during the pre-Sap era now negatively signed. The implication of the negative signs of the financial institution's variables is that improvement in financial institution will increase public confidence, promote domestic investment and reduce capital flight. Generally, change in external debt was the most statistically significant variable that propelled capital flight in the post-SAP period.

Also, results from model 5 and 6 Post SAP analyses revealed that the Post-SAP era brought about increased foreign direct investment (DFI) to Nigeria. Evidende form the analysis showed that change

in reserves (δRES) and direct foreign investment (DFI) had positive impact on the economy. However, the results revealed that current account balance (CAB) and net assets of domestic banks ($\delta NEXTAS$) had negative impact on the economy during the period under consideration. The capital flight also revealed that policies distortions brought about by political unrest and instability, as well as, unfavourable economic environment encourages capital flight. The trend analysis of capital flight in Nigeria also shows that capital flight was high during transition from one political regime to another. This study finally confirmed that capital flight has a damaging and adverse effect on economic growth because it constitutes a diversion of scarce resources away from the domestic investment and other productive activities.

5.2 Summary of Findings

Findings in this study show that each of the independent variables adopted has contributed towards the behaviour of the dependent variables (Capital flight (KF), and Gross Domestic Product (GDP). In models 1A and 1B which analyzed the determinants of capital flight in Nigeria, the Degree of Openness (DOP) shows a positive relationship with the capital flight in the short run, this portrays a relatively direct relationship which can be explained by the behaviour of the level of foreign trade in the country. Apparently, the aprior expectation asserts that the degree of openness (DOP) should maintain a positive relationship with capital flight. Inflation rate (INF) which is expected to maintain a positive relationship with capital flight (KF) is statistically proven with it positive coefficient both on the short and long-run. From model 2A and 2B, the effect of capital flight on economic growth from the view point of the World Bank, all variables are expected to be positively related to Gross Domestic Product regardless of the magnitude. Interestingly, all the variables show conformity with *a prior* expectation from the analyses of Ordinary least Square results in the short-run. But on the long, only the change in External Debt ($\delta EXDEBT$) shows conformity with *a prior* expectation.

5.3 Implication of Findings

The implication of a positive relationship between DOP and KF in the short run is that as a nation increases her international trading activities, there will be a fictitious umbrella under which capital that are supposed

to be meant for domestic production can be taken out of the country into another economy. Meanwhile, on the long-run, a different situation is observed in this analysis because the degree of Openness (DOP) shows a negative relationship with capital flight, giving a reverse result to the expected result. This sudden deviation of the long-run results from the expected result may be as a result of increases in export level or improvement in the level of political and economic stability which the nation has witnessed in the last few years. Inflation rate which maintains a positive relationship with the capital flight estimate in both the short and long run implies that inflation rate is a major determinant of whether people will move their capital out of the domestic economy or invest same in the economy.

Generally, those with idle cash will prefer to take their money to an economy where the value of money will not drop very fast, likewise, investors will prefer to invest in an economy where efficient profit that will be of great value rather than be in economy where each naira made would be grossly deflated with high rate of inflation. Thus, the situation of continuous increase on inflation rate in Nigeria must be checked. Gross Capital Formation which shows the change in the level of investment in fixed asset in an economy was appropriately signed with a negative relationship with capital flight in the short run but revealed the opposite in the long run. This implies that the country specific risk such as physical movement of cash outside the bank which is triggered by the high rate of corruption in the country has been on the increase. Money move with brief case and containers may be the explanatory factor for this adverse reaction of the gross capital formation on the long-run depletion of gross capital formation (GCF) and negative effect on the economy.

The positive relationship between external debt and economic growth in the short and long long run implies that increase in external borrowing by the Nigerian government has also led to increase in the level of capital flight. The implication of the above senerio is that the debt incurred by the Government does not translate to Economic Growth because of diversion, corruption and mismanagement by those in charge. Rather than been beneficial to the economy, debt has become a serious burden on the government and on the citizens at large. Previous studies revealed that most of these funds were diverted through corruption by

the government functionaries back to other countries. (Paul Coier and Anke 2004). Ideally, external borrowings and aids are expected to induce or attract foreign private capital and as such improve the domestic economy. However, the increase in the proportion of external debt has not translated into visible economic growth. Increased external borrowing is expected to induce domestic investors to retain a greater proportion of their wealth within the economy, but in a situation where increased debt results in greater proportion of private wealth to be held outside the country, the domestic economy cannot be developed.

Deposit rate which maintains a negative relationship with the level of capital flight implies that increase in the country's deposit rate will discourage the movement of idle cash out of the shore of the country and make the citizens to keep their money at their reach provided it is safe and promises a better return than moving it to an unsafe region where they may also be prompted to pay rentage or transfer cost. It is when the domestic banking institutions cannot give adequate return to investor at home that the investors move their funds to other economies that promise higher returns on deposits and other investments. The negative sign of Credit to Private Sector (PRIVCR) with capital flight estimates in the models implies that the more available of credit the Banks make available to the private sectors, the more investments will be created in the economy at the expense of capital flight. The positive sign of the United State of America interest rate differential in the long run shows clearly that the rationale for moving money abroad by Nigerian is not only motivated by pure investment motive but simply to find a safe place for their ill gotten wealth and stolen public money. Government Current Expenditure which revealed a positive sign with the dependent variable in the short run is evidence that high proportion of government spending is on imported consumable goods by Nigeria. Whenever the government public expenditure is on import at the expense of exports, the foreign economy will continue to grow at the expense of the domestic economy and the level of capital flight will be on the increase.

The implication of the negative relationship of DFI with GDP in model 2 is that, despite the effort of the government to attract DFI into the country, DFI has not impacted the economy in terms of investment, employment generation and income. This however may be attributed to the political and economic instability, as well as, poor infrastrutures within the country that has forced so many huge investments into

the corporate graveyard.. To benefit maximally from DFI, effort must be made by the government to solve the above economic, political and security issues. The implication of the negative relationship between CAB and GDP is that Nigeria is a net importing economy thereby destroying the productive base of the economy. There is the need to improve the productive capacities within the economy in order to improve the level of economic growth. Again, the negative relationship between change in External Reserve (δRES) and GDP implies that mere accumulation of external reserve does not automatically translate to economic growth. To benefit from external reserve, the domestic economy must improve her productive capacity, as well as ensure investment friendly environment. Although, change in External Reserve (δRES) Direct Foreign Investment (DFI) are positive to Gross Domestic Product in the Short-run, the long-run increasing trend in External Debt makes government to finance foreign debt from external reserve, hence, a decrease in External Reserve. This has a multiplier effect on the economy as foreign investors are not encouraged by increase in foreign debt of Nigeria and those already in the country chooses to repatriate profit to their foreign economy. All these will cause a Current Account Balance (CAB) Deficit in the long run which also reduces Gross Domestic Product (GDP).

Foreign Direct Investment (FDI) and Gross Domestic Product (GDP) are among the largest sources of external finance from developing countries including Nigeria. The empirical result of both positive in short run and negative in long run, relationship observes in the model formulated indicates that foreign direct investment could have both adverse and beneficial effect in the economy. For instance, FDI inflows into an economy may facilitate capital flight or mark a reduction in capital flight. If the returns from foreign direct investment FDI are repatriated into foreign countries, it is detrimental, but if the returns on FDI are invested into the local economy, there will be improvement in the Gross Domestic product. Chander (1996) in his study finds out that FDI inflows into an economy are always associated with a reduction in capital flight provided there is adequate and effective management of the domestic economy. Any government policy that enhances efficiencies capital market will encourage capital inflows and discourage capital flight, thereby improving the economy of the host country. The inclusion of change in foreign asset of Domestic Banking System ($\delta NEXTAS$) according to Morgan (1986) Capital flight estimate has a little modification, while in

the Morgan trust approach, Change in External Reserve promises a positive relationship with Economic performance on the long-run as oppose to change in external debt in the case of World Bank and Erbe (1985)

The Pre-SAP, Post-SAP showed the degree to which each of the independent variable impact capital flight in Nigeria under different economic policies. In the Pre-SAP analysis, change in external debt (EXDEBT), gross capital formation (GCF), deposit rate (DR), private sector credit (PRIVCR) and government current expenditure (GOCE) directly influenced and induced capital flight while in the Post-SAP regime, the policy change brought about more open economy and increase borrowed funds as well as put pressure on the general price level within the economy. Due to political and economic uncertainties experienced during the period, external debt became very volatile and this in turn led to increase capital flight. The volatility nature of the country's debt was manifested by the positive relationship between change in external debt and capital flight during the period.

Results from model 5 and 6 analyses, the results revealed that the Post-SAP era brought about increased foreign direct investment (DFI) to Nigeria. Evidende form the analysis showed that change in reserves (δRES) and direct foreign investment (DFI) had positive impact on the economy. However, the results revealed that current account balance (CAB) and net assets of domestic banks ($\delta NEXTAS$) had negative impact on the economy during the period under consideration. This is expected because for current account balance to generate positive balance of trade that could impact positively on the economy export must be more than imports and this is not yet a reality in Nigeria. Again the increased level of uncertainties in the financial industry in 1990s and 200s has led to incease in the net asset of domestic banks abroad. These funds are made available for the foreign economic growth at the expense of domestic economy. Analyses also show that policies distortions brought about by political unrest, along with political instability and unfavourable economic environment encourage capital flight. However, the current consolidation and reforms in the economy couple with the current democratic regime in Nigeria is already having positive effect on the political and economic stability of the country.

The operations of Economic and Financial Crime Commissions and the Independent Corrupt Practices and other Related Offences Commission have increased the international investors' in the Nigerian economy.

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CHAPTER SIX

CONCLUSION, RECOMMENDATIONS AND CONTRIBUTIONS TO KNOWLEDGE

6.1 Conclusion

Findings from the study show that major determinants of capital flight in Nigeria within the period under consideration are: political factors captured by debt volatility, ($\delta EXDEBT$), economic factors captured by: Degree of Openness(DOP), Inflation rate (INF) and Gross Capital Formation (GCF), institutional factors measured by Deposit rate (DR), and Credit to private sector (PRIVCR). However, political uncertainty measured by Change in External Debt ($\delta EXDEBT$) and Inflation rate (INF) contributed the most. Again, change in external debt ($\delta EXDEBT$) has negatively impact economic growth in the short run while Direct Foreign Investment (DFI), Change in Foreign Asset of Domestic Banking System ($\delta NEXTAS$) and Change in External Reserve (δRES) positively impact the economic growth. Based on findings, it was finally concluded that if appropriate and adequate measures are put in place to address and correct the various economic and political factors identified in the study, the incidence of capital flight could be reversed and stemmed.

6.2 Recommendations

Based on findings from the study and their discussion, the following were recommended:

1. There should be a change of attitude on the part of public office holders who divert economic funds to personal accounts abroad.
2. Government should provide enabling institutions for domestic business and foreign investors in order to halt the massive capital outflow and attract investment.
3. The monetary policies of the government should be well implemented to moderate inflation rate in Nigeria.
4. Funds from foreign sources in form of loans, gifts, or aid should be put into judicious use in order boost and improve the level of Nigeria economy growth.
5. Proceeds recover from corrupt officials (within or outside the country) should be ploughed back into the economy.

6. Government should strengthening all anti-corruption institutions and agencies, such as the Economic and Financial Crimes Commission and the Independent Corrupt Practices and other Related Offences Commission and makes them more effective in checking corruption.
7. The Nigerian political class and public holders must be more transparent and be opened to public scrutiny.
8. Adequate legal framework to fight and curb financial crime without delay should be put in place.
9. The Pre and Post-SAP analyses show that government should the government should implement policies that are well thought out and suitable for the Nigerian environment.
10. Finally, all the main factors identified in this study to induce capital flight should be properly addressed and adequate measures taken to reverse the trend of capital flight in Nigeria.

6.3 Contributions to Knowledge

The major contributions of this study to knowledge are derived from the analyses of the set objectives of the study, these include:

1. The study formulated a model that identified that economic, political and institutional factors as the main determinants of Capital Flight in Nigeria. Specifically, it affirms that Change in ExternalDebt ($\delta EXDEBT$ Inflation rate (INF), Government Current Expenditure (GOCE) and Financial institution instability are the major determinant of Capital Flight in Nigeria. This discovery will enable the policy making bodies to tackle appropriately the problem of capital flight in Nigeria.
2. The study exposed the volatile nature of the Nigeria external debt which has made the Nation's external debt a burden rather than promoting economic growth.
3. The study established that capital flight variable like change in external debt has a negative impact on the economic growth within the time frame of the study while other variables such as direct Foreign Investment and change in external reserve have positive impacts.
4. The study established that the occurrence of capital flight was drastically high during transitions of government from one regime to another.

5. The study led to the development of a conceptual framework that shows the interaction of capital flight variables and economic growth.

6.4 Suggestions for further Research.

The following areas not covered by this study are recommended for further study:

1. Political factors, capital flight and economic growth in other developing economies.
2. Political and Economic Strategies for Curbing Capital Flight in Developing Economies.
3. Institutional Factors and Capital Flight in Developing Countries.

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APPENDIX A1

DATA PRESENTATION FOR THE FORMULATED MODELS

YEARS	L^KFW	L^EXTDBT	L^DOP	L^INF	L^GCF	L^DR	L^PRIVCR	USIRD	L^GOCE
			-						
1970	6.85583	-0.22314	1.16828	2.624669	6.280021	1.098612	5.881789	-0.35667	6.57382
			-						
1971	7.331715	1.252763	1.03086	2.772589	6.263208	1.098612	6.292217	1.446919	6.713685
			-						
1972	7.560913	4.467057	1.08678	1.163151	6.036677	1.098612	6.47963	1.574846	6.91998
			-						
1973	7.483413	2.424803	0.90165	1.686399	6.050676	1.098612	6.619873	0.165514	6.870572
			-						
1974	7.622468	3.817712	0.91579	2.595255	6.657112	1.098612	6.801417	-1.02165	7.324556
			-						
1975	7.644967	3.314186	0.90981	3.523415	6.723832	1.386294	7.199843	-0.4943	7.91385
			-						
1976	7.74049	3.206803	0.80654	3.054001	7.550188	1.386294	7.632609	1.160021	8.246801
			-						
1977	7.88322	2.251292	0.76121	2.734368	7.609119	1.386294	7.962875	0.122218	8.247796
			-						
1978	8.489863	6.787845	0.88358	2.809403	7.361058	1.609438	8.308904	0.198851	7.937375
			-						
1979	7.911287	5.884436	0.82965	2.4681	7.874131	1.609438	8.497419	0.985817	8.066898
			-						
1980	8.250176	5.542439	0.74549	2.292535	5.842094	1.791759	8.73781	1.667707	8.477454
			-						
1981	8.556395	6.140746	0.69095	3.039749	9.775631	1.791759	9.056029	2.109	8.486053
			-						
1982	9.639014	8.77774	0.95011	2.04122	7.724358	2.014903	9.275036	1.040277	8.613594
			-						
1983	9.268694	7.472103	1.17474	3.144152	8.40436	2.014903	9.364609	-0.40048	8.466068
			-						
1984	9.242933	8.350194	1.29902	3.678829	8.58401	2.251292	9.430514	0.239017	8.670343
			-						
1985	9.306922	7.820801	1.28518	1.704748	6.681231	2.251292	9.478101	1.625311	8.932793
			-						
1986	9.269355	5.486911	1.53479	1.686399	7.993958	2.251292	9.632168	1.321756	8.948573
			-						
1987	11.13561	10.99098	0.78023	2.322388	7.944882	2.639057	9.956222	2.366498	9.657983
			-						
1988	10.69425	10.40932	0.97154	3.64545	6.490572	2.674149	10.21561	2.091864	9.873513
			-						
1989	11.67706	11.57531	0.89233	3.71113	9.134895	2.797281	10.3223	2.61007	10.16563
			-						
1990	11.42837	10.972	0.54197	2.014903	9.532119	2.933857	10.42072	2.873565	10.49736
			-						
1991	10.72419	10.30358	0.39141	2.564949	8.569577	2.65956	10.62989	2.536075	10.55173

			-						
1992	12.41101	12.28216	0.42327	3.795489	10.16273	2.778819	10.97032	3.226844	10.87869
			-						
1993	11.71098	11.39505	0.57608	4.046554	10.18702	2.813011	11.75287	1.909543	11.82574
			-						
1994	11.53173	9.659414	0.89184	4.043051	9.099688	2.60269	11.87356	2.617396	11.40729
			-						
1995	13.77849	13.41212	0.12511	4.287716	10.51041	2.53449	12.10074	2.488234	11.75689
			-						
1996	12.48787	11.50837	0.36716	3.377588	11.04313	2.458734	12.38253	2.53449	11.73199
			-						
1997	12.55091	9.97059	0.29451	2.140066	10.57896	1.568616	12.66415	2.695978	11.97391
			-						
1998	13.09279	10.52097	0.53307	2.302585	4.862908	1.702928	12.77126	2.590767	12.09009
1999	16.80244	16.80846	-0.4427	1.88707	9.212009	1.673351	12.97425	2.941276	13.01625
			-						
2000	13.6498	13.1616	0.44691	1.931521	11.51309	1.665818	13.18134	2.523326	13.04245
			-						
2001	12.88067	11.27603	0.38155	2.939162	10.63976	1.702928	13.54758	2.678965	13.26958
			-						
2002	13.67869	13.53658	0.75247	2.557227	11.76203	1.423108	13.74347	3.255786	13.45425
2003	14.13535	13.20936	-0.4961	2.639057	12.81318	1.413423	13.90767	2.938103	13.79969
			-						
2004	14.2536	12.92863	0.54905	2.70805	7.537057	1.432701	14.16734	2.776954	13.84769
			-						
2005	14.25456	14.60178	0.37179	2.884801	10.95937	1.342865	14.4244	2.573375	14.01739
			-						
2006	13.795	14.6236	0.57608	2.104134	13.51925	1.144223	14.64433	2.381396	14.07031
			-						
2007	14.97612	9.9224	0.52492	1.686399	12.87412	1.266948	15.11534	2.385086	14.27879
			-						
2008	14.1812	11.03651	0.45918	2.451005	11.6732	1.043804	15.75	2.622492	14.56568
			-						
2009	14.70391	11.48515	0.61101	2.525729	13.81454	0.985817	16.02401	2.56341	14.6485
			-						
2010	16.14698	11.50695	0.57377	2.617396	13.77646	0.792993	16.13368	1.978239	15.01256
			-						
2011	16.30301	12.24041	0.42802	2.379546	12.17821	0.357674	16.18202	1.978239	14.93207

GUARANTY TRUST APPROACH

YEARS	L^KFM	L^EXTDBT	L^DOP	L^INF	L^GCF	L^DR	L^PRIVCR	L^USIRD	L^GOCE
			-						
1970	6.812345	-0.22314	1.16828	2.624669	6.280021	1.098612	5.881789	-0.35667	6.57382
			-						
1971	7.236123	1.252763	1.03086	2.772589	6.263208	1.098612	6.292217	1.446919	6.713685
			-						
1972	7.54094	4.467057	1.08678	1.163151	6.036677	1.098612	6.47963	1.574846	6.91998
			-						
1973	7.380754	2.424803	0.90165	1.686399	6.050676	1.098612	6.619873	0.165514	6.870572
			-						
1974	6.952633	3.817712	0.91579	2.595255	6.657112	1.098612	6.801417	-1.02165	7.324556
			-						
1975	7.625302	3.314186	0.90981	3.523415	6.723832	1.386294	7.199843	-0.4943	7.91385
			-						
1976	7.724579	3.206803	0.80654	3.054001	7.550188	#NUM!	7.632609	1.160021	8.246801
			-						
1977	7.698256	2.251292	0.76121	2.734368	7.609119	1.386294	7.962875	0.122218	8.247796
			-						
1978	8.112468	6.787845	0.88358	2.809403	7.361058	1.609438	8.308904	0.198851	7.937375
			-						
1979	6.534661	5.884436	0.82965	2.4681	7.874131	1.609438	8.497419	0.985817	8.066898
			-						
1980	7.271356	5.542439	0.74549	2.292535	5.842094	1.791759	8.73781	1.667707	8.477454
			-						
1981	7.679205	6.140746	0.69095	3.039749	9.775631	1.791759	9.056029	2.109	8.486053
			-						
1982	9.521883	8.77774	0.95011	2.04122	7.724358	2.014903	9.275036	1.040277	8.613594
			-						
1983	9.231534	7.472103	1.17474	3.144152	8.40436	2.014903	9.364609	-0.40048	8.466068
			-						
1984	9.182147	8.350194	1.29902	3.678829	8.58401	2.251292	9.430514	0.239017	8.670343
			-						
1985	9.278588	7.820801	1.28518	1.704748	6.681231	2.251292	9.478101	1.625311	8.932793
			-						
1986	8.803651	5.486911	1.53479	1.686399	7.993958	2.251292	9.632168	1.321756	8.948573
			-						
1987	11.11099	10.99098	0.78023	2.322388	7.944882	2.639057	9.956222	2.366498	9.657983
			-						
1988	10.55346	10.40932	0.97154	3.64545	6.490572	2.674149	10.21561	2.091864	9.873513
			-						
1989	11.55985	11.57531	0.89233	3.71113	9.134895	2.797281	10.3223	2.61007	10.16563
			-						
1990	11.16346	10.972	0.54197	2.014903	9.532119	2.933857	10.42072	2.873565	10.49736
			-						
1991	10.4135	10.30358	0.39141	2.564949	8.569577	2.65956	10.62989	2.536075	10.55173
			-						
1992	12.32484	12.28216	0.42327	3.795489	10.16273	2.778819	10.97032	3.226844	10.87869
			-						
1993	11.45235	11.39505	0.57608	4.046554	10.18702	2.813011	11.75287	1.909543	11.82574

			-						
1994	11.45698	9.659414	0.89184	4.043051	9.099688	2.60269	11.87356	2.617396	11.40729
			-						
1995	13.72253	13.41212	0.12511	4.287716	10.51041	2.53449	12.10074	2.488234	11.75689
			-						
1996	11.81884	11.50837	0.36716	3.377588	11.04313	2.458734	12.38253	2.53449	11.73199
			-						
1997	12.53677	9.97059	0.29451	2.140066	10.57896	1.568616	12.66415	2.695978	11.97391
			-						
1998	13.06559	10.52097	0.53307	2.302585	4.862908	1.702928	12.77126	2.590767	12.09009
1999	16.78107	16.80846	-0.4427	1.88707	9.212009	1.673351	12.97425	2.941276	13.01625
			-						
2000	12.39731	13.1616	0.44691	1.931521	11.51309	1.665818	13.18134	2.523326	13.04245
			-						
2001	12.667	11.27603	0.38155	2.939162	10.63976	1.702928	13.54758	2.678965	13.26958
			-						
2002	13.60081	13.53658	0.75247	2.557227	11.76203	1.423108	13.74347	3.255786	13.45425
2003	14.05522	13.20936	-0.4961	2.639057	12.81318	1.413423	13.90767	2.938103	13.79969
			-						
2004	12.58897	12.92863	0.54905	2.70805	7.537057	1.432701	14.16734	2.776954	13.84769
			-						
2005	11.4869	14.60178	0.37179	2.884801	10.95937	1.342865	14.4244	2.573375	14.01739
			-						
2006	14.02227	14.6236	0.57608	2.104134	13.51925	1.144223	14.64433	2.381396	14.07031
			-						
2007	14.61895	9.9224	0.52492	1.686399	12.87412	1.266948	15.11534	2.385086	14.27879
			-						
2008	14.81814	11.03651	0.45918	2.451005	11.6732	1.043804	15.75	2.622492	14.56568
			-						
2009	12.86965	11.48515	0.61101	2.525729	13.81454	0.985817	16.02401	2.56341	14.6485
			-						
2010	16.03541	11.50695	0.57377	2.617396	13.77646	0.792993	16.13368	1.978239	15.01256
			-						
2011	16.24904	12.24041	0.42802	2.379546	12.17821	0.357674	16.18202	1.978239	14.93207

DATA ON MODEL 2, 3 AND 6 (WORLD BANK AND ERBE 1985)

YEARS	L^GDP	L^EXTDBT	L^DFI	L^CAB	L^RES
1970	8.57189	-0.22314	6.91095	3.912023	4.650144
1971	8.802507	1.252763	7.187506	5.435467	3.321432
1972	8.880099	4.467057	7.359531	5.776723	4.082609
1973	9.063058	2.424803	7.475169	3.964615	3.89995
1974	9.84284	3.817712	7.502242	8.025353	7.96259
1975	9.974656	3.314186	7.735215	3.751854	5.58912
1976	10.19076	3.206803	7.757479	5.554509	5.776103
1977	10.35839	2.251292	7.836528	6.473119	6.284134
1978	10.44988	6.787845	7.959695	7.777751	7.148267
1979	10.64482	5.884436	8.056141	6.91721	7.492259
1980	10.8124	5.542439	8.194257	7.764423	7.784224

1981	10.771	6.140746	8.231616	8.29365	8.013277
1982	10.80099	8.77774	8.590964	8.492798	7.243012
1983	10.88007	7.472103	8.691062	8.051309	5.500442
1984	10.99579	8.350194	8.766909	3.78646	5.89192
1985	11.12592	7.820801	8.825266	7.703188	6.209193
1986	11.14399	5.486911	9.139231	8.006068	7.573685
1987	11.56384	10.99098	9.2097	5.687992	6.962149
1988	11.84284	10.40932	9.336021	6.872853	7.223004
1989	12.28672	11.57531	9.296481	9.276512	9.228612
1990	12.49706	10.972	9.253026	10.70843	9.975622
1991	12.65121	10.30358	9.41275	9.445839	9.137393
1992	13.18555	12.28216	9.928799	10.5821	10.31749
1993	13.43552	11.39505	11.10926	9.87759	10.88281
1994	13.71	9.659414	11.16641	10.86483	10.51297
1995	14.47469	13.41212	11.69016	12.13396	9.197994
1996	14.80977	11.50837	11.71669	12.83741	11.80542
1997	14.84583	9.97059	11.76237	12.48103	11.38383
1998	14.81188	10.52097	11.93433	12.71117	10.47718
1999	14.97679	16.80846	11.94593	10.74368	12.67661
2000	15.33767	13.1616	11.96741	13.47727	13.20537
2001	15.3684	11.27603	11.99747	12.40041	11.42414
2002	15.74882	13.53658	12.02354	11.67025	12.03254
2003	15.95405	13.20936	12.09222	13.46533	10.85087
2004	16.25009	12.92863	12.42609	14.53643	13.97058
2005	16.49463	14.60178	12.5056	15.40306	14.16275
2006	16.73677	14.6236	12.62097	15.36266	14.39076
2007	16.84358	9.9224	12.80493	15.06208	13.35369
2008	17.00584	11.03651	12.89882	15.05405	15.49336
2009	17.02612	11.48515	12.99742	14.53722	12.01519
2010	17.34142	11.50695	16.02256	14.50515	13.69691
2011	17.44101	12.24041	16.17113	14.10578	10.95615

MORGAN GUARANTY TRUST 1986 APPROACH

YEARS	L^GDP	L^EXTDBT	L^DFI	L^CAB	L^RES	L^NEXTAS
1970	8.57189	-0.22314	6.91095	3.912023	4.650144	3.69883
1971	8.802507	1.252763	7.187506	5.435467	3.321432	4.93663
1972	8.880099	4.467057	7.359531	5.776723	4.082609	3.637586
1973	9.063058	2.424803	7.475169	3.964615	3.89995	5.156178
1974	9.84284	3.817712	7.502242	8.025353	7.96259	8.035765
1975	9.974656	3.314186	7.735215	3.751854	5.58912	3.706228
1976	10.19076	3.206803	7.757479	5.554509	5.776103	3.591818
1977	10.35839	2.251292	7.836528	6.473119	6.284134	6.10457
1978	10.44988	6.787845	7.959695	7.777751	7.148267	7.332631

1979	10.64482	5.884436	8.056141	6.91721	7.492259	7.620362
1980	10.8124	5.542439	8.194257	7.764423	7.784224	7.778965
1981	10.771	6.140746	8.231616	8.29365	8.013277	8.018625
1982	10.80099	8.77774	8.590964	8.492798	7.243012	7.436558
1983	10.88007	7.472103	8.691062	8.051309	5.500442	5.957649
1984	10.99579	8.350194	8.766909	3.78646	5.89192	6.412311
1985	11.12592	7.820801	8.825266	7.703188	6.209193	5.729125
1986	11.14399	5.486911	9.139231	8.006068	7.573685	8.281319
1987	11.56384	10.99098	9.2097	5.687992	6.962149	7.418961
1988	11.84284	10.40932	9.336021	6.872853	7.223004	8.664216
1989	12.28672	11.57531	9.296481	9.276512	9.228612	9.475155
1990	12.49706	10.972	9.253026	10.70843	9.975622	9.970473
1991	12.65121	10.30358	9.41275	9.445839	9.137393	9.403882
1992	13.18555	12.28216	9.928799	10.5821	10.31749	9.916749
1993	13.43552	11.39505	11.10926	9.87759	10.88281	10.2321
1994	13.71	9.659414	11.16641	10.86483	10.51297	8.900931
1995	14.47469	13.41212	11.69016	12.13396	9.197994	10.86748
1996	14.80977	11.50837	11.71669	12.83741	11.80542	11.77001
1997	14.84583	9.97059	11.76237	12.48103	11.38383	8.284706
1998	14.81188	10.52097	11.93433	12.71117	10.47718	9.474695
1999	14.97679	16.80846	11.94593	10.74368	12.67661	12.94617
2000	15.33767	13.1616	11.96741	13.47727	13.20537	13.31322
2001	15.3684	11.27603	11.99747	12.40041	11.42414	11.23239
2002	15.74882	13.53658	12.02354	11.67025	12.03254	11.08735
2003	15.95405	13.20936	12.09222	13.46533	10.85087	11.57137
2004	16.25009	12.92863	12.42609	14.53643	13.97058	14.04379
2005	16.49463	14.60178	12.5056	15.40306	14.16275	14.18969
2006	16.73677	14.6236	12.62097	15.36266	14.39076	14.60823
2007	16.84358	9.9224	12.80493	15.06208	13.35369	13.77328
2008	17.00584	11.03651	12.89882	15.05405	15.49336	14.06543
2009	17.02612	11.48515	12.99742	14.53722	12.01519	14.52988
2010	17.34142	11.50695	16.02256	14.50515	13.69691	13.89866
2011	17.44101	12.24041	16.17113	14.10578	10.95615	13.35673

Sources: Central Bank of Nigerian Statistical Annual Reports, World Bank Statistical Data, Federal Reserve Bank of England Statistical Reports.

APPENDIX A2

RESULT OF ORDINARY LEAST SQUARE REGRESSION ANALYSIS FOR MODEL 1A

MODEL 1A WORLD BANK & ERBE ESTIMATES

OLS RESULT

Dependent Variable: KFW

Method: Least Squares

Date: 02/18/14 Time: 07:55

Sample: 1970 2011

Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.751495	1.331878	2.065876	0.0468
EXTDEBT	0.261618	0.068995	3.791814	0.0006
DOP	0.251213	0.543344	0.462346	0.6469
INF	-0.067741	0.183133	-0.369903	0.7138
GCF	-0.054248	0.078343	-0.692447	0.4935
DR	-0.302774	0.295255	-1.025468	0.3126
PRIVCR	0.089382	0.279642	0.319630	0.7513
USIRD	-0.001360	0.184872	-0.007358	0.9942
GOCE	0.610640	0.351431	1.737584	0.0916
R-squared	0.955795	Mean dependent var		11.26291
Adjusted R-squared	0.945078	S.D. dependent var		2.891991
S.E. of regression	0.677750	Akaike info criterion		2.247333
Sum squared resid	15.15839	Schwarz criterion		2.619691
Log likelihood	-38.19400	F-statistic		89.18940
Durbin-Watson stat	1.594042	Prob(F-statistic)		0.000000

ECM FOR MODEL 1A

Last updated:

02/18/14 -

07:56

Modified:

1970 2011 //

makeresid

0.766864

0.711571

-0.149963

0.312242

-0.110157

-0.198573

-0.327614

0.003713

-0.327828

-0.773761

-0.704728

-0.337829

-0.090259

0.129152

-0.107334

-0.307901

0.373976

0.307794

-0.067142

0.588692

0.146821

-0.570676
 0.583264
 -0.467660
 0.009280
 0.920142
 0.122779
 0.018677
 0.137430
 1.795069
 -0.311944
 -0.743292
 -0.622705
 -0.311250
 -0.434706
 -0.872456
 -1.312792
 0.889854
 -0.525551
 -0.053556
 1.087310
 0.825047

CORRELATION MATRIX FOR MODEL 1A

	KFW	EXDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
KFW	1.000000	0.962089	0.858913	0.651649	-0.009246	0.813945	-0.118890	0.996726	0.730886
EXDEBT	0.962089	1.000000	0.896486	0.691851	-0.005334	0.766864	-0.093525	0.954148	0.743714
DOP	0.858913	0.896486	1.000000	0.641894	0.109877	0.666188	0.225490	0.838196	0.786178
INF	0.651649	0.691851	0.641894	1.000000	0.131165	0.569651	-0.043300	0.648665	0.637374
GCF	-0.009246	-0.005334	0.109877	0.131165	1.000000	0.061521	0.445689	-0.007461	-0.000980
DR	0.813945	0.766864	0.666188	0.569651	0.061521	1.000000	-0.170414	0.822547	0.540683
PRIVCR	-0.118890	-0.093525	0.225490	-0.043300	0.445689	-0.170414	1.000000	-0.155774	0.250498
USIRD	0.996726	0.954148	0.838196	0.648665	-0.007461	0.822547	-0.155774	1.000000	0.708262
GOCE	0.730886	0.743714	0.786178	0.637374	-0.000980	0.540683	0.250498	0.708262	1.000000

UNIT ROOT TEST FOR MODEL 1A

KFW @ LEVEL

ADF Test Statistic	-0.495567	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(KFW)

Method: Least Squares

Date: 02/18/14 Time: 07:57

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KFW(-1)	-0.030058	0.060653	-0.495567	0.6231
D(KFW(-1))	-0.371270	0.154854	-2.397548	0.0217
C	0.648582	0.693985	0.934575	0.3561
R-squared	0.156762	Mean dependent var		0.224282
Adjusted R-squared	0.111181	S.D. dependent var		1.082166
S.E. of regression	1.020236	Akaike info criterion		2.949983
Sum squared resid	38.51260	Schwarz criterion		3.076649
Log likelihood	-55.99966	F-statistic		3.439237
Durbin-Watson stat	2.301253	Prob(F-statistic)		0.042666

KFW @ 1ST DIFF

ADF Test Statistic	-7.876181	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(KFW,2)

Method: Least Squares

Date: 02/18/14 Time: 09:12

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KFW(-1))	-1.997773	0.253647	-7.876181	0.0000
D(KFW(-1),2)	0.438767	0.153154	2.864867	0.0069
C	0.438804	0.159427	2.752384	0.0092
R-squared	0.751240	Mean dependent var	-0.001876	
Adjusted R-squared	0.737420	S.D. dependent var	1.827269	
S.E. of regression	0.936339	Akaike info criterion	2.780125	
Sum squared resid	31.56231	Schwarz criterion	2.908092	
Log likelihood	-51.21244	F-statistic	54.35898	
Durbin-Watson stat	2.270130	Prob(F-statistic)	0.000000	

EXTDEBT @ LEVEL

ADF Test Statistic	-2.201592	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT)

Method: Least Squares

Date: 02/18/14 Time: 09:14

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTDEBT(-1)	-0.188125	0.085450	-2.201592	0.0340
D(EXTDEBT(-1))	-0.299084	0.146248	-2.045049	0.0480
C	2.103002	0.848483	2.478544	0.0179
R-squared	0.228160	Mean dependent var	0.274691	
Adjusted R-squared	0.186439	S.D. dependent var	2.270709	
S.E. of regression	2.048126	Akaike info criterion	4.343766	
Sum squared resid	155.2083	Schwarz criterion	4.470432	
Log likelihood	-83.87531	F-statistic	5.468688	
Durbin-Watson stat	2.246333	Prob(F-statistic)	0.008303	

EXTDEBT @ 1ST DIFF

ADF Test Statistic	-8.348753	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT,2)

Method: Least Squares

Date: 02/18/14 Time: 09:14

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT(-1))	-1.969770	0.235936	-8.348753	0.0000
D(EXTDEBT(-1),2)	0.437732	0.143023	3.060567	0.0042
C	0.470617	0.311519	1.510716	0.1396
R-squared	0.760957	Mean dependent var	-0.063611	
Adjusted R-squared	0.747677	S.D. dependent var	3.783674	
S.E. of regression	1.900607	Akaike info criterion	4.196027	
Sum squared resid	130.0430	Schwarz criterion	4.323993	
Log likelihood	-78.82252	F-statistic	57.30026	
Durbin-Watson stat	2.172098	Prob(F-statistic)	0.000000	

DOP @ LEVEL

ADF Test Statistic	-1.860631	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DOP)

Method: Least Squares

Date: 02/18/14 Time: 09:15

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DOP(-1)	-0.223312	0.120020	-1.860631	0.0708
D(DOP(-1))	-0.288539	0.154958	-1.862047	0.0706
C	-0.141315	0.093570	-1.510253	0.1395
R-squared	0.225577	Mean dependent var	0.015071	
Adjusted R-squared	0.183716	S.D. dependent var	0.237482	
S.E. of regression	0.214561	Akaike info criterion	-0.168407	
Sum squared resid	1.703348	Schwarz criterion	-0.041741	
Log likelihood	6.368137	F-statistic	5.388750	
Durbin-Watson stat	1.975173	Prob(F-statistic)	0.008833	

DOP @ 1ST DIFF

ADF Test Statistic	-5.323674	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DOP,2)

Method: Least Squares

Date: 02/18/14 Time: 09:16

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DOP(-1))	-1.483596	0.278679	-5.323674	0.0000
D(DOP(-1),2)	0.066946	0.166600	0.401841	0.6902
C	0.022731	0.036518	0.622461	0.5376
R-squared	0.695038	Mean dependent var		0.005171
Adjusted R-squared	0.678096	S.D. dependent var		0.399967
S.E. of regression	0.226928	Akaike info criterion		-0.054568
Sum squared resid	1.853861	Schwarz criterion		0.073398
Log likelihood	4.064074	F-statistic		41.02378
Durbin-Watson stat	1.994631	Prob(F-statistic)		0.000000

INF @ LEVEL

ADF Test Statistic	-4.342622	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INF)

Method: Least Squares

Date: 02/18/14 Time: 09:17

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.717441	0.165209	-4.342622	0.0001
D(INF(-1))	0.300114	0.157124	1.910050	0.0639
C	1.919745	0.456300	4.207203	0.0002
R-squared	0.339884	Mean dependent var		-0.009826
Adjusted R-squared	0.304202	S.D. dependent var		0.787047
S.E. of regression	0.656511	Akaike info criterion		2.068285
Sum squared resid	15.94726	Schwarz criterion		2.194951
Log likelihood	-38.36570	F-statistic		9.525368
Durbin-Watson stat	1.747053	Prob(F-statistic)		0.000460

GCF @ LEVEL

ADF Test Statistic	-1.946810	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GCF)

Method: Least Squares

Date: 02/18/14 Time: 09:18

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GCF(-1)	-0.269803	0.138587	-1.946810	0.0592
D(GCF(-1))	-0.232948	0.164877	-1.412857	0.1661
C	2.655797	1.285416	2.066099	0.0459
R-squared	0.221706	Mean dependent var		0.147875
Adjusted R-squared	0.179636	S.D. dependent var		2.036369
S.E. of regression	1.844419	Akaike info criterion		4.134244
Sum squared resid	125.8696	Schwarz criterion		4.260910
Log likelihood	-79.68489	F-statistic		5.269946
Durbin-Watson stat	2.202112	Prob(F-statistic)		0.009686

GCF @ 1ST DIFF

ADF Test Statistic	-8.681226	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GCF,2)

Method: Least Squares

Date: 02/18/14 Time: 09:18

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GCF(-1))	-2.094698	0.241291	-8.681226	0.0000
D(GCF(-1),2)	0.515979	0.145079	3.556549	0.0011
C	0.368647	0.274213	1.344382	0.1872
R-squared	0.767533	Mean dependent var		-0.035172
Adjusted R-squared	0.754618	S.D. dependent var		3.406828
S.E. of regression	1.687607	Akaike info criterion		3.958304
Sum squared resid	102.5286	Schwarz criterion		4.086270
Log likelihood	-74.18692	F-statistic		59.43037
Durbin-Watson stat	2.151887	Prob(F-statistic)		0.000000

DR @ LEVEL

ADF Test Statistic	-0.130389	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DR)

Method: Least Squares

Date: 02/18/14 Time: 09:19

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DR(-1)	-0.007641	0.058602	-0.130389	0.8970
D(DR(-1))	-0.004865	0.177302	-0.027439	0.9783
C	-0.004770	0.111717	-0.042701	0.9662
R-squared	0.000548	Mean dependent var	-0.018523	
Adjusted R-squared	-0.053477	S.D. dependent var	0.216159	
S.E. of regression	0.221863	Akaike info criterion	-0.101474	
Sum squared resid	1.821261	Schwarz criterion	0.025192	
Log likelihood	5.029470	F-statistic	0.010141	
Durbin-Watson stat	1.899040	Prob(F-statistic)	0.989913	

DR @ 1ST DIFF

ADF Test Statistic	-3.190340	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DR,2)

Method: Least Squares

Date: 02/18/14 Time: 09:20

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DR(-1))	-0.806885	0.252915	-3.190340	0.0029
D(DR(-1),2)	-0.191969	0.174746	-1.098560	0.2793
C	-0.018434	0.035463	-0.519816	0.6064
R-squared	0.496223	Mean dependent var	-0.011162	
Adjusted R-squared	0.468235	S.D. dependent var	0.303440	
S.E. of regression	0.221275	Akaike info criterion	-0.105018	
Sum squared resid	1.762653	Schwarz criterion	0.022948	
Log likelihood	5.047859	F-statistic	17.73009	
Durbin-Watson stat	2.041937	Prob(F-statistic)	0.000004	

PRIVCR @ LEVEL

ADF Test Statistic	0.040245	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PRIVCR)

Method: Least Squares

Date: 02/18/14 Time: 09:21

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIVCR(-1)	0.000336	0.008351	0.040245	0.9681
D(PRIVCR(-1))	0.272232	0.160607	1.695022	0.0985
C	0.173772	0.099598	1.744734	0.0893
R-squared	0.073141	Mean dependent var		0.247245
Adjusted R-squared	0.023041	S.D. dependent var		0.150179
S.E. of regression	0.148439	Akaike info criterion		-0.905253
Sum squared resid	0.815258	Schwarz criterion		-0.778587
Log likelihood	21.10505	F-statistic		1.459894
Durbin-Watson stat	1.783412	Prob(F-statistic)		0.245329

PRIVCR @ 1ST DIFF

ADF Test Statistic	-4.499841	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PRIVCR,2)

Method: Least Squares

Date: 02/18/14 Time: 09:22

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PRIVCR(-1))	-0.900015	0.200010	-4.499841	0.0001
D(PRIVCR(-1),2)	0.254510	0.162636	1.564904	0.1264
C	0.225511	0.056241	4.009717	0.0003
R-squared	0.385114	Mean dependent var		-0.003566
Adjusted R-squared	0.350954	S.D. dependent var		0.179531
S.E. of regression	0.144636	Akaike info criterion		-0.955388
Sum squared resid	0.753106	Schwarz criterion		-0.827422
Log likelihood	21.63007	F-statistic		11.27373
Durbin-Watson stat	2.068040	Prob(F-statistic)		0.000158

USIRD @ LEVEL

ADF Test Statistic	-2.056420	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INTDIFF)

Method: Least Squares

Date: 02/18/14 Time: 09:23

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
USIRD(-1)	-0.214803	0.104455	-2.056420	0.0468
D(USIRD(-1))	0.024122	0.150434	0.160350	0.8735
C	0.408726	0.220226	1.855942	0.0714
R-squared	0.106492	Mean dependent var		0.013283
Adjusted R-squared	0.058195	S.D. dependent var		0.717416
S.E. of regression	0.696229	Akaike info criterion		2.185761
Sum squared resid	17.93517	Schwarz criterion		2.312427
Log likelihood	-40.71522	F-statistic		2.204913
Durbin-Watson stat	1.981879	Prob(F-statistic)		0.124543

USIRD @ 1ST DIFF

ADF Test Statistic	-6.618476	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(USIRD,2)

Method: Least Squares

Date: 02/18/14 Time: 09:24

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(USIRD(-1))	-1.451133	0.219255	-6.618476	0.0000
D(USIRD(-1),2)	0.345164	0.145286	2.375763	0.0230
C	0.037631	0.111333	0.338003	0.7373
R-squared	0.603046	Mean dependent var		-0.003280
Adjusted R-squared	0.580993	S.D. dependent var		1.068634
S.E. of regression	0.691735	Akaike info criterion		2.174575
Sum squared resid	17.22589	Schwarz criterion		2.302541
Log likelihood	-39.40422	F-statistic		27.34533
Durbin-Watson stat	2.179585	Prob(F-statistic)		0.000000

GOCE @ LEVEL

ADF Test Statistic	-0.132702	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GOCE)

Method: Least Squares

Date: 02/18/14 Time: 09:24

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOCE(-1)	-0.002265	0.017068	-0.132702	0.8951
D(GOCE(-1))	-0.254094	0.162203	-1.566516	0.1257
C	0.283316	0.187148	1.513859	0.1386
R-squared	0.064482	Mean dependent var		0.205460
Adjusted R-squared	0.013913	S.D. dependent var		0.274665
S.E. of regression	0.272748	Akaike info criterion		0.311499
Sum squared resid	2.752476	Schwarz criterion		0.438165
Log likelihood	-3.229971	F-statistic		1.275133
Durbin-Watson stat	2.003245	Prob(F-statistic)		0.291386

GOCE @ 1ST DIFF

ADF Test Statistic	-4.950671	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GOCE,2)

Method: Least Squares

Date: 02/18/14 Time: 09:25

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GOCE(-1))	-1.316237	0.265870	-4.950671	0.0000
D(GOCE(-1),2)	0.047762	0.168966	0.282673	0.7790
C	0.272456	0.071217	3.825743	0.0005
R-squared	0.622064	Mean dependent var		-0.007353
Adjusted R-squared	0.601068	S.D. dependent var		0.437379
S.E. of regression	0.276254	Akaike info criterion		0.338808
Sum squared resid	2.747377	Schwarz criterion		0.466775
Log likelihood	-3.606761	F-statistic		29.62711
Durbin-Watson stat	1.972369	Prob(F-statistic)		0.000000

ECM @ LEVEL

ADF Test Statistic	-4.046095	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM)

Method: Least Squares

Date: 02/18/14 Time: 09:26

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.901228	0.222740	-4.046095	0.0003
D(ECM(-1))	0.038219	0.168739	0.226500	0.8221
C	-0.033336	0.096873	-0.344121	0.7327
R-squared	0.431039	Mean dependent var		0.002837
Adjusted R-squared	0.400284	S.D. dependent var		0.787071
S.E. of regression	0.609518	Akaike info criterion		1.919743
Sum squared resid	13.74596	Schwarz criterion		2.046409
Log likelihood	-35.39485	F-statistic		14.01539
Durbin-Watson stat	1.928114	Prob(F-statistic)		0.000029

OVER PARAMETIZED ECM FOR MODEL 1A

Dependent Variable: D(KFW,2)

Method: Least Squares

Date: 02/18/14 Time: 09:40

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KFW(-1),2)	-0.401921	0.118523	-3.391070	0.0026
D(EXTDEBT,2)	0.272752	0.058101	4.694472	0.0001
D(EXTDEBT(-1),2)	0.079978	0.062270	1.284386	0.2124
D(DOP,2)	-0.346061	0.577219	-0.599531	0.5549
D(DOP(-1),2)	-0.987925	0.580502	-1.701846	0.1029
D(INF(-1),2)	0.051490	0.199526	0.258060	0.7988
D(GCF,2)	-0.049846	0.049644	-1.004051	0.3263
D(GCF(-1),2)	-0.056301	0.048570	-1.159168	0.2588
D(DR,2)	0.802085	0.678762	1.181687	0.2499
D(DR(-1),2)	0.729211	0.684285	1.065654	0.2981
D(PRIVCR,2)	-1.061348	0.932176	-1.138570	0.2671
D(PRIVCR(-1),2)	-2.233268	1.046025	-2.135005	0.0441
D(USIRD,2)	-0.037951	0.160513	-0.236437	0.8153
D(INTDIFF(-1),2)	0.135223	0.148195	0.912467	0.3714
D(GOCE,2)	0.426412	0.619047	0.688819	0.4981
D(GOCE(-1),2)	0.437816	0.559938	0.781900	0.4426
ECM(-1)	-1.135099	0.246117	-4.612031	0.0001
R-squared	0.915781	Mean dependent var		-0.001876
Adjusted R-squared	0.854532	S.D. dependent var		1.827269
S.E. of regression	0.696927	Akaike info criterion		2.415002
Sum squared resid	10.68555	Schwarz criterion		3.140145
Log likelihood	-30.09255	Durbin-Watson stat		1.645959

PASSIMONIOUS ECM FOR MODEL 1A

Dependent Variable: D(KFW,2)

Method: Least Squares

Date: 02/18/14 Time: 09:45

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT,2)	0.208801	0.047477	4.397968	0.0001
D(DOP(-1),2)	-0.601640	0.407675	-1.475782	0.1504
D(INF,2)	-0.194608	0.139838	-1.391667	0.1743
D(GCF(-1),2)	-0.077298	0.049736	-1.554171	0.1306
D(DR,2)	0.441408	0.493481	0.894479	0.3782
D(PRIVCR(-1),2)	-1.057323	0.877283	-1.205225	0.2375
D(URSIRD(-1),2)	-0.072382	0.134363	-0.538704	0.5941
D(GOCE(-1),2)	-0.565986	0.488688	-1.158177	0.2559
ECM(-1)	-1.422630	0.247771	-5.741712	0.0000
R-squared	0.851474	Mean dependent var		-0.001876
Adjusted R-squared	0.811867	S.D. dependent var		1.827269
S.E. of regression	0.792565	Akaike info criterion		2.572089
Sum squared resid	18.84476	Schwarz criterion		2.955988
Log likelihood	-41.15573	Durbin-Watson stat		1.772730

JOHASEN TEST FOR MODEL 1A

Date: 02/18/14 Time: 09:47

Sample: 1970 2011

Included observations: 40

Test

assumption:

Linear

deterministic

trend in the

data

Series: KFW EXTDEBT DOP INF GCF DR PRIVCR USIRD GOCE

Lags interval: 1 to 1

	Likelihood	5 Percent	1 Percent	Hypothesized
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)
0.935807	320.0949	192.89	204.95	None **
0.797808	210.2607	156.00	168.36	At most 1 **
0.662013	146.3192	124.24	133.57	At most 2 **
0.578695	102.9292	94.15	103.18	At most 3 *
0.506735	68.35335	68.52	76.07	At most 4
0.378693	40.08503	47.21	54.46	At most 5
0.317649	21.04781	29.68	35.65	At most 6
0.131239	5.759381	15.41	20.04	At most 7
0.003292	0.131915	3.76	6.65	At most 8

*(**)

denotes

rejection of

the

hypothesis at

5%(1%)

significance

level

L.R. test

indicates 4

cointegrating
equation(s)
at 5%
significance
level

Unnormalized Cointegrating Coefficients:

KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
-0.056982	-0.128792	0.009409	-0.052790	-0.118574	0.238852	0.024890	0.133057	0.248441
0.092964	-0.027765	-0.395785	0.385850	-0.013260	-0.334578	0.067513	0.222726	-0.162944
-0.008392	-0.096631	0.646499	-0.103429	0.091364	0.278965	-0.107511	-0.014277	0.201019
-0.201595	0.008584	-0.250619	0.003787	0.086628	-0.059388	0.095439	0.155499	-0.021419
-0.252534	0.016211	0.292949	0.050268	-0.118657	0.109752	0.222889	-0.167187	0.124272
-0.064686	0.081174	0.472051	0.078383	-0.038828	-0.407542	0.339601	0.195444	-0.498531
0.199873	-0.089638	0.024613	-0.006116	-0.004327	0.148127	0.345028	-0.014424	-0.448508
-0.066549	0.081007	-0.563476	-0.018541	-0.015199	-0.123148	-0.018443	0.090601	0.045248
0.024144	-0.010642	-0.098713	-0.021451	-0.003951	-0.207841	0.012762	-0.033765	0.008080

Normalized
Cointegratin
g
Coefficients:
1
Cointegratin
g
Equation(s)

KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	2.260204 (0.73588)	-0.165123 (0.81570)	0.926431 (0.38151)	2.080895 (0.59936)	-4.191684 (1.33736)	-0.436799 (0.41330)	-2.335059 (0.75457)	-4.359956 (1.19669)
Log likelihood	-128.7814							

Normalized
Cointegratin
g
Coefficients:
2
Cointegratin
g
Equation(s)

KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.000000	-3.779758 (1.49759)	3.774221 (1.26391)	0.116889 (0.20313)	-3.668187 (1.23076)	0.590484 (0.49502)	1.843646 (0.79550)	-2.057072 (0.61519)
0.000000	1.000000	1.599252 (0.86367)	-1.259970 (0.72890)	0.868951 (0.11714)	-0.231615 (0.70979)	-0.454509 (0.28548)	-1.848818 (0.45877)	-1.018883 (0.35478)
Log likelihood	-96.81063							

Normalized
Cointegratin
g
Coefficients:
3
Cointegratin
g
Equation(s)

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KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.000000	0.000000	2.823482 (1.10768)	0.983138 (0.36599)	-2.558793 (1.03255)	-0.129169 (0.54613)	0.971764 (0.61546)	-1.637981 (0.65386)
0.000000	1.000000	0.000000	-0.857704 (0.54862)	0.502433 (0.18127)	-0.701010 (0.51140)	-0.150017 (0.27049)	-1.479916 (0.30483)	-1.196205 (0.32385)
0.000000	0.000000	1.000000	-0.251534 (0.19794)	0.229181 (0.06540)	0.293509 (0.18451)	-0.190397 (0.09759)	-0.230671 (0.10998)	0.110878 (0.11684)
Log likelihood	-75.11567							
Normalized Cointegratin g Coefficients: 4 Cointegratin g Equation(s)								
KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.000000	0.000000	0.000000	-0.861388 (0.55864)	0.146476 (0.30667)	-0.254541 (0.48721)	-0.699992 (0.32488)	0.073495 (0.57621)
0.000000	1.000000	0.000000	0.000000	1.062754 (0.27887)	-1.522804 (0.15309)	-0.111932 (0.24321)	-0.972078 (0.16218)	-1.716109 (0.28764)
0.000000	0.000000	1.000000	0.000000	0.393503 (0.16992)	0.052506 (0.09328)	-0.179228 (0.14820)	-0.081740 (0.09882)	-0.041592 (0.17527)
0.000000	0.000000	0.000000	1.000000	0.653281 (0.33127)	-0.958132 (0.18186)	0.044403 (0.28891)	0.592090 (0.19266)	-0.606158 (0.34169)
Log likelihood	-57.82772							
Normalized Cointegratin g Coefficients: 5 Cointegratin g Equation(s)								
KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.000000	0.000000	0.000000	0.000000	-0.204259 (0.20355)	-0.616414 (0.25029)	-0.126311 (0.23282)	-0.292864 (0.31865)
0.000000	1.000000	0.000000	0.000000	0.000000	-1.090077 (0.25994)	0.334536 (0.31963)	-1.679868 (0.29732)	-1.264106 (0.40693)
0.000000	0.000000	1.000000	0.000000	0.000000	0.212731 (0.08967)	-0.013915 (0.11025)	-0.343812 (0.10256)	0.125770 (0.14037)
0.000000	0.000000	0.000000	1.000000	0.000000	-0.692133 (0.14014)	0.318850 (0.17232)	0.157008 (0.16029)	-0.328309 (0.21938)
0.000000	0.000000	0.000000	0.000000	1.000000	-0.407175 (0.28475)	-0.420105 (0.35013)	0.665996 (0.32570)	-0.425312 (0.44576)
Log likelihood	-43.69356							
Normalized Cointegratin g Coefficients:								

6
Cointegratin
g
Equation(s)

KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.739638 (0.25252)	-0.385093 (0.16238)	-0.051941 (0.30182)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	-0.323074 (0.59539)	-3.060920 (0.38285)	0.021636 (0.71163)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.114419 (0.09432)	-0.074296 (0.06065)	-0.125145 (0.11274)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-0.098693 (0.35577)	-0.719876 (0.22877)	0.488059 (0.42523)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	-0.665741 (0.32121)	0.150133 (0.20655)	0.054949 (0.38392)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	-0.603269 (0.35795)	-1.266931 (0.23017)	1.179496 (0.42783)
Log likelihood		-34.17495						

Normalized
Cointegratin
g
Coefficients:
7
Cointegratin
g
Equation(s)

KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	URIRD	GOCE
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.420367 (0.16577)	-0.869519 (0.07401)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-3.076328 (0.38849)	-0.335482 (0.17344)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	-0.068840 (0.06402)	0.001331 (0.02858)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	-0.724583 (0.23013)	0.378966 (0.10274)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.118384 (0.23459)	-0.680946 (0.10473)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	-1.295701 (0.24341)	0.512656 (0.10867)
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	-0.047691 (0.16701)	-1.105377 (0.07456)
Log likelihood		-26.53073						

Normalized
Cointegratin
g
Coefficients:
8
Cointegratin
g
Equation(s)

KFW	EXTDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.641641 (0.62488)

0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.332172 (4.35143)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.038649 (0.12373)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.771757 (1.05829)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	-0.745121 (0.27408)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	1.215046 (1.84662)
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	-1.079524 (0.17250)
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.542093 (1.41245)

Log
likelihood -23.71700

APPENDIX A3 RESULT OF ANALYSES FOR MODEL 1B MORGAN GUARANTY TRUST (1986) ESTIMATES

OLS RESULT FOR MODEL 1B

Dependent Variable: KFM
Method: Least Squares
Date: 02/18/14 Time: 13:24
Sample: 1970 2011
Included observations: 41
Excluded observations: 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.709477	2.183927	0.782754	0.4395
EXTDEBT	0.230579	0.114668	2.010835	0.0528
DOP	-0.059823	0.890980	-0.067143	0.9469
INF	-0.084413	0.303162	-0.278443	0.7825
GCF	-0.023812	0.128507	-0.185293	0.8542
DR	-0.134784	0.485097	-0.277849	0.7829
PRIVCR	-0.042269	0.468172	-0.090286	0.9286
USIRD	0.008644	0.306105	0.028238	0.9776
GOCE	0.764468	0.585399	1.305894	0.2009
R-squared	0.881447	Mean dependent var		10.98126
Adjusted R-squared	0.851809	S.D. dependent var		2.885465
S.E. of regression	1.110778	Akaike info criterion		3.239186
Sum squared resid	39.48248	Schwarz criterion		3.615336
Log likelihood	-57.40332	F-statistic		29.74016
Durbin-Watson stat	1.482398	Prob(F-statistic)		0.000000

ECM

Last updated:
02/18/14 -
13:24
Modified:
1970 2011 //
makesresid

0.829823
0.828432
0.096612
0.518786
-0.469318

0.000310
 NA
 0.053341
 -0.304027
 -1.784745
 -1.312379
 -0.879424
 0.157653
 0.393231
 0.056308
 -0.146909
 -0.071850
 0.578633
 0.074131
 0.678237
 0.074883
 -0.555210
 0.814354
 -0.515877
 0.134409
 1.369040
 -0.153966
 0.512967
 0.712941
 2.346089
 -1.147171
 -0.529015
 -0.319751
 0.001695
 -1.544539
 -3.054603
 -0.597696
 0.912463
 0.670016
 -1.392749
 1.482437
 1.482438

CORRELATION MATRIX FOR MODEL 1B

KFM	EXDEBT	DOP	INF	GCF	DR	PRIVCR	USIRD	GOCE
1.000000	0.861568	0.657842	0.014818	0.740678	-0.087726	0.915322	0.719935	0.926018
0.861568	1.000000	0.649789	0.132065	0.663510	0.211684	0.832532	0.789665	0.843810
0.657842	0.649789	1.000000	0.135152	0.568821	-0.047294	0.652047	0.636693	0.695295
0.014818	0.132065	0.135152	1.000000	0.070470	0.456139	0.006982	0.006236	0.014569
0.740678	0.663510	0.568821	0.070470	1.000000	-0.181267	0.821569	0.536487	0.817219
-0.087726	0.211684	-0.047294	0.456139	-0.181267	1.000000	-0.174955	0.244543	-0.180289
0.915322	0.832532	0.652047	0.006982	0.821569	-0.174955	1.000000	0.706453	0.990481
0.719935	0.789665	0.636693	0.006236	0.536487	0.244543	0.706453	1.000000	0.725159
0.926018	0.843810	0.695295	0.014569	0.817219	-0.180289	0.990481	0.725159	1.000000

UNIT ROOT TEST FOR MODEL 1B

KFM @ LEVEL

ADF Test Statistic	-0.681736	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(KFM)

Method: Least Squares

Date: 02/18/14 Time: 13:29

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KFM(-1)	-0.056834	0.083366	-0.681736	0.4997
D(KFM(-1))	-0.387316	0.155722	-2.487235	0.0175
C	0.932545	0.921857	1.011594	0.3183
R-squared	0.186549	Mean dependent var		0.225323
Adjusted R-squared	0.142579	S.D. dependent var		1.479610
S.E. of regression	1.370074	Akaike info criterion		3.539646
Sum squared resid	69.45285	Schwarz criterion		3.666312
Log likelihood	-67.79291	F-statistic		4.242624
Durbin-Watson stat	2.231421	Prob(F-statistic)		0.021934

KFM @ 1ST DIFF

ADF Test Statistic	-7.244402	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(KFM,2)

Method: Least Squares

Date: 02/18/14 Time: 13:30

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KFM(-1))	-1.982445	0.273652	-7.244402	0.0000
D(KFM(-1),2)	0.396060	0.165435	2.394051	0.0220
C	0.417101	0.214262	1.946682	0.0594
R-squared	0.749930	Mean dependent var		-0.002338
Adjusted R-squared	0.736038	S.D. dependent var		2.526219
S.E. of regression	1.297902	Akaike info criterion		3.433179
Sum squared resid	60.64383	Schwarz criterion		3.561146
Log likelihood	-63.94700	F-statistic		53.97994
Durbin-Watson stat	2.327095	Prob(F-statistic)		0.000000

EXTDEBT @ LEVEL

ADF Test Statistic	-2.201592	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT)

Method: Least Squares

Date: 02/18/14 Time: 13:31

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTDEBT(-1)	-0.188125	0.085450	-2.201592	0.0340
D(EXTDEBT(-1))	-0.299084	0.146248	-2.045049	0.0480
C	2.103002	0.848483	2.478544	0.0179
R-squared	0.228160	Mean dependent var		0.274691
Adjusted R-squared	0.186439	S.D. dependent var		2.270709
S.E. of regression	2.048126	Akaike info criterion		4.343766
Sum squared resid	155.2083	Schwarz criterion		4.470432
Log likelihood	-83.87531	F-statistic		5.468688
Durbin-Watson stat	2.246333	Prob(F-statistic)		0.008303

EXTDEBT @ 1ST DIFF

ADF Test Statistic	-8.348753	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT,2)

Method: Least Squares

Date: 02/18/14 Time: 13:32

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT(-1))	-1.969770	0.235936	-8.348753	0.0000
D(EXTDEBT(-1),2)	0.437732	0.143023	3.060567	0.0042
C	0.470617	0.311519	1.510716	0.1396
R-squared	0.760957	Mean dependent var		-0.063611
Adjusted R-squared	0.747677	S.D. dependent var		3.783674
S.E. of regression	1.900607	Akaike info criterion		4.196027
Sum squared resid	130.0430	Schwarz criterion		4.323993
Log likelihood	-78.82252	F-statistic		57.30026
Durbin-Watson stat	2.172098	Prob(F-statistic)		0.000000

DOP @ LEVEL

ADF Test Statistic	-1.860631	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DOP)

Method: Least Squares

Date: 02/18/14 Time: 13:33

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DOP(-1)	-0.223312	0.120020	-1.860631	0.0708
D(DOP(-1))	-0.288539	0.154958	-1.862047	0.0706
C	-0.141315	0.093570	-1.510253	0.1395
R-squared	0.225577	Mean dependent var		0.015071
Adjusted R-squared	0.183716	S.D. dependent var		0.237482
S.E. of regression	0.214561	Akaike info criterion		-0.168407
Sum squared resid	1.703348	Schwarz criterion		-0.041741
Log likelihood	6.368137	F-statistic		5.388750
Durbin-Watson stat	1.975173	Prob(F-statistic)		0.008833

DOP @ 1ST DIFF

ADF Test Statistic	-5.323674	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DOP,2)

Method: Least Squares

Date: 02/18/14 Time: 13:34

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DOP(-1))	-1.483596	0.278679	-5.323674	0.0000
D(DOP(-1),2)	0.066946	0.166600	0.401841	0.6902
C	0.022731	0.036518	0.622461	0.5376
R-squared	0.695038	Mean dependent var		0.005171
Adjusted R-squared	0.678096	S.D. dependent var		0.399967
S.E. of regression	0.226928	Akaike info criterion		-0.054568
Sum squared resid	1.853861	Schwarz criterion		0.073398
Log likelihood	4.064074	F-statistic		41.02378
Durbin-Watson stat	1.994631	Prob(F-statistic)		0.000000

INF @ LEVEL

ADF Test Statistic	-4.342622	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INF)

Method: Least Squares

Date: 02/18/14 Time: 13:35

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.717441	0.165209	-4.342622	0.0001
D(INF(-1))	0.300114	0.157124	1.910050	0.0639
C	1.919745	0.456300	4.207203	0.0002
R-squared	0.339884	Mean dependent var	-0.009826	
Adjusted R-squared	0.304202	S.D. dependent var	0.787047	
S.E. of regression	0.656511	Akaike info criterion	2.068285	
Sum squared resid	15.94726	Schwarz criterion	2.194951	
Log likelihood	-38.36570	F-statistic	9.525368	
Durbin-Watson stat	1.747053	Prob(F-statistic)	0.000460	

GCF @ LEVEL

ADF Test Statistic	-1.946810	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GCF)

Method: Least Squares

Date: 02/18/14 Time: 13:37

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GCF(-1)	-0.269803	0.138587	-1.946810	0.0592
D(GCF(-1))	-0.232948	0.164877	-1.412857	0.1661
C	2.655797	1.285416	2.066099	0.0459
R-squared	0.221706	Mean dependent var	0.147875	
Adjusted R-squared	0.179636	S.D. dependent var	2.036369	
S.E. of regression	1.844419	Akaike info criterion	4.134244	
Sum squared resid	125.8696	Schwarz criterion	4.260910	
Log likelihood	-79.68489	F-statistic	5.269946	
Durbin-Watson stat	2.202112	Prob(F-statistic)	0.009686	

GCF @ 1ST DIFF

ADF Test Statistic	-8.681226	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GCF,2)

Method: Least Squares

Date: 02/18/14 Time: 13:38

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GCF(-1))	-2.094698	0.241291	-8.681226	0.0000
D(GCF(-1),2)	0.515979	0.145079	3.556549	0.0011
C	0.368647	0.274213	1.344382	0.1872
R-squared	0.767533	Mean dependent var	-0.035172	
Adjusted R-squared	0.754618	S.D. dependent var	3.406828	
S.E. of regression	1.687607	Akaike info criterion	3.958304	
Sum squared resid	102.5286	Schwarz criterion	4.086270	
Log likelihood	-74.18692	F-statistic	59.43037	
Durbin-Watson stat	2.151887	Prob(F-statistic)	0.000000	

DR @ LEVEL

ADF Test Statistic	0.031552	1% Critical Value*	-3.6171
		5% Critical Value	-2.9422
		10% Critical Value	-2.6092

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DR)

Method: Least Squares

Date: 02/18/14 Time: 13:39

Sample(adjusted): 1972 2011

Included observations: 37

Excluded observations: 3 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DR(-1)	0.001953	0.061899	0.031552	0.9750
D(DR(-1))	-0.018330	0.188951	-0.097008	0.9233
C	-0.029941	0.120583	-0.248304	0.8054
R-squared	0.000278	Mean dependent var	-0.026056	
Adjusted R-squared	-0.058529	S.D. dependent var	0.221176	
S.E. of regression	0.227556	Akaike info criterion	-0.045235	
Sum squared resid	1.760581	Schwarz criterion	0.085380	
Log likelihood	3.836848	F-statistic	0.004728	
Durbin-Watson stat	1.901674	Prob(F-statistic)	0.995284	

DR @ 1ST DIFF

ADF Test Statistic	-2.951926	1% Critical Value*	-3.6289
		5% Critical Value	-2.9472
		10% Critical Value	-2.6118

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DR,2)

Method: Least Squares

Date: 02/18/14 Time: 13:40

Sample(adjusted): 1973 2011

Included observations: 35

Excluded observations: 4 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DR(-1))	-0.812049	0.275091	-2.951926	0.0059
D(DR(-1),2)	-0.196452	0.187300	-1.048863	0.3021
C	-0.025496	0.039288	-0.648935	0.5210
R-squared	0.487936	Mean dependent var	-0.004218	
Adjusted R-squared	0.455932	S.D. dependent var	0.312521	
S.E. of regression	0.230519	Akaike info criterion	-0.015154	
Sum squared resid	1.700442	Schwarz criterion	0.118161	
Log likelihood	3.265197	F-statistic	15.24612	
Durbin-Watson stat	2.023238	Prob(F-statistic)	0.000022	

PRIVCR @ LEVEL

ADF Test Statistic	0.040245	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PRIVCR)

Method: Least Squares

Date: 02/18/14 Time: 13:41

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIVCR(-1)	0.000336	0.008351	0.040245	0.9681
D(PRIVCR(-1))	0.272232	0.160607	1.695022	0.0985
C	0.173772	0.099598	1.744734	0.0893
R-squared	0.073141	Mean dependent var	0.247245	
Adjusted R-squared	0.023041	S.D. dependent var	0.150179	
S.E. of regression	0.148439	Akaike info criterion	-0.905253	
Sum squared resid	0.815258	Schwarz criterion	-0.778587	
Log likelihood	21.10505	F-statistic	1.459894	
Durbin-Watson stat	1.783412	Prob(F-statistic)	0.245329	

PRIVCR @ 1ST DIFF

ADF Test Statistic	-4.499841	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PRIVCR,2)

Method: Least Squares

Date: 02/18/14 Time: 13:42

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PRIVCR(-1))	-0.900015	0.200010	-4.499841	0.0001
D(PRIVCR(-1),2)	0.254510	0.162636	1.564904	0.1264
C	0.225511	0.056241	4.009717	0.0003
R-squared	0.385114	Mean dependent var	-0.003566	
Adjusted R-squared	0.350954	S.D. dependent var	0.179531	
S.E. of regression	0.144636	Akaike info criterion	-0.955388	
Sum squared resid	0.753106	Schwarz criterion	-0.827422	
Log likelihood	21.63007	F-statistic	11.27373	
Durbin-Watson stat	2.068040	Prob(F-statistic)	0.000158	

USIRD @ LEVEL

ADF Test Statistic	-2.056420	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(USIRD)

Method: Least Squares

Date: 02/18/14 Time: 13:43

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
USIRD(-1)	-0.214803	0.104455	-2.056420	0.0468
D(USIRD(-1))	0.024122	0.150434	0.160350	0.8735
C	0.408726	0.220226	1.855942	0.0714
R-squared	0.106492	Mean dependent var	0.013283	
Adjusted R-squared	0.058195	S.D. dependent var	0.717416	
S.E. of regression	0.696229	Akaike info criterion	2.185761	
Sum squared resid	17.93517	Schwarz criterion	2.312427	
Log likelihood	-40.71522	F-statistic	2.204913	
Durbin-Watson stat	1.981879	Prob(F-statistic)	0.124543	

USIRD @ 1ST DIFF

ADF Test Statistic	-6.618476	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INTDIFF,2)

Method: Least Squares

Date: 02/18/14 Time: 13:44

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(USIRD(-1))	-1.451133	0.219255	-6.618476	0.0000
D(USIRD(-1),2)	0.345164	0.145286	2.375763	0.0230
C	0.037631	0.111333	0.338003	0.7373
R-squared	0.603046	Mean dependent var	-0.003280	
Adjusted R-squared	0.580993	S.D. dependent var	1.068634	
S.E. of regression	0.691735	Akaike info criterion	2.174575	
Sum squared resid	17.22589	Schwarz criterion	2.302541	
Log likelihood	-39.40422	F-statistic	27.34533	
Durbin-Watson stat	2.179585	Prob(F-statistic)	0.000000	

GOCE @ LEVEL

ADF Test Statistic	-0.132702	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GOCE)

Method: Least Squares

Date: 02/18/14 Time: 13:45

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOCE(-1)	-0.002265	0.017068	-0.132702	0.8951
D(GOCE(-1))	-0.254094	0.162203	-1.566516	0.1257
C	0.283316	0.187148	1.513859	0.1386
R-squared	0.064482	Mean dependent var	0.205460	
Adjusted R-squared	0.013913	S.D. dependent var	0.274665	
S.E. of regression	0.272748	Akaike info criterion	0.311499	
Sum squared resid	2.752476	Schwarz criterion	0.438165	
Log likelihood	-3.229971	F-statistic	1.275133	
Durbin-Watson stat	2.003245	Prob(F-statistic)	0.291386	

GOCE @ 1ST DIFF

ADF Test Statistic	-4.950671	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GOCE,2)

Method: Least Squares

Date: 02/18/14 Time: 13:45

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GOCE(-1))	-1.316237	0.265870	-4.950671	0.0000
D(GOCE(-1),2)	0.047762	0.168966	0.282673	0.7790
C	0.272456	0.071217	3.825743	0.0005
R-squared	0.622064	Mean dependent var	-0.007353	
Adjusted R-squared	0.601068	S.D. dependent var	0.437379	
S.E. of regression	0.276254	Akaike info criterion	0.338808	
Sum squared resid	2.747377	Schwarz criterion	0.466775	
Log likelihood	-3.606761	F-statistic	29.62711	
Durbin-Watson stat	1.972369	Prob(F-statistic)	0.000000	

ECM @ LEVEL

ADF Test Statistic	-3.933229	1% Critical Value*	-3.6171
		5% Critical Value	-2.9422
		10% Critical Value	-2.6092

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM)

Method: Least Squares

Date: 02/18/14 Time: 13:46

Sample(adjusted): 1972 2011

Included observations: 37

Excluded observations: 3 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.867397	0.220530	-3.933229	0.0004
D(ECM(-1))	0.132838	0.176518	0.752547	0.4569
C	-0.030030	0.168096	-0.178647	0.8593
R-squared	0.380467	Mean dependent var	0.025901	
Adjusted R-squared	0.344024	S.D. dependent var	1.257739	
S.E. of regression	1.018673	Akaike info criterion	2.952483	
Sum squared resid	35.28161	Schwarz criterion	3.083098	
Log likelihood	-51.62094	F-statistic	10.44001	
Durbin-Watson stat	1.954644	Prob(F-statistic)	0.000292	

OVER PARAMETIZED ECM FOR MODEL 1B

Dependent Variable: D(KFM,2)

Method: Least Squares

Date: 02/18/14 Time: 13:52

Sample(adjusted): 1973 2011

Included observations: 35

Excluded observations: 4 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KFM(-1),2)	-0.296670	0.124142	-2.389769	0.0287
D(EXTDEBT,2)	0.407838	0.112662	3.620029	0.0021
D(EXTDEBT(-1),2)	0.142340	0.103164	1.379748	0.1855
D(DOP,2)	-2.525752	0.989287	-2.553103	0.0206
D(DOP(-1),2)	-2.306569	0.960885	-2.400463	0.0281
D(INF,2)	0.372836	0.262252	1.421671	0.1732
D(INF(-1),2)	-0.351650	0.309168	-1.137408	0.2711
D(GCF,2)	-0.102316	0.074613	-1.371298	0.1881
D(GCF(-1),2)	0.117949	0.088729	1.329319	0.2013
D(DR,2)	0.364575	0.970312	0.375730	0.7118
D(DR(-1),2)	1.774326	1.151708	1.540603	0.1418
D(PRIVCR,2)	-1.942842	1.929214	-1.007064	0.3280
D(PRIVCR(-1),2)	-3.671129	1.835121	-2.000483	0.0617
D(USIRD,2)	0.626482	0.303848	2.061826	0.0549
D(USIRD(-1),2)	0.201748	0.286358	0.704529	0.4906
D(GOCE,2)	1.059232	1.181667	0.896388	0.3826
D(GOCE(-1),2)	-0.274093	0.879277	-0.311726	0.7590
ECM(-1)	-1.064011	0.201494	-5.280620	0.0001
R-squared	0.928954	Mean dependent var		0.061694
Adjusted R-squared	0.857907	S.D. dependent var		2.645017
S.E. of regression	0.997044	Akaike info criterion		3.138394
Sum squared resid	16.89966	Schwarz criterion		3.938287
Log likelihood	-36.92189	Durbin-Watson stat		1.257679

PASSIMONIOUS ECM FOR MODEL 1B

Dependent Variable: D(KFM,2)

Method: Least Squares

Date: 02/18/14 Time: 13:57

Sample(adjusted): 1973 2011

Included observations: 36

Excluded observations: 3 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT,2)	0.262969	0.086956	3.024167	0.0054
D(DOP,2)	0.034053	0.730133	0.046640	0.9631
D(INF,2)	0.100925	0.208266	0.484599	0.6319
D(GCF,2)	-0.048238	0.068629	-0.702876	0.4881
D(DR(-1),2)	0.592191	0.793468	0.746333	0.4619
D(PRIVCR(-1),2)	-1.998049	1.597741	-1.250547	0.2218
D(USIRD,2)	0.403307	0.278648	1.447371	0.1593
D(GOCE,2)	0.920045	0.781819	1.176800	0.2495
ECM(-1)	-1.522111	0.226557	-6.718456	0.0000
R-squared	0.805508	Mean dependent var		0.044053
Adjusted R-squared	0.747880	S.D. dependent var		2.609105
S.E. of regression	1.310072	Akaike info criterion		3.590359
Sum squared resid	46.33977	Schwarz criterion		3.986238
Log likelihood	-55.62646	Durbin-Watson stat		1.868760

APPENDIX A4

RESULTS OF ANALYSES FOR MODEL 2A (WORLD BANK & ERBE 1986 ESTIMATES)

Dependent Variable: GDP

Method: Least Squares

Date: 02/22/14 Time: 07:25

Sample: 1970 2011

Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXDEBT	0.060261	0.028090	2.145280	0.0386
DFI	0.613180	0.062872	9.752797	0.0000
CAB	0.151818	0.057116	2.658075	0.0115
RES	0.198151	0.061219	3.236736	0.0026
C	2.831836	0.340462	8.317620	0.0000
R-squared	0.980398	Mean dependent var	12.99879	
Adjusted R-squared	0.978279	S.D. dependent var	2.778640	
S.E. of regression	0.409521	Akaike info criterion	1.163689	
Sum squared resid	6.205190	Schwarz criterion	1.370554	
Log likelihood	-19.43746	F-statistic	462.6337	
Durbin-Watson stat	1.752369	Prob(F-statistic)	0.000000	

ECM

0.000499
0.004597
-0.419627
0.126799
-0.615467
0.522938
0.421136
0.357743
-0.268965
-0.016234
-0.099215
-0.325306
-0.552178
-0.043477
0.542729
0.011477
-0.338683
0.179375
0.184404
-0.180071
-0.272138
0.182126
-0.125531
-0.551001
-0.283573
0.001712
-0.188216
0.050148
0.022303
-0.335910
-0.288214
0.354140
0.572656
0.717109
0.044559
-0.030133
0.100902

0.629342
0.244129
0.944592
-0.924740
-0.356733

CORRELATION MATRIX FOR MODEL 2A

GDP	EXDEBT	DFI	CAB	RES
1.000000	0.838584	0.964968	0.947727	0.937394
0.838584	1.000000	0.779747	0.783694	0.818715
0.964968	0.779747	1.000000	0.892047	0.862185
0.947727	0.783694	0.892047	1.000000	0.936287
0.937394	0.818715	0.862185	0.936287	1.000000

ECM UNIT ROOT FOR MODEL 2A

Null Hypothesis: ECM has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.498625	0.0000
Test critical values: 1% level	-3.600987	
5% level	-2.935001	
10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM)

Method: Least Squares

Date: 02/22/14 Time: 07:46

Sample(adjusted): 1971 2011

Included observations: 41 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.884001	0.160768	-5.498625	0.0000
C	-0.001021	0.061899	-0.016502	0.9869
R-squared	0.436700	Mean dependent var		-0.008713
Adjusted R-squared	0.422257	S.D. dependent var		0.521313
S.E. of regression	0.396247	Akaike info criterion		1.033991
Sum squared resid	6.123448	Schwarz criterion		1.117580
Log likelihood	-19.19682	F-statistic		30.23488
Durbin-Watson stat	1.972605	Prob(F-statistic)		0.000003

COINTEGRATION TEST FOR MODEL 2A

Test
assumption:
Linear
deterministic
trend in the
data
Series: GDP EXTDEBT DFI CAB RES
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.474747	70.40447	68.52	76.07	None *
0.441328	44.64948	47.21	54.46	At most 1
0.283674	21.36175	29.68	35.65	At most 2
0.170620	8.016926	15.41	20.04	At most 3
0.013257	0.533835	3.76	6.65	At most 4

*(**) denotes
rejection of the
hypothesis at
5%(1%)
significance
level
L.R. test
indicates 1
cointegrating
equation(s) at
5%
significance
level

Unnormalized Cointegrating Coefficients:

GDP	EXTDEBT	DFI	CAB	RES
-0.472886	-0.018627	0.376883	-0.082748	0.281538
0.396133	-0.011821	-0.200812	-0.216378	0.043299
0.222169	-0.078857	-0.193458	0.030398	-0.002299
0.175721	0.040636	-0.316255	0.035997	0.004613
-0.134482	-0.015090	0.334638	0.005619	-0.051778

Normalized
Cointegrating
Coefficients: 1
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	C
1.000000	0.039389 (0.03457)	-0.796985 (0.10911)	0.174985 (0.10106)	-0.595361 (0.12391)	-1.406198

Log likelihood -210.7416

Normalized
Cointegrating
Coefficients: 2
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	C
1.000000	0.000000	-0.631954	-0.235358	-0.194431	-2.415921

		(0.12710)	(0.29026)	(0.27206)	
0.000000	1.000000	-4.189744	10.41764	-10.17865	25.63447
		(3.52478)	(8.04961)	(7.54497)	

Log likelihood -199.0978

Normalized
Cointegrating
Coefficients: 3
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	C
1.000000	0.000000	0.000000	-1.725541	1.061015	-5.862785
			(0.95693)	(1.06814)	
0.000000	1.000000	0.000000	0.537991	-1.855275	2.782375
			(2.11231)	(2.35780)	
0.000000	0.000000	1.000000	-2.358055	1.986608	-5.454294
			(1.34304)	(1.49913)	

Log likelihood -192.4254

Normalized
Cointegrating
Coefficients: 4
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	C
1.000000	0.000000	0.000000	0.000000	-1.040892	-3.262174
				(0.14680)	
0.000000	1.000000	0.000000	0.000000	-1.199940	1.971554
				(0.27121)	
0.000000	0.000000	1.000000	0.000000	-0.885773	-1.900403
				(0.19190)	
0.000000	0.000000	0.000000	1.000000	-1.218115	1.507128
				(0.11249)	

Log likelihood -188.6838

OVERPARAMETIZED ECM (ECM1) FOR MODEL 2A

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/22/14 Time: 10:18

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.001263	0.002219	0.569088	0.5737
D(EXDEBT,2)	0.033810	0.009991	3.384023	0.0021
D(EXDEBT(-1),2)	0.006862	0.009622	0.713097	0.4815
D(DFI,2)	0.121590	0.068377	1.778235	0.0859
D(DFI(-1),2)	-0.049764	0.072732	-0.684206	0.4993
D(CAB,2)	0.039083	0.015798	2.473946	0.0195
D(CAB(-1),2)	-0.012220	0.014623	-0.835679	0.4102
D(RES,2)	0.053470	0.018522	2.886919	0.0073
D(RES(-1),2)	0.015641	0.018576	0.841989	0.4067
ECM(-1)	-0.356701	0.119944	-2.973910	0.0059

R-squared 0.618897 Mean dependent var 0.000564

Adjusted R-squared	0.500624	S.D. dependent var	0.252172
S.E. of regression	0.178202	Akaike info criterion	-0.395248
Sum squared resid	0.920918	Schwarz criterion	0.031306
Log likelihood	17.70734	Durbin-Watson stat	2.146693

PASSIMONIOUS ECM (ECM2) FOR MODEL 2A

Dependent Variable: D(EXDEBT(-1),2)

Method: Least Squares

Date: 02/22/14 Time: 10:42

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1),2)	-0.479119	1.205027	-0.397600	0.6933
D(CAB(-1),2)	-0.234175	0.221241	-1.058460	0.2971
D(RES(-1),2)	0.438762	0.285467	1.536995	0.1333
ECM(-1)	0.307254	1.764498	0.174131	0.8628
R-squared	0.073753	Mean dependent var	-0.037285	
Adjusted R-squared	-0.005640	S.D. dependent var	3.792771	
S.E. of regression	3.803451	Akaike info criterion	5.606609	
Sum squared resid	506.3185	Schwarz criterion	5.777231	
Log likelihood	-105.3289	Durbin-Watson stat	3.054369	

APPENDIX A5

RESULTS OF ANALYSES FOR MODEL 2B (MORGAN GUARANTY TRUST (1986) ESTIMATES

OLS RESULT

Dependent Variable: GDP

Method: Least Squares

Date: 02/17/14 Time: 16:22

Sample: 1970 2011

Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.836515	0.347164	8.170538	0.0000
EXTDEBT	0.059176	0.029798	1.985894	0.0547
DFI	0.611646	0.064928	9.420443	0.0000
CAB	0.149739	0.060295	2.483446	0.0178
RES	0.194025	0.070490	2.752518	0.0092
NEXTAS	0.008570	0.069472	0.123354	0.9025
R-squared	0.980406	Mean dependent var	12.99879	
Adjusted R-squared	0.977685	S.D. dependent var	2.778640	
S.E. of regression	0.415083	Akaike info criterion	1.210885	
Sum squared resid	6.202568	Schwarz criterion	1.459124	
Log likelihood	-19.42859	F-statistic	360.2594	
Durbin-Watson stat	1.739756	Prob(F-statistic)	0.000000	

ECM

Last updated:

02/17/14 -

16:27

Modified:

1970 2011 //
 makesresid

0.001798
 -0.005001
 -0.410493
 0.116360
 -0.623827
 0.532815
 0.436430
 0.354594
 -0.271251
 -0.022187
 -0.103721
 -0.329114
 -0.550350
 -0.038345
 0.537781
 0.021352
 -0.346471
 0.177713
 0.175173
 -0.181776
 -0.272749
 0.179806
 -0.122077
 -0.548534
 -0.270966
 -0.000447
 -0.187914
 0.076240
 0.035796
 -0.340345
 -0.291853
 0.356747
 0.579989
 0.718902
 0.040470
 -0.030942
 0.097564
 0.623438
 0.245885
 0.927582
 -0.924806
 -0.363269

CORRELATION MATRIX FOR MODEL 2B

GDP	EXDEBT	DFI	CAB	RES	NEXTAS
1.000000	0.838584	0.964968	0.947727	0.937394	0.935417
0.838584	1.000000	0.779747	0.783694	0.818715	0.838219
0.964968	0.779747	1.000000	0.892047	0.862185	0.880397
0.947727	0.783694	0.892047	1.000000	0.936287	0.930167
0.937394	0.818715	0.862185	0.936287	1.000000	0.944695
0.935417	0.838219	0.880397	0.930167	0.944695	1.000000

UNIT ROOT TEST FOR MODEL 2B

GDP @ LEVEL

ADF Test Statistic	-0.200491	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP)

Method: Least Squares

Date: 02/17/14 Time: 16:29

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.002279	0.011366	-0.200491	0.8422
D(GDP(-1))	0.079925	0.165028	0.484313	0.6310
C	0.228062	0.152734	1.493196	0.1439
R-squared	0.007062	Mean dependent var		0.215963
Adjusted R-squared	-0.046610	S.D. dependent var		0.184590
S.E. of regression	0.188843	Akaike info criterion		-0.423767
Sum squared resid	1.319476	Schwarz criterion		-0.297101
Log likelihood	11.47535	F-statistic		0.131574
Durbin-Watson stat	1.972218	Prob(F-statistic)		0.877123

GDP @ 1ST DIFF

ADF Test Statistic	C	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 16:46

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.922684	0.225293	-4.095477	0.0002
D(GDP(-1),2)	0.001833	0.167001	0.010976	0.9913
C	0.202579	0.057756	3.507505	0.0012
R-squared	0.461602	Mean dependent var		0.000564
Adjusted R-squared	0.431691	S.D. dependent var		0.252172
S.E. of regression	0.190103	Akaike info criterion		-0.408694
Sum squared resid	1.301014	Schwarz criterion		-0.280728
Log likelihood	10.96954	F-statistic		15.43252
Durbin-Watson stat	1.992171	Prob(F-statistic)		0.000014

EXTDEBT @ LEVEL

ADF Test Statistic	-2.201592	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT)

Method: Least Squares

Date: 02/17/14 Time: 16:49

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTDEBT(-1)	-0.188125	0.085450	-2.201592	0.0340
D(EXTDEBT(-1))	-0.299084	0.146248	-2.045049	0.0480
C	2.103002	0.848483	2.478544	0.0179
R-squared	0.228160	Mean dependent var		0.274691
Adjusted R-squared	0.186439	S.D. dependent var		2.270709
S.E. of regression	2.048126	Akaike info criterion		4.343766
Sum squared resid	155.2083	Schwarz criterion		4.470432
Log likelihood	-83.87531	F-statistic		5.468688
Durbin-Watson stat	2.246333	Prob(F-statistic)		0.008303

EXTDEBT @ 1ST DIFF

ADF Test Statistic	-8.348753	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT,2)

Method: Least Squares

Date: 02/17/14 Time: 16:52

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT(-1))	-1.969770	0.235936	-8.348753	0.0000
D(EXTDEBT(-1),2)	0.437732	0.143023	3.060567	0.0042
C	0.470617	0.311519	1.510716	0.1396
R-squared	0.760957	Mean dependent var		-0.063611
Adjusted R-squared	0.747677	S.D. dependent var		3.783674
S.E. of regression	1.900607	Akaike info criterion		4.196027
Sum squared resid	130.0430	Schwarz criterion		4.323993
Log likelihood	-78.82252	F-statistic		57.30026
Durbin-Watson stat	2.172098	Prob(F-statistic)		0.000000

DFI @ LEVEL

ADF Test Statistic	1.269495	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI)

Method: Least Squares

Date: 02/17/14 Time: 16:52

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFI(-1)	0.052234	0.041146	1.269495	0.2122
D(DFI(-1))	-0.109556	0.177206	-0.618242	0.5402
C	-0.282496	0.411621	-0.686301	0.4968
R-squared	0.041967	Mean dependent var		0.224591
Adjusted R-squared	-0.009819	S.D. dependent var		0.500320
S.E. of regression	0.502770	Akaike info criterion		1.534670
Sum squared resid	9.352769	Schwarz criterion		1.661336
Log likelihood	-27.69340	F-statistic		0.810392
Durbin-Watson stat	2.001199	Prob(F-statistic)		0.452420

DFI @ 1ST DIFF

ADF Test Statistic	-2.212433	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI,2)

Method: Least Squares

Date: 02/17/14 Time: 16:55

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1))	-0.943529	0.426467	-2.212433	0.0334
D(DFI(-1),2)	-0.072115	0.395325	-0.182419	0.8563
C	0.218228	0.109989	1.984079	0.0549
R-squared	0.507947	Mean dependent var		-0.000601
Adjusted R-squared	0.480611	S.D. dependent var		0.722052
S.E. of regression	0.520373	Akaike info criterion		1.605263
Sum squared resid	9.748384	Schwarz criterion		1.733229
Log likelihood	-28.30263	F-statistic		18.58142
Durbin-Watson stat	1.997457	Prob(F-statistic)		0.000003

DFI @ 2ND DIFF

ADF Test Statistic	-5.608828	1% Critical Value*	-3.6117
		5% Critical Value	-2.9399
		10% Critical Value	-2.6080

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI,3)

Method: Least Squares

Date: 02/17/14 Time: 16:56

Sample(adjusted): 1974 2011

Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1),2)	-2.299893	0.410049	-5.608828	0.0000
D(DFI(-1),3)	0.369399	0.331103	1.115661	0.2722
C	0.069000	0.090345	0.763735	0.4501
R-squared	0.791471	Mean dependent var	-0.074215	
Adjusted R-squared	0.779556	S.D. dependent var	1.174875	
S.E. of regression	0.551622	Akaike info criterion	1.723748	
Sum squared resid	10.65002	Schwarz criterion	1.853031	
Log likelihood	-29.75120	F-statistic	66.42138	
Durbin-Watson stat	2.013554	Prob(F-statistic)	0.000000	

CAB @ LEVEL

ADF Test Statistic	-1.087397	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CAB)

Method: Least Squares

Date: 02/17/14 Time: 17:10

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAB(-1)	-0.079124	0.072765	-1.087397	0.2839
D(CAB(-1))	-0.414512	0.147267	-2.814699	0.0078
C	1.108816	0.753509	1.471536	0.1496
R-squared	0.229456	Mean dependent var	0.216758	
Adjusted R-squared	0.187805	S.D. dependent var	1.736388	
S.E. of regression	1.564865	Akaike info criterion	3.805515	
Sum squared resid	90.60570	Schwarz criterion	3.932181	
Log likelihood	-73.11029	F-statistic	5.509019	
Durbin-Watson stat	2.263756	Prob(F-statistic)	0.008049	

CAB @ 1ST DIFF

ADF Test Statistic	-7.239098	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CAB,2)

Method: Least Squares

Date: 02/17/14 Time: 17:11

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAB(-1))	-1.937014	0.267577	-7.239098	0.0000
D(CAB(-1),2)	0.328639	0.156341	2.102069	0.0426
C	0.444582	0.252137	1.763258	0.0863
R-squared	0.757845	Mean dependent var	-0.018990	
Adjusted R-squared	0.744392	S.D. dependent var	3.000363	
S.E. of regression	1.516914	Akaike info criterion	3.745036	
Sum squared resid	82.83697	Schwarz criterion	3.873002	
Log likelihood	-70.02820	F-statistic	56.33262	
Durbin-Watson stat	2.035611	Prob(F-statistic)	0.000000	

RES @ LEVEL

ADF Test Statistic	-1.637218	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RES)

Method: Least Squares

Date: 02/17/14 Time: 17:12

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES(-1)	-0.113143	0.069107	-1.637218	0.1101
D(RES(-1))	-0.431525	0.149034	-2.895468	0.0063
C	1.346775	0.674417	1.996946	0.0532
R-squared	0.273960	Mean dependent var	0.190868	
Adjusted R-squared	0.234715	S.D. dependent var	1.547590	
S.E. of regression	1.353840	Akaike info criterion	3.515806	
Sum squared resid	67.81668	Schwarz criterion	3.642472	
Log likelihood	-67.31612	F-statistic	6.980700	
Durbin-Watson stat	2.046817	Prob(F-statistic)	0.002678	

RES @ 1 ST DIFF				
ADF Test Statistic	-5.567190	1%	Critical Value*	-3.6067
		5%	Critical Value	-2.9378
		10%	Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RES,2)

Method: Least Squares

Date: 02/17/14 Time: 17:13

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RES(-1))	-1.630233	0.292829	-5.567190	0.0000
D(RES(-1),2)	0.096143	0.171856	0.559438	0.5793
C	0.336489	0.236253	1.424275	0.1630
R-squared	0.723573	Mean dependent var		-0.089793
Adjusted R-squared	0.708216	S.D. dependent var		2.619290
S.E. of regression	1.414863	Akaike info criterion		3.605745
Sum squared resid	72.06610	Schwarz criterion		3.733712
Log likelihood	-67.31203	F-statistic		47.11669
Durbin-Watson stat	1.959867	Prob(F-statistic)		0.000000

NEXTAS @ LEVEL

ADF Test Statistic	-1.390727	1%	Critical Value*	-3.6019
		5%	Critical Value	-2.9358
		10%	Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(NEXTAS)

Method: Least Squares

Date: 02/17/14 Time: 17:13

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEXTAS(-1)	-0.108096	0.077726	-1.390727	0.1726
D(NEXTAS(-1))	-0.125988	0.161384	-0.780672	0.4400
C	1.251634	0.757931	1.651381	0.1071
R-squared	0.079023	Mean dependent var		0.210503
Adjusted R-squared	0.029240	S.D. dependent var		1.565989
S.E. of regression	1.542925	Akaike info criterion		3.777275
Sum squared resid	88.08281	Schwarz criterion		3.903941
Log likelihood	-72.54550	F-statistic		1.587353
Durbin-Watson stat	2.063527	Prob(F-statistic)		0.218075

NEXTAS @ 1ST DIFF

ADF Test Statistic	-8.031390	1% Critical Value*	-3.6067
		5% Critical Value	-2.9378
		10% Critical Value	-2.6069

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(NEXTAS,2)

Method: Least Squares

Date: 02/17/14 Time: 17:14

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NEXTAS(-1))	-1.761366	0.219310	-8.031390	0.0000
D(NEXTAS(-1),2)	0.506762	0.142436	3.557809	0.0011
C	0.448453	0.225792	1.986136	0.0547
R-squared	0.693138	Mean dependent var		0.019413
Adjusted R-squared	0.676090	S.D. dependent var		2.400686
S.E. of regression	1.366304	Akaike info criterion		3.535899
Sum squared resid	67.20432	Schwarz criterion		3.663865
Log likelihood	-65.95003	F-statistic		40.65833
Durbin-Watson stat	2.092632	Prob(F-statistic)		0.000000

ECM @ LEVEL

ADF Test Statistic	-4.155898	1% Critical Value*	-3.6019
		5% Critical Value	-2.9358
		10% Critical Value	-2.6059

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM)

Method: Least Squares

Date: 02/17/14 Time: 17:15

Sample(adjusted): 1972 2011

Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.972906	0.234102	-4.155898	0.0002
D(ECM(-1))	0.101642	0.178345	0.569918	0.5722
C	0.002190	0.064248	0.034083	0.9730
R-squared	0.438357	Mean dependent var		-0.008957
Adjusted R-squared	0.407998	S.D. dependent var		0.525935
S.E. of regression	0.404663	Akaike info criterion		1.100515
Sum squared resid	6.058832	Schwarz criterion		1.227181
Log likelihood	-19.01029	F-statistic		14.43909
Durbin-Watson stat	2.002558	Prob(F-statistic)		0.000023

OVER PARAMETIZED ECM FOR MODEL 2B

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 22:00

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1),2)	-0.183644	0.180833	-1.015549	0.3185
D(EXTDEBT,2)	0.013823	0.012410	1.113800	0.2748
D(EXTDEBT(-1),2)	-0.003551	0.013139	-0.270236	0.7890
D(DFI,2)	0.053507	0.071463	0.748741	0.4603
D(DFI(-1),2)	-0.024731	0.079179	-0.312339	0.7571
D(CAB,2)	0.010828	0.016565	0.653682	0.5186
D(CAB(-1),2)	-0.025658	0.019272	-1.331372	0.1938
D(RES,2)	0.008494	0.025794	0.329296	0.7444
D(RES(-1),2)	0.001341	0.028179	0.047574	0.9624
D(NEXTAS,2)	0.030648	0.022491	1.362635	0.1839
ECM(-1)	-0.629236	0.165242	-4.173481	0.0006
R-squared	0.560372	Mean dependent var		0.000564
Adjusted R-squared	0.403362	S.D. dependent var		0.252172
S.E. of regression	0.194784	Akaike info criterion		-0.201106
Sum squared resid	1.062342	Schwarz criterion		0.268103
Log likelihood	14.92157	Durbin-Watson stat		2.069175

PASSIMONIOUS ECM FOR MODEL 2B

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 22:07

Sample(adjusted): 1973 2011

Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT,2)	0.020282	0.008421	2.408447	0.0216
D(DFI,2)	0.056262	0.047964	1.173008	0.2489
D(CAB(-1),2)	-0.029125	0.010718	-2.717354	0.0103
D(RES,2)	0.021311	0.015646	1.362056	0.1821
ECM(-1)	-0.633854	0.170723	-3.712769	0.0011
R-squared	0.480657	Mean dependent var		0.000564
Adjusted R-squared	0.419558	S.D. dependent var		0.252172
S.E. of regression	0.192122	Akaike info criterion		-0.342164
Sum squared resid	1.254969	Schwarz criterion		-0.128887
Log likelihood	11.67219	Durbin-Watson stat		2.402566

JOHASEN TEST FOR MODEL 2B

Date: 02/17/14 Time: 17:55

Sample: 1970 2011

Included observations: 40

Test

assumption:

Linear

deterministic

trend in the data

Series: GDP EXTDEBT DFI CAB RES NEXTAS

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.560985	95.95913	94.15	103.18	None *

0.457967	63.03029	68.52	76.07	At most 1
0.354636	38.53317	47.21	54.46	At most 2
0.293191	21.01556	29.68	35.65	At most 3
0.153943	7.135782	15.41	20.04	At most 4
0.011163	0.449044	3.76	6.65	At most 5

*(**) denotes
rejection of the
hypothesis at
5%(1%)
significance
level
L.R. test
indicates 1
cointegrating
equation(s) at
5% significance
level

Unnormalized Cointegrating Coefficients:

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS
-0.493226	0.004533	0.276181	0.085223	0.012920	0.131792
0.158521	0.030923	-0.191331	0.195330	-0.223470	-0.052036
0.347913	0.023776	-0.297414	-0.093424	-0.190961	0.163088
-0.282191	0.064978	0.278384	-0.047226	0.082940	-0.060698
0.020714	-0.051027	0.046201	-0.066637	-0.030863	0.069462
0.171304	0.036096	-0.410913	0.024757	0.138371	-0.107871

Normalized
Cointegrating
Coefficients: 1
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	-0.009190 (0.02789)	-0.559950 (0.10539)	-0.172788 (0.07333)	-0.026194 (0.09328)	-0.267205 (0.08679)	-2.762386

Log likelihood -252.2529

Normalized
Cointegrating
Coefficients: 2
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	-0.589059 (0.10671)	-0.109578 (0.18413)	-0.088439 (0.20351)	-0.269952 (0.08243)	-2.567998
0.000000	1.000000	-3.167665 (2.12909)	6.878430 (3.67392)	-6.773344 (4.06058)	-0.298907 (1.64463)	21.15307

Log likelihood -240.0043

Normalized
Cointegrating
Coefficients: 3
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	0.000000	7.403078	-0.117632	-9.336776	2.062183

			(49.1623)	(6.84973)	(53.8375)	
0.000000	1.000000	0.000000	47.27772	-6.930332	-49.05575	46.05186
			(276.657)	(38.5464)	(302.967)	
0.000000	0.000000	1.000000	12.75365	-0.049560	-15.39204	7.860299
			(82.6122)	(11.5103)	(90.4684)	

Log likelihood -231.2455

Normalized
Cointegrating
Coefficients: 4
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	0.000000	0.000000	0.712865	-1.616243	-4.579740
				(0.88149)	(0.89849)	
0.000000	1.000000	0.000000	0.000000	-1.626588	0.249322	3.635039
				(2.06292)	(2.10270)	
0.000000	0.000000	1.000000	0.000000	1.381180	-2.091496	-3.582074
				(1.21991)	(1.24344)	
0.000000	0.000000	0.000000	1.000000	-0.112183	-1.042882	0.897184
				(0.74536)	(0.75973)	

Log likelihood -224.3056

Normalized
Cointegrating
Coefficients: 5
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	0.000000	0.000000	0.000000	-1.107052	-2.664760
					(0.37970)	
0.000000	1.000000	0.000000	0.000000	0.000000	-0.912528	-0.734486
					(0.76614)	
0.000000	0.000000	1.000000	0.000000	0.000000	-1.104937	0.128209
					(0.65308)	
0.000000	0.000000	0.000000	1.000000	0.000000	-1.123012	0.595826
					(0.24427)	
0.000000	0.000000	0.000000	0.000000	1.000000	-0.714287	-2.686314
					(0.43155)	

Log likelihood -220.9623

APPENDIX A6

RESULT OF ANALYSES FOR MODEL 3A WORLD BANK & ERBE 1985 ESTIMATES (PRE-SAP ERA)

Dependent Variable: KFW
Method: Least Squares
Date: 02/18/14 Time: 09:48
Sample: 1970 1985
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.926130	2.888703	1.705309	0.1319
EXTDEBT	0.117314	0.075269	1.558605	0.1631
DOP	-0.239300	1.020242	-0.234552	0.8213
INF	-0.151389	0.208423	-0.726356	0.4912
GCF	0.070704	0.139189	0.507973	0.6271
DR	0.793791	1.591293	0.498834	0.6332
PRIVCR	0.096335	0.595008	0.161905	0.8760
INTDIFF	-0.081020	0.117747	-0.688085	0.5135
GOCE	0.047841	0.369145	0.129599	0.9005
R-squared	0.942069	Mean dependent var		8.174269
Adjusted R-squared	0.875862	S.D. dependent var		0.826556
S.E. of regression	0.291223	Akaike info criterion		0.668864
Sum squared resid	0.593674	Schwarz criterion		1.103445
Log likelihood	3.649089	F-statistic		14.22912
Durbin-Watson stat	1.948549	Prob(F-statistic)		0.001093

APPENDIX A7

RESULT OF ANALYSES FOR MODEL 3B MORGAN GUARANTY TRUST 1986 ESTIMATES (PRE-SAP ERA)

3B PRE SAP (OLS RESULT)
Dependent Variable: KFM
Method: Least Squares
Date: 02/18/14 Time: 14:02
Sample: 1970 1985
Included observations: 15
Excluded observations: 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.259558	8.027666	0.406041	0.6988
EXTDEBT	0.100719	0.188291	0.534909	0.6119
DOP	-1.439851	2.633642	-0.546715	0.6043
INF	-0.300385	0.529018	-0.567816	0.5908
GCF	0.158665	0.347880	0.456092	0.6644
DR	1.558871	4.094313	0.380741	0.7165
PRIVCR	-0.453457	1.492168	-0.303892	0.7715
INTDIFF	-0.165529	0.317158	-0.521915	0.6204
GOCE	0.455421	1.134090	0.401574	0.7019
R-squared	0.762678	Mean dependent var		7.870546
Adjusted R-squared	0.446248	S.D. dependent var		0.975560
S.E. of regression	0.725959	Akaike info criterion		2.481062
Sum squared resid	3.162095	Schwarz criterion		2.905892
Log likelihood	-9.607963	F-statistic		2.410257

Durbin-Watson stat	2.058431	Prob(F-statistic)	0.149897
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APPENDIX A8

RESULT OF ANALYSES FOR MODEL 4A WORLD BANK & ERBE 1985 ESTIMATES (POST-SAP ERA)

DETERMINANTS OF CAPITAL FLIGHT IN THE POST-SAP ERA

OLS RESULT FOR MODEL 4A

Dependent Variable: KFW

Method: Least Squares

Date: 02/18/14 Time: 13:01

Sample: 1987 2011

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.953374	6.274521	0.311318	0.7596
EXTDEBT	0.436002	0.143713	3.033833	0.0079
DOP	0.607809	0.916903	0.662893	0.5168
INF	-0.225469	0.328107	-0.687183	0.5018
GCF	-0.073375	0.106493	-0.689006	0.5007
DR	0.133897	0.991103	0.135099	0.8942
PRIVCR	1.171950	0.847550	1.382751	0.1857
INTDIFF	-0.145371	0.541769	-0.268327	0.7919
GOCE	-0.579585	0.827897	-0.700069	0.4939
R-squared	0.851692	Mean dependent var	13.31938	
Adjusted R-squared	0.777538	S.D. dependent var	1.711771	
S.E. of regression	0.807372	Akaike info criterion	2.683648	
Sum squared resid	10.42958	Schwarz criterion	3.122443	
Log likelihood	-24.54559	F-statistic	11.48545	
Durbin-Watson stat	2.170467	Prob(F-statistic)	0.000025	

APPENDIX A9

RESULT OF ANALYSES FOR MODEL 4B (MORGAN GUARANTY TRUST 1986 ESTIMATES)

DETERMINANTS OF CAPITAL FLIGHT IN THE POST-SAP ERA

OLS RESULT

Dependent Variable: KFM

Method: Least Squares

Date: 02/18/14 Time: 14:05

Sample: 1987 2011

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.188526	10.23610	0.799965	0.4354
EXTDEBT	0.345730	0.234450	1.474641	0.1597
DOP	0.594526	1.495814	0.397460	0.6963
INF	-0.146992	0.535265	-0.274614	0.7871
GCF	0.011961	0.173731	0.068846	0.9460
DR	-0.630047	1.616861	-0.389673	0.7019
PRIVCR	0.933646	1.382672	0.675247	0.5092
INTDIFF	-0.089968	0.883828	-0.101794	0.9202
GOCE	-0.760191	1.350612	-0.562849	0.5813
R-squared	0.626993	Mean dependent var	12.93480	
Adjusted R-squared	0.440490	S.D. dependent var	1.760855	
S.E. of regression	1.317127	Akaike info criterion	3.662495	
Sum squared resid	27.75716	Schwarz criterion	4.101290	

Log likelihood	-36.78119	F-statistic	3.361834
Durbin-Watson stat	1.935708	Prob(F-statistic)	0.018642

APPENDIX A10

RESULT OF ANALYSES FOR MODEL 5A (WORLD BANK & ERBE 1985 ESTIMATES ESTIMATES)

EFFECT OF CAPITAL FLIGHT ON ECONOMIC GROWTH IN THE PRE-SAP ERA

Dependent Variable: GDP
Method: Least Squares
Date: 02/17/14 Time: 18:31
Sample: 1970 1985
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.574726	1.233967	-2.086543	0.0610
EXTDEBT	-0.093313	0.039827	-2.342966	0.0390
DFI	1.493692	0.174456	8.561991	0.0000
CAB	-0.012379	0.034106	-0.362955	0.7235
RES	0.227284	0.039203	5.797596	0.0001
R-squared	0.975072	Mean dependent var	10.13532	
Adjusted R-squared	0.966007	S.D. dependent var	0.858322	
S.E. of regression	0.158250	Akaike info criterion	-0.598980	
Sum squared resid	0.275472	Schwarz criterion	-0.357546	
Log likelihood	9.791842	F-statistic	107.5680	
Durbin-Watson stat	1.125525	Prob(F-statistic)	0.000000	

POST SAP RESULT

Dependent Variable: GDP
Method: Least Squares
Date: 02/17/14 Time: 18:34
Sample: 1987 2011
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.649664	0.726748	5.021913	0.0001
EXTDEBT	0.055595	0.052201	1.065012	0.2996
DFI	0.478791	0.071877	6.661275	0.0000
CAB	0.317518	0.076944	4.126601	0.0005
RES	0.095994	0.080604	1.190937	0.2476
R-squared	0.959437	Mean dependent var	14.90560	
Adjusted R-squared	0.951324	S.D. dependent var	1.825435	
S.E. of regression	0.402739	Akaike info criterion	1.195801	
Sum squared resid	3.243975	Schwarz criterion	1.439576	
Log likelihood	-9.947507	F-statistic	118.2641	
Durbin-Watson stat	1.330589	Prob(F-statistic)	0.000000	

APPENDIX A11

RESULT OF ANALYSES FOR MODEL 5B ((MORGAN GUARANTY TRUST 1986 ESTIMATES (PRE-SAP ERA)

EFFECT OF CAPITAL FLIGHT ON ECONOMIC GROWTH

PRE SAP (OLS)

Dependent Variable: GDP

Method: Least Squares

Date: 02/17/14 Time: 18:00

Sample: 1970 1985

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.467560	1.243782	-1.983916	0.0754
EXTDEBT	-0.087317	0.040469	-2.157627	0.0563
DFI	1.479476	0.175759	8.417658	0.0000
CAB	-0.001759	0.035992	-0.048881	0.9620
RES	0.256220	0.049631	5.162468	0.0004
NEXTAS	-0.044703	0.046719	-0.956860	0.3612
R-squared	0.977163	Mean dependent var	10.13532	
Adjusted R-squared	0.965744	S.D. dependent var	0.858322	
S.E. of regression	0.158860	Akaike info criterion	-0.561586	
Sum squared resid	0.252366	Schwarz criterion	-0.271866	
Log likelihood	10.49269	F-statistic	85.57711	
Durbin-Watson stat	1.211928	Prob(F-statistic)	0.000000	

APPENDIX A12

RESULT OF ANALYSES FOR MODEL 6A (WORLD BANK & ERBE 1985 ES ESTIMATES)

EFFECT OF CAPITAL FLIGHT ON ECONOMIC GROWTH IN THE POST-SAP ERA

OLS RESULT

POST SAP RESULT

Dependent Variable: GDP

Method: Least Squares

Date: 02/17/14 Time: 18:34

Sample: 1987 2011

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.649664	0.726748	5.021913	0.0001
EXTDEBT	0.055595	0.052201	1.065012	0.2996
DFI	0.478791	0.071877	6.661275	0.0000
CAB	0.317518	0.076944	4.126601	0.0005
RES	0.095994	0.080604	1.190937	0.2476
R-squared	0.959437	Mean dependent var	14.90560	
Adjusted R-squared	0.951324	S.D. dependent var	1.825435	
S.E. of regression	0.402739	Akaike info criterion	1.195801	
Sum squared resid	3.243975	Schwarz criterion	1.439576	
Log likelihood	-9.947507	F-statistic	118.2641	
Durbin-Watson stat	1.330589	Prob(F-statistic)	0.000000	

ECM RESULT FOR MODEL 6A

Last updated:

02/17/14 -
18:07
Modified:
1987 2011 //
makersid

0.389977
0.148484
-0.318847
-0.581594
-0.010696
-0.215419
-0.340886
-0.184664
-0.232138
-0.309176
0.206162
-0.044583
0.056552
-0.357526
0.328735
0.826012
0.513905
-0.072306
-0.185634
-0.038665
0.338466
0.271469
0.555067
-0.545537
-0.197154

UNIT ROOT TEST
GDP @ LEVEL

ADF Test Statistic	-1.984437	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP)

Method: Least Squares

Date: 02/17/14 Time: 18:05

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.045246	0.022800	-1.984437	0.0611
D(GDP(-1))	-0.060470	0.214688	-0.281664	0.7811
C	0.934594	0.360462	2.592766	0.0174
R-squared	0.166671	Mean dependent var		0.243399
Adjusted R-squared	0.083339	S.D. dependent var		0.181415
S.E. of regression	0.173691	Akaike info criterion		-0.541972
Sum squared resid	0.603370	Schwarz criterion		-0.393864
Log likelihood	9.232674	F-statistic		2.000069
Durbin-Watson stat	1.995825	Prob(F-statistic)		0.161496

GDP @ 1ST DIFF

ADF Test Statistic	-3.361317	1% Critical Value*	-3.7667
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5% Critical Value	-3.0038
10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 18:08

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.037322	0.308606	-3.361317	0.0033
D(GDP(-1),2)	0.086368	0.226025	0.382116	0.7066
C	0.243472	0.086753	2.806489	0.0113
R-squared	0.489596	Mean dependent var		-0.015649
Adjusted R-squared	0.435869	S.D. dependent var		0.251045
S.E. of regression	0.188556	Akaike info criterion		-0.372716
Sum squared resid	0.675516	Schwarz criterion		-0.223937
Log likelihood	7.099876	F-statistic		9.112698
Durbin-Watson stat	1.926951	Prob(F-statistic)		0.001680

EXTDEBT @ LEVEL

ADF Test Statistic	-3.716193	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT)

Method: Least Squares

Date: 02/17/14 Time: 18:09

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTDEBT(-1)	-1.034406	0.278351	-3.716193	0.0014
D(EXTDEBT(-1))	0.202889	0.214133	0.947490	0.3547
C	12.49269	3.358977	3.719195	0.0014
R-squared	0.465630	Mean dependent var		0.079613
Adjusted R-squared	0.412193	S.D. dependent var		2.322606
S.E. of regression	1.780708	Akaike info criterion		4.113007
Sum squared resid	63.41845	Schwarz criterion		4.261115
Log likelihood	-44.29958	F-statistic		8.713632
Durbin-Watson stat	1.873343	Prob(F-statistic)		0.001899

DFI @ LEVEL

ADF Test Statistic	0.497843	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI)

Method: Least Squares

Date: 02/17/14 Time: 18:10

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFI(-1)	0.055835	0.112154	0.497843	0.6240
D(DFI(-1))	-0.110513	0.264506	-0.417809	0.6805
C	-0.322892	1.278217	-0.252611	0.8031
R-squared	0.013737	Mean dependent var		0.297179
Adjusted R-squared	-0.084889	S.D. dependent var		0.651271
S.E. of regression	0.678351	Akaike info criterion		2.182804
Sum squared resid	9.203202	Schwarz criterion		2.330912
Log likelihood	-22.10224	F-statistic		0.139284
Durbin-Watson stat	1.994125	Prob(F-statistic)		0.870818

DFI @ 1ST DIFF

ADF Test Statistic	-1.686565	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI,2)

Method: Least Squares

Date: 02/17/14 Time: 18:10

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1))	-1.011284	0.599611	-1.686565	0.1080
D(DFI(-1),2)	-0.034399	0.558218	-0.061622	0.9515
C	0.320446	0.189252	1.693221	0.1067
R-squared	0.525400	Mean dependent var		0.008551
Adjusted R-squared	0.475442	S.D. dependent var		0.960343
S.E. of regression	0.695542	Akaike info criterion		2.237872
Sum squared resid	9.191783	Schwarz criterion		2.386650
Log likelihood	-21.61659	F-statistic		10.51686
Durbin-Watson stat	2.012523	Prob(F-statistic)		0.000842

DFI @ 2ND DIFF

ADF Test Statistic	-4.009544	1% Critical Value*	-3.7856
		5% Critical Value	-3.0114
		10% Critical Value	-2.6457

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI,3)

Method: Least Squares

Date: 02/17/14 Time: 18:11

Sample(adjusted): 1991 2011

Included observations: 21 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1),2)	-2.356691	0.587770	-4.009544	0.0008
D(DFI(-1),3)	0.395890	0.483222	0.819273	0.4233

C	0.148838	0.167100	0.890713	0.3848
R-squared	0.795673	Mean dependent var	-0.136793	
Adjusted R-squared	0.772970	S.D. dependent var	1.572659	
S.E. of regression	0.749335	Akaike info criterion	2.392302	
Sum squared resid	10.10705	Schwarz criterion	2.541519	
Log likelihood	-22.11917	F-statistic	35.04707	
Durbin-Watson stat	2.005796	Prob(F-statistic)	0.000001	

CAB @ LEVEL

ADF Test Statistic	-2.733113	1% Critical Value*	-3.7497	
		5% Critical Value	-2.9969	
		10% Critical Value	-2.6381	

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CAB)

Method: Least Squares

Date: 02/17/14 Time: 18:12

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAB(-1)	-0.265258	0.097053	-2.733113	0.0128
D(CAB(-1))	-0.211178	0.187128	-1.128521	0.2725
C	3.670895	1.223176	3.001117	0.0071
R-squared	0.297901	Mean dependent var	0.314475	
Adjusted R-squared	0.227691	S.D. dependent var	1.184592	
S.E. of regression	1.041032	Akaike info criterion	3.039411	
Sum squared resid	21.67497	Schwarz criterion	3.187519	
Log likelihood	-31.95322	F-statistic	4.243008	
Durbin-Watson stat	1.962974	Prob(F-statistic)	0.029106	

CAB @ 1ST DIFF

ADF Test Statistic	-4.025890	1% Critical Value*	-3.7667	
		5% Critical Value	-3.0038	
		10% Critical Value	-2.6417	

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CAB,2)

Method: Least Squares

Date: 02/17/14 Time: 18:12

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAB(-1))	-1.304017	0.323908	-4.025890	0.0007
D(CAB(-1),2)	0.044646	0.208136	0.214502	0.8324
C	0.327452	0.270204	1.211873	0.2404
R-squared	0.661053	Mean dependent var	-0.127410	
Adjusted R-squared	0.625375	S.D. dependent var	1.849533	
S.E. of regression	1.132037	Akaike info criterion	3.212038	
Sum squared resid	24.34865	Schwarz criterion	3.360817	
Log likelihood	-32.33242	F-statistic	18.52799	
Durbin-Watson stat	2.199372	Prob(F-statistic)	0.000034	

RES @ LEVEL

ADF Test Statistic	-2.509373	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RES)

Method: Least Squares

Date: 02/17/14 Time: 18:13

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES(-1)	-0.364963	0.145440	-2.509373	0.0208
D(RES(-1))	-0.427733	0.186945	-2.288013	0.0332
C	4.530893	1.699409	2.666158	0.0148
R-squared	0.444397	Mean dependent var		0.162310
Adjusted R-squared	0.388837	S.D. dependent var		1.705912
S.E. of regression	1.333630	Akaike info criterion		3.534793
Sum squared resid	35.57136	Schwarz criterion		3.682901
Log likelihood	-37.65012	F-statistic		7.998462
Durbin-Watson stat	2.003970	Prob(F-statistic)		0.002803

RES @ 1ST DIFF

ADF Test Statistic	-4.189475	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RES,2)

Method: Least Squares

Date: 02/17/14 Time: 18:14

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RES(-1))	-1.696982	0.405059	-4.189475	0.0005
D(RES(-1),2)	0.093821	0.236687	0.396393	0.6962
C	0.277565	0.337628	0.822102	0.4212
R-squared	0.757837	Mean dependent var		-0.215744
Adjusted R-squared	0.732346	S.D. dependent var		2.905546
S.E. of regression	1.503192	Akaike info criterion		3.779183
Sum squared resid	42.93214	Schwarz criterion		3.927961
Log likelihood	-38.57101	F-statistic		29.72979
Durbin-Watson stat	1.990288	Prob(F-statistic)		0.000001

APPENDIX A13

RESULT OF ANALYSES FOR MODEL 6B (MORGAN GUARANTY TRUST (1986 ES ESTIMATES))

EFFECT OF CAPITAL FLIGHT ON ECONOMIC GROWTH IN THE POST-SAP ERA

POST SAP (OLS)

Dependent Variable: GDP

Method: Least Squares

Date: 02/17/14 Time: 18:03

Sample: 1987 2011

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.896223	0.761416	5.117079	0.0001
EXTDEBT	0.026396	0.058949	0.447786	0.6594
DFI	0.456492	0.074723	6.109136	0.0000
CAB	0.290508	0.080882	3.591736	0.0019
RES	0.061527	0.086757	0.709184	0.4868
NEXTAS	0.094702	0.089734	1.055371	0.3045
R-squared	0.961683	Mean dependent var		14.90560
Adjusted R-squared	0.951599	S.D. dependent var		1.825435
S.E. of regression	0.401598	Akaike info criterion		1.218833
Sum squared resid	3.064339	Schwarz criterion		1.511363
Log likelihood	-9.235413	F-statistic		95.37242
Durbin-Watson stat	1.313706	Prob(F-statistic)		0.000000

ECM FOR MODEL 6B

Last updated:

02/17/14 - 18:07

Modified: 1987

2011 //

makersid

0.389977

0.148484

-0.318847

-0.581594

-0.010696

-0.215419

-0.340886

-0.184664

-0.232138

-0.309176

0.206162

-0.044583

0.056552

-0.357526

0.328735

0.826012

0.513905

-0.072306

-0.185634

-0.038665

0.338466

0.271469

0.555067

-0.545537

-0.197154

UNIT ROOT TEST FOR MODEL 6B

GDP @ LEVEL

ADF Test Statistic	-1.984437	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP)

Method: Least Squares

Date: 02/17/14 Time: 18:05

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.045246	0.022800	-1.984437	0.0611
D(GDP(-1))	-0.060470	0.214688	-0.281664	0.7811
C	0.934594	0.360462	2.592766	0.0174
R-squared	0.166671	Mean dependent var		0.243399
Adjusted R-squared	0.083339	S.D. dependent var		0.181415
S.E. of regression	0.173691	Akaike info criterion		-0.541972
Sum squared resid	0.603370	Schwarz criterion		-0.393864
Log likelihood	9.232674	F-statistic		2.000069
Durbin-Watson stat	1.995825	Prob(F-statistic)		0.161496

GDP @ 1ST DIFF

ADF Test Statistic	-3.361317	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 18:08

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.037322	0.308606	-3.361317	0.0033
D(GDP(-1),2)	0.086368	0.226025	0.382116	0.7066
C	0.243472	0.086753	2.806489	0.0113
R-squared	0.489596	Mean dependent var		-0.015649
Adjusted R-squared	0.435869	S.D. dependent var		0.251045
S.E. of regression	0.188556	Akaike info criterion		-0.372716
Sum squared resid	0.675516	Schwarz criterion		-0.223937
Log likelihood	7.099876	F-statistic		9.112698
Durbin-Watson stat	1.926951	Prob(F-statistic)		0.001680

EXTDEBT @ LEVEL

ADF Test Statistic	-3.716193	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXTDEBT)

Method: Least Squares

Date: 02/17/14 Time: 18:09

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTDEBT(-1)	-1.034406	0.278351	-3.716193	0.0014
D(EXTDEBT(-1))	0.202889	0.214133	0.947490	0.3547
C	12.49269	3.358977	3.719195	0.0014
R-squared	0.465630	Mean dependent var		0.079613
Adjusted R-squared	0.412193	S.D. dependent var		2.322606
S.E. of regression	1.780708	Akaike info criterion		4.113007
Sum squared resid	63.41845	Schwarz criterion		4.261115
Log likelihood	-44.29958	F-statistic		8.713632
Durbin-Watson stat	1.873343	Prob(F-statistic)		0.001899

DFI @ LEVEL

ADF Test Statistic	0.497843	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI)

Method: Least Squares

Date: 02/17/14 Time: 18:10

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFI(-1)	0.055835	0.112154	0.497843	0.6240
D(DFI(-1))	-0.110513	0.264506	-0.417809	0.6805
C	-0.322892	1.278217	-0.252611	0.8031
R-squared	0.013737	Mean dependent var		0.297179
Adjusted R-squared	-0.084889	S.D. dependent var		0.651271
S.E. of regression	0.678351	Akaike info criterion		2.182804
Sum squared resid	9.203202	Schwarz criterion		2.330912
Log likelihood	-22.10224	F-statistic		0.139284
Durbin-Watson stat	1.994125	Prob(F-statistic)		0.870818

DFI @ 1ST DIFF

ADF Test Statistic	-1.686565	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI,2)

Method: Least Squares

Date: 02/17/14 Time: 18:10

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1))	-1.011284	0.599611	-1.686565	0.1080
D(DFI(-1),2)	-0.034399	0.558218	-0.061622	0.9515
C	0.320446	0.189252	1.693221	0.1067
R-squared	0.525400	Mean dependent var		0.008551
Adjusted R-squared	0.475442	S.D. dependent var		0.960343
S.E. of regression	0.695542	Akaike info criterion		2.237872
Sum squared resid	9.191783	Schwarz criterion		2.386650
Log likelihood	-21.61659	F-statistic		10.51686
Durbin-Watson stat	2.012523	Prob(F-statistic)		0.000842

DFI @ 2ND DIFF

ADF Test Statistic	-4.009544	1% Critical Value*	-3.7856
		5% Critical Value	-3.0114
		10% Critical Value	-2.6457

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DFI,3)

Method: Least Squares

Date: 02/17/14 Time: 18:11

Sample(adjusted): 1991 2011

Included observations: 21 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DFI(-1),2)	-2.356691	0.587770	-4.009544	0.0008
D(DFI(-1),3)	0.395890	0.483222	0.819273	0.4233
C	0.148838	0.167100	0.890713	0.3848
R-squared	0.795673	Mean dependent var		-0.136793
Adjusted R-squared	0.772970	S.D. dependent var		1.572659
S.E. of regression	0.749335	Akaike info criterion		2.392302
Sum squared resid	10.10705	Schwarz criterion		2.541519
Log likelihood	-22.11917	F-statistic		35.04707
Durbin-Watson stat	2.005796	Prob(F-statistic)		0.000001

CAB @ LEVEL

ADF Test Statistic	-2.733113	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CAB)

Method: Least Squares

Date: 02/17/14 Time: 18:12

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAB(-1)	-0.265258	0.097053	-2.733113	0.0128
D(CAB(-1))	-0.211178	0.187128	-1.128521	0.2725
C	3.670895	1.223176	3.001117	0.0071
R-squared	0.297901	Mean dependent var		0.314475
Adjusted R-squared	0.227691	S.D. dependent var		1.184592
S.E. of regression	1.041032	Akaike info criterion		3.039411
Sum squared resid	21.67497	Schwarz criterion		3.187519
Log likelihood	-31.95322	F-statistic		4.243008
Durbin-Watson stat	1.962974	Prob(F-statistic)		0.029106

CAB @ 1ST DIFF

ADF Test Statistic	-4.025890	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CAB,2)

Method: Least Squares

Date: 02/17/14 Time: 18:12

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAB(-1))	-1.304017	0.323908	-4.025890	0.0007
D(CAB(-1),2)	0.044646	0.208136	0.214502	0.8324
C	0.327452	0.270204	1.211873	0.2404
R-squared	0.661053	Mean dependent var		-0.127410
Adjusted R-squared	0.625375	S.D. dependent var		1.849533
S.E. of regression	1.132037	Akaike info criterion		3.212038
Sum squared resid	24.34865	Schwarz criterion		3.360817
Log likelihood	-32.33242	F-statistic		18.52799
Durbin-Watson stat	2.199372	Prob(F-statistic)		0.000034

RES @ LEVEL

ADF Test Statistic	-2.509373	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RES)

Method: Least Squares

Date: 02/17/14 Time: 18:13

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES(-1)	-0.364963	0.145440	-2.509373	0.0208
D(RES(-1))	-0.427733	0.186945	-2.288013	0.0332
C	4.530893	1.699409	2.666158	0.0148
R-squared	0.444397	Mean dependent var		0.162310
Adjusted R-squared	0.388837	S.D. dependent var		1.705912
S.E. of regression	1.333630	Akaike info criterion		3.534793
Sum squared resid	35.57136	Schwarz criterion		3.682901
Log likelihood	-37.65012	F-statistic		7.998462
Durbin-Watson stat	2.003970	Prob(F-statistic)		0.002803

RES @ 1ST DIFF

ADF Test Statistic	-4.189475	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RES,2)

Method: Least Squares

Date: 02/17/14 Time: 18:14

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RES(-1))	-1.696982	0.405059	-4.189475	0.0005
D(RES(-1),2)	0.093821	0.236687	0.396393	0.6962
C	0.277565	0.337628	0.822102	0.4212
R-squared	0.757837	Mean dependent var		-0.215744
Adjusted R-squared	0.732346	S.D. dependent var		2.905546
S.E. of regression	1.503192	Akaike info criterion		3.779183
Sum squared resid	42.93214	Schwarz criterion		3.927961
Log likelihood	-38.57101	F-statistic		29.72979
Durbin-Watson stat	1.990288	Prob(F-statistic)		0.000001

NEXTAS @ LEVEL

ADF Test Statistic	-1.842900	1% Critical Value*	-3.7497
		5% Critical Value	-2.9969
		10% Critical Value	-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(NEXTAS)

Method: Least Squares

Date: 02/17/14 Time: 18:15

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEXTAS(-1)	-0.265435	0.144031	-1.842900	0.0802
D(NEXTAS(-1))	0.042638	0.213028	0.200153	0.8434
C	3.264356	1.677552	1.945904	0.0659
R-squared	0.148369	Mean dependent var		0.204022
Adjusted R-squared	0.063206	S.D. dependent var		1.436807
S.E. of regression	1.390659	Akaike info criterion		3.618540
Sum squared resid	38.67864	Schwarz criterion		3.766648
Log likelihood	-38.61321	F-statistic		1.742171
Durbin-Watson stat	1.947476	Prob(F-statistic)		0.200686

NEXTAS @ 1ST DIFF

ADF Test Statistic	-6.746095	1% Critical Value*	-3.7667
		5% Critical Value	-3.0038
		10% Critical Value	-2.6417

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(NEXTAS,2)

Method: Least Squares

Date: 02/17/14 Time: 18:16

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NEXTAS(-1))	-1.760464	0.260960	-6.746095	0.0000
D(NEXTAS(-1),2)	0.634900	0.177620	3.574482	0.0020
C	0.411525	0.263649	1.560886	0.1351
R-squared	0.723087	Mean dependent var		-0.061494
Adjusted R-squared	0.693938	S.D. dependent var		2.145607
S.E. of regression	1.187011	Akaike info criterion		3.306878
Sum squared resid	26.77091	Schwarz criterion		3.455656
Log likelihood	-33.37566	F-statistic		24.80679
Durbin-Watson stat	2.246159	Prob(F-statistic)		0.000005

ECM @ LEVEL				
ADF Test Statistic	-3.259957	1% Critical Value*		-3.7497
		5% Critical Value		-2.9969
		10% Critical Value		-2.6381

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM)

Method: Least Squares

Date: 02/17/14 Time: 18:16

Sample(adjusted): 1989 2011

Included observations: 23 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.849547	0.260601	-3.259957	0.0039
D(ECM(-1))	0.228827	0.224599	1.018826	0.3205
C	-0.012843	0.073732	-0.174179	0.8635
R-squared	0.376277	Mean dependent var		-0.015028
Adjusted R-squared	0.313905	S.D. dependent var		0.424378
S.E. of regression	0.351516	Akaike info criterion		0.867985
Sum squared resid	2.471271	Schwarz criterion		1.016093
Log likelihood	-6.981826	F-statistic		6.032756
Durbin-Watson stat	2.006594	Prob(F-statistic)		0.008911

OVER PARAMETIZED ECM

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 22:14

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1),2)	-0.148490	0.348981	-0.425497	0.6787
D(EXTDEBT,2)	0.032033	0.020830	1.537838	0.1523
D(EXTDEBT(-1),2)	0.003211	0.030288	0.106002	0.9175
D(DFI,2)	0.051163	0.074675	0.685139	0.5074
D(DFI(-1),2)	-0.026236	0.085098	-0.308306	0.7636
D(CAB,2)	0.069881	0.035004	1.996351	0.0712
D(CAB(-1),2)	-0.008337	0.054543	-0.152852	0.8813
D(RES,2)	-0.006408	0.033366	-0.192049	0.8512
D(RES(-1),2)	-0.035490	0.063994	-0.554580	0.5903
D(NEXTAS,2)	0.006925	0.048297	0.143374	0.8886
ECM(-1)	-0.629546	0.165242	-4.173481	0.0006
R-squared	0.704073	Mean dependent var		-0.015649
Adjusted R-squared	0.435048	S.D. dependent var		0.251045
S.E. of regression	0.188693	Akaike info criterion		-0.190533
Sum squared resid	0.391657	Schwarz criterion		0.354988
Log likelihood	13.09586	Durbin-Watson stat		1.872506

PASSIMONIOUS ECM

Dependent Variable: D(GDP,2)

Method: Least Squares

Date: 02/17/14 Time: 22:18

Sample(adjusted): 1990 2011

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT,2)	0.039304	0.010005	3.928356	0.0011
D(DFI,2)	0.048641	0.044182	1.100933	0.2863
D(CAB,2)	0.086991	0.019127	4.548066	0.0003
D(RES(-1),2)	-0.026153	0.016566	-1.578742	0.1328
ECM(-1)	-0.652764	0.170723	-3.712769	0.0011
R-squared	0.698553	Mean dependent var		-0.015649
Adjusted R-squared	0.627624	S.D. dependent var		0.251045
S.E. of regression	0.153194	Akaike info criterion		-0.717506
Sum squared resid	0.398963	Schwarz criterion		-0.469541
Log likelihood	12.89256	Durbin-Watson stat		2.516736

JOHASEN TEST FOR MODEL 6B

Date: 02/19/14 Time: 21:30

Sample: 1987 2011

Included observations: 23

Test assumption:

Linear

deterministic

trend in the data

Series: GDP EXTDEBT DFI CAB RES NEXTAS

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.849806	112.8849	94.15	103.18	None **
0.648669	69.28095	68.52	76.07	At most 1 *
0.632812	45.22235	47.21	54.46	At most 2
0.345955	22.17911	29.68	35.65	At most 3
0.303035	12.41378	15.41	20.04	At most 4
0.163652	4.110334	3.76	6.65	At most 5 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS
-0.455107	0.134054	0.259565	0.086021	-0.190191	0.223893
-0.395672	-0.042791	0.217773	-0.075327	0.377575	-0.003187
0.115674	-0.069983	0.209899	-0.310473	0.057324	0.087416
-0.626466	-0.151803	0.410546	0.146613	-0.057953	0.176058
0.274849	-0.071937	-0.274072	-0.009027	-0.193944	0.221865
-0.341642	0.016318	0.499830	0.133671	-0.210254	0.083351

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
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1.000000	-0.294556 (0.07385)	-0.570337 (0.08302)	-0.189012 (0.06482)	0.417905 (0.12723)	-0.491957 (0.08871)	-1.567038
Log likelihood	-111.3706					

Normalized
Cointegrating
Coefficients: 2
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	-0.555745 (0.12616)	0.088491 (0.13127)	-0.585760 (0.30294)	-0.126226 (0.14044)	-1.264241
0.000000	1.000000	0.049539 (0.47047)	0.942107 (0.48951)	-3.407385 (1.12969)	1.241636 (0.52372)	1.027977

Log likelihood -99.34127

Normalized
Cointegrating
Coefficients: 3
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	0.000000	-0.421472 (0.28534)	-0.812698 (0.47417)	0.251896 (0.24919)	-3.202848
0.000000	1.000000	0.000000	0.987565 (0.63995)	-3.387155 (1.06345)	1.207930 (0.55886)	1.200784
0.000000	0.000000	1.000000	-0.917619 (0.36133)	-0.408349 (0.60044)	0.680388 (0.31554)	-3.488301

Log likelihood -87.81965

Normalized
Cointegrating
Coefficients: 4
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	0.000000	0.000000	-1.753673 (0.70025)	0.496919 (0.50970)	-0.302882
0.000000	1.000000	0.000000	0.000000	-1.182322 (0.72992)	0.633808 (0.53130)	-5.594229
0.000000	0.000000	1.000000	0.000000	-2.457021 (1.03996)	1.213847 (0.75697)	2.825444
0.000000	0.000000	0.000000	1.000000	-2.232596 (0.92771)	0.581352 (0.67527)	6.880575

Log likelihood -82.93698

Normalized
Cointegrating
Coefficients: 5
Cointegrating
Equation(s)

GDP	EXTDEBT	DFI	CAB	RES	NEXTAS	C
1.000000	0.000000	0.000000	0.000000	0.000000	-1.179022 (0.32505)	-1.293747
0.000000	1.000000	0.000000	0.000000	0.000000	-0.496108 (0.29968)	-6.262267
0.000000	0.000000	1.000000	0.000000	0.000000	-1.134266 (0.45236)	1.437172
0.000000	0.000000	0.000000	1.000000	0.000000	-1.552284 (0.43259)	5.619108
0.000000	0.000000	0.000000	0.000000	1.000000	-0.955675	-0.565023

